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# COAL AGE

With Which is Consolidated The Colliery Engineer

DEVOTED TO THE OPERATING, TECHNICAL  
AND BUSINESS PROBLEMS OF THE  
COAL-MINING INDUSTRY

ISSUED WEEKLY

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VOLUME XXVI

---

July 1 to December 31, 1924

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McGRAW-HILL COMPANY, INC.  
10th AVE. AT 36th ST.  
NEW YORK







# COAL AGE

With Which is Consolidated  
The Colliery Engineer

## INDEX TO VOLUME XXVI

July 1 to December 31, 1924

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# COAL AGE

McGraw-Hill Company, Inc.  
James H. McGraw, *President*  
E. J. Mehren, *Vice-President*

Devoted to the Operating, Technical and Business  
Problems of the Coal-Mining Industry

R. Dawson Hall  
*Engineering Editor*

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## High Wages Promote Idleness

IF THE miner got a laborer's pay, he would be willing to accept a laborer's job, but partly because he gets from \$7.50 to \$9 a day the miner sticks to the industry and lies idle when the mines are closed. Lots of men will tell you a miner is as good as a "wood butcher" and therefore entitled to the carpenter's wages. Perhaps, but is the carpenter justified in getting his present pay? Furthermore most of the highly paid carpenters live in a city, have to pay city rents, have to travel long distances to their work and probably in the next few years they will be getting much less than today, for the era of construction has in most places already ended.

## Economy in Rockdusting

THOSE who are purposing to rockdust their mines should look over their mine cars with the intention of making them at least relatively dustproof. Only by keeping coal from falling on the tracks can the cost of rockdusting be kept at a minimum. Whether the roads are rockdusted or not—and who is not going to use rockdust?—it is well to keep the coal dust on the roads at the lowest possible quantity. Those who anticipate difficulty in keeping the required percentage of rock dust on the roads should remember that the sand deposited by the haulage locomotives and ground under the wheels will materially assist in complying with the regulations of the insurance companies. In fact the sand thus distributed has probably already had no little effect in limiting explosions.

## Will Gas Making at Mines Stabilize the Industry?

ACCORDING to the experts who reported on the Buffalo fuel problem, that city requires twenty-four million cubic feet of gas daily during the winter and an average of only about fifteen million cubic feet per day. Using the exact figures of the report the maximum demand averaged over a month would be one and two-thirds times the average for the year. Again comparing the maximum monthly with the minimum monthly demand the ratio would be two and two-thirds.

One cannot see that a demand so fluctuating would do much to correct the seasonal character of the coal industry if the plant were placed at the mine. The colliery that would supply such a line would work six days a week in the winter and two and a quarter in the summer. Not quite a pleasing prospect! The owner who would operate such a mine at full time would have to enter the general market and cut prices drastically.

To be perfectly frank, many of the much lauded industries function as badly or worse than the coal

industry. Authorities deny that fact, of course, and the public believes them, but facts are facts. The world is badly out of joint. The farmer and builder are idle in winter, the miner in summer. Some have two periods of idleness in the year and others have longer rests at greater intervals. But idle periods come to almost all workers, especially if they will not change their tasks. They come to their employers also who cannot change their equipment as readily as a man can change his job. It's just as well the public thinks the coal man is the only seasonal employer; if the public only knew the facts it would lose faith in humanity.

## Progress in Safety

IN THE article by N. G. Alford in this issue is much assurance for the future. He believes that the biggest hazard of the present will be reduced before long by mechanical loading, for roof falls are going to be controlled more effectually when greater speed of extraction is attained. Despite the fact that the cutters and loaders make more noise than hand picks and that the loaders will work on the goaf face instead of from a crosscut in the body of the pillar, he anticipates greater safety. That, of course, remains to be proved.

The conditions which have enabled Col. E. O'Toole to mine pillar coal more safely than room coal may not be universal. "Kettle bottoms" are not found in every mine. Mr. Alford ascribes the safety in pillar drawing in Col. O'Toole's mines to the fact that the kettle bottoms are loose over the pillar whereas in an advancing room they are so tight that they are not noticed. Suddenly in advancing places they lose their hold and fall, whereas in pillars they come down with the coal. A similar condition, however, is not unusual with ordinary drawslate. So perhaps he is right. The drawslate and kettle bottoms will no longer be a big hazard, and the roof proper or the thicker drawslates will not be a menace when the rapidity of extraction is increased.

Rockdusting will defend us against coal-dust explosions and if we can keep our cars coupled at the loading and discharge points we can save both casualty and time losses. Better cars and surer tracks with wheels kept from flattening and grooving will do much to minimize derailments. It is well if this can be done as greater speeds, more machinery and more gas are likely to add to our dangers. Let us hope we may overtake Great Britain in the loss of life per man employed as we have surpassed her per ton mined.

The present need is to keep in constant mind G. B. Butterfield's slogan, "Every mine rockdusted by Oct. 1." If this is to be done, we must be up and doing, for a mine that is operating cannot be properly dusted in a few days, and machinery for the work even if dust is purchased cannot be obtained with promptitude seeing that at present only one or possibly two firms are engaged in its manufacture. As the winter ap-



proaches with its ghastly forebodings, every effort should be made to obtain such machines and do such dusting. Let not another winter be approached with the mines unprepared.

### A Phenomenon or an Illusion?

WE DO not attempt to explain it. Some things are altogether above and beyond us. We cannot hope to tell anyone why coal mining is the "worst functioning industry." It is plainly a phenomenon, an inexplicable fact of nature. The British likewise find it hard to explain; it is puzzling the French. The Germans, who have solved every problem but the value of the mark, also find this problem difficult.

Arnold D. McNair, in a booklet on the British coal situation entitled "The Problem of the Coal Mines," says: "The reason for the frequent crises in the coal industry is the bad organization of that industry," and the next charge is "The principal defect in this organization is that it does not allow the miner to take a more active and more mental part in the industry." Clearly the industry is wrong because the employer and not the employee directs it. Mr. McNair having solved one phenomenon so easily, What is wrong with the coal industry?, let him try and solve the other one, "Why is the coal industry more wrong than any other industry?" There are other industries beside coal that are not directed by employees and in which employees take no part in direction. In fact there are few indeed and those small that are directed from the bench instead of the office. But in none of those cases has the industry been made wrong or worse functioning. Only coal should think it necessary to let brawn direct brains.

Most of the criticism of the coal industry is absolutely true and relatively false. Every essential industry in every clime unless regulated by the government to its minutest detail is sure to be said to function badly. When it is government owned, operated or controlled the public is satisfied through conditions may be worse. The public then is manager and cannot find fault with its own management unless it is glaringly and transparently inefficient and blundering. After all is said the coal industry is not the worst or the worst-functioning industry. It is not a phenomenon we are discussing; it is an illusion. But are not all illusions phenomena?

### Rockefeller Sheds No Tears

JOHN D. cracked his crude oil and made gasoline and a byproduct that he could not sell except as fuel oil. He could not dispose of enough of this byproduct. Still he wept no tears. He sent out his agents to tell how excellent a value the public was overlooking, that oil was better than coal any day, better for this and better for that. He wasn't weeping. He was merchandising.

The coal man weeps. He is worrying about no sale for slack and about the inroads of oil. Let him take after Rockefeller. Let him get all his facts together and sell slack. Maybe then the same jinx will get him that got John D. He sold so much oil that the price went up, and it doesn't pay to use fuel oil any more. He depressed the coal market so much with his oil that it paid the consumer to change his equipment and burn coal.

Get after him as he got after the coal man. Perhaps

his oil will come down from lack of sale and your fine coal will go up by reason of excessive demand, so that once more oil will have a day—a brief day—in the sun.

But shed no tears. It is active, concerted effort that will sell slack. No forebodings, fears, lamentations, prognostications, regrets, none of the many formularies we have been accustomed to use for the cure of the situation will help the sale a jot. Just plain merchandising of an idea and that idea that fine coal with mechanical stokers and medium sized coal on grates will do the work better than oil or coarser coal. Don't rest satisfied with putting a card in the local papers with your name and address and the name of the mine or region from which your coal comes. Try to sell an idea—the idea you want, the idea the consumer wants.

You couldn't convert the African to the value of ice by sending over a business directory. To get anywhere you would have to sell the idea of using ice to these gentlemen of color. It's the same with fine coal. The consumer knows what it is and doesn't want it, till he is told why he should want it, the labor it saves, the service it renders, the price it is sold for. Sell him individually and collectively the idea of the economical use of fine coal, and all the problems of merchandising and operation will be solved except that a crusher may soon have to be purchased at your mine.

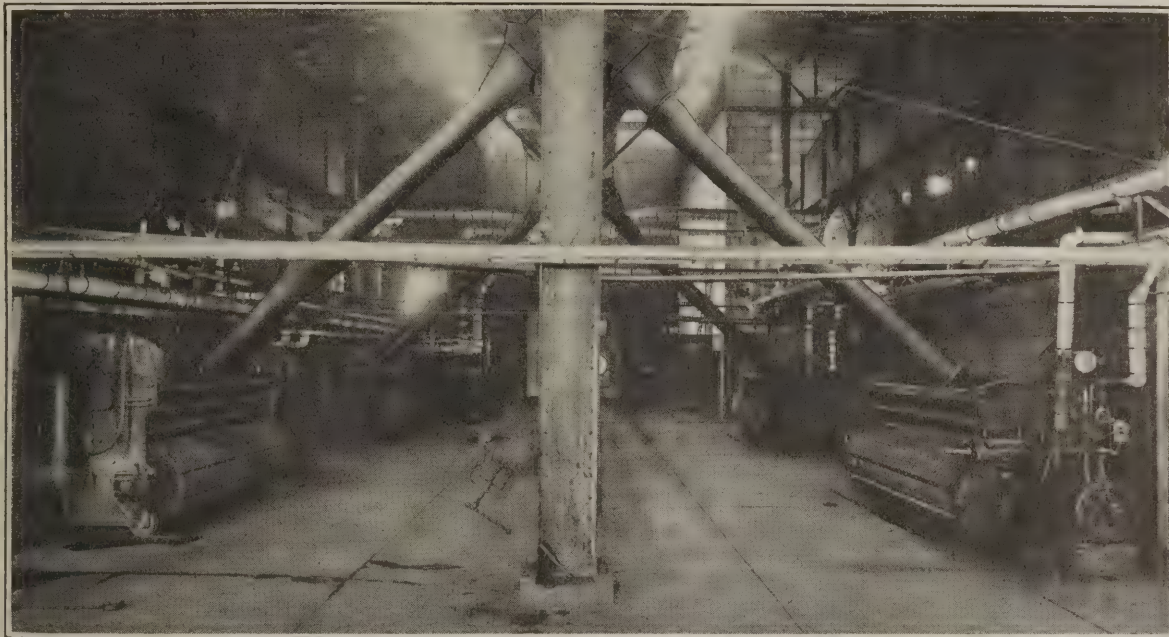
### Arguments for Unionism

A FEW weeks back a coal operator obtained a contract from a railroad company by ruthlessly underbidding his competitors. The price he set for his coal was \$1.50 a ton. No sooner had he obtained the contract than he went down to the mines and notified his employees that the price for which he had sold his coal would not permit him to pay them the former rate of wages. They must accept a reduction of one-third in the wage scale. The employees accepted the wage cut and continued at work.

This kind of cut-throat competition is making operation difficult for companies who desire to use their men fairly and is reducing the wages of mine workers below the cost of even the most frugal living. No wonder that operators have at times advocated unionism arguing that such unfair competition was making the operating of coal mines an industry in which few well-meaning men would care to engage. Such behavior has convinced some operators and is fast convincing others that the beneficence of the employer is not a sufficient pledge that mine workers will receive honorable treatment. Not many men are disposed to conduct their business in that manner, of that we may be sure, but what of that? With a few men playing their hand so unfairly it becomes increasingly necessary for all their competitors to be equally callous as to the needs of their employees and to ask their men to consent to receive wages which their employer knows is below their needs and deserts and not in accord with the best business ethics.

Many times in the past has competition in the reduction of wages argued effectively for unionism and for its recognition by employers. Beware lest it argue again and so forcibly that the expression the "Solid South" will be applied to its unionism instead of its politics.





Interior of Boiler Room, Donk Mine No. 4

## Illinois Mine Generates Own Power Cheaply

All Pickings and Some Slack Burned—Superheated Steam Used—Exhaust from Hoist and Auxiliaries Utilized in Mixed-Pressure Turbine—Costs Reduced to 1.6 Cents per Kilowatt-Hour with Plant at Half Capacity

BY ANDREWS ALLEN AND H. F. HEBLEY  
Chicago, Ill.

SO MANY mines nowadays are operated on current purchased from a central station that it is a matter of considerable interest that a sizable operation, such as the No. 4 mine of the Donk Bros. Coal & Coke Co., in Madison County, Illinois, lying within easy reach of central-station power, is deliberately equipped with a generating plant of its own.

The decision to generate, rather than to purchase, power was made when the designs for this plant first were formulated. This was back in 1918 and 1919, when the power service in that field was subject to many interruptions. But it was reaffirmed far more recently, even though many improvements had been made meanwhile in central stations and in the service they render. This mine and its power plant were completed only last winter, but the mine had been operated since 1921, the hoisting capacity of the original equipment having been only 2,000 tons per day. At present, the mine can produce 3,500 tons of coal daily and has a hoisting capacity of 6,000 tons.

Since the original or partial installation was completed, there has been ample opportunity to study the conditions existing. It was, however, decided to follow

the power policy originally adopted and to operate the mine from an individual steam plant. In the meanwhile, one of the other mines of this company had been worked out and still another had been sold, leaving one good-sized property—No. 2 mine—still operating in addition to the new No. 4 development. The No. 2 mine has been partially electrified and is operating on current from No. 4.

### SPECIALLY DESIGNED PLANT GENERATES CHEAPLY

It was believed that a power plant designed especially for mining conditions and equipped to burn mine refuse, could produce power cheaper than it could be purchased. The results obtained up to the present time on partial tonnage bear out this conclusion. The general design of the plant, as described in *Coal Age*, of June 9, 1921, has been followed with certain minor improvements and modifications, which will be described.

The relative economies of a steam hoisting engine and an electric hoist at No. 4 mine were carefully considered from every possible angle. It was found that the power cost would be slightly in favor of the electric hoist and that the water requirements of the plant would be lessened by it, but the initial investment entailed by an electric hoist would be greater. It was, therefore, decided to install a steam hoist using a regenerator and a mixed-pressure turbine as a means of utilizing the exhaust steam from the hoist.

A compact and economical arrangement was obtained

NOTE—An article by the same authors describing the bottom and surface works of this mine appeared in *Coal Age* of June 26, 1924. The headpiece illustrates the eight horizontal return-tubular boilers in the Donk No. 4 boiler room. These are set in four batteries. Each battery is fired by one stoker. The large water capacity of this type of boiler guards against the heavy fluctuations of pressure caused by the intermittent operation of the hoisting engines.



by locating the main hoisting engines in the northwest corner of the boiler house in a space opposite that occupied by the boiler auxiliaries and the regenerator, the engine and the other equipment being separated by the firing aisle. By this arrangement the new batteries of boilers were set exactly opposite the old ones and the coal feed to them was taken from the same outlets in the coal bunkers above the aisle. The steam hoist draws its steam from one corner of the loop header and the turbines from separate outlets on the other side of the piping system, thus giving an excellent distribution of steam demand.

Return-tubular boilers were adopted in the first installation, because with them a large volume of water could be obtained to meet the sudden demands for steam imposed by the hoisting engine. The results obtained from the first two batteries of boilers were highly satisfactory, fluctuations in steam pressure within them being much less than could be anticipated with the same horsepower of water-tube boilers. This type of steam generator is eminently adapted to use in hoisting plants, and by utilizing battery settings, as in this instance, it is possible to obtain reasonably large units with fair economy of floor space.

The original power plant was equipped with two pairs of 78-in. x 20-ft. boilers having a total rated capacity of 800 hp. Each pair of boilers was set over a single stoker of the Harrington type.

#### UNITS WERE CHOSEN TO MEET PLANT NEEDS

The generating equipment originally installed consisted of one unit having a rated capacity of 450 kw. of 2,300-volt, 3-phase, 60-cycle alternating current. This unit was direct-connected to a Chuse 28x32-in. uniflow engine, which was operated non-condensing during the development period. A small 50-kw. engine-generator was also installed for lighting and miscellaneous service. A pair of 18x36-in. hoisting engines serving the auxiliary shaft and a steam-driven fan completed the major equipment of the first installation.

The boiler house is of steel-frame construction with walls of hollow tile. These are gunited on the outside and in the part used as an engine room are plastered on the inside. The boiler room is 92x100 ft. in plan and in the original construction was built so as to accommodate future units.

The size of the turbine room was increased somewhat from the original plans in order to provide for the new power units and for future units as will be described later. The completed building is 45x116 ft. and has a basement 13 ft. 6 in. high.

The completion of this plant involved a large increase in power capacity. The selection of units was made on the basis of a 6,000-ton output per day for No. 4 mine and a load varying from 900 kw. to 1,200 kw. as determined by a power survey of the No. 2 operation. In view of the large initial cost of an electric hoist for the No. 2 works, it was decided to leave the No. 2 steam hoist in place.

In planning this power house, the engineers had the unusual advantage of nearly four years of experience gained with the equipment originally installed. But, so satisfactory had been the operation that the original designs for and the arrangement of power units were followed without material change. It was decided, however, to add certain power-saving details to the original units, such as a condenser for the uniflow engine, superheaters for the original boilers and a clarifying sys-

tem for the water supply. These were omitted from the first installation, largely because their cost would not be warranted in view of the low tonnage obtained during development work.

The capacity of the original boiler equipment was increased by the addition of two batteries, which are duplicates of the original; each consists, as before, of two 78-in. x 20-ft. return-tubular boilers set over a single Harrington stoker. The plant now has a rated capacity of 1,600 boiler horsepower and when operated at 150 per cent of rating is capable of delivering regularly 2,400 boiler horsepower. This is sufficient for the operation of the No. 4 mine at rated capacity, together with the electrically-driven units installed at the No. 2 plant.

The grate area under each battery of boilers is 90 sq. ft., which is the same as that installed in the original plant. This gives a ratio of heating surface to grate area of  $33\frac{1}{2}$  to 1. The new settings are similar to the old, but the distance from the grate surface to the underside of the boiler shells in the new settings was made 7 ft. 3 in., which is slightly higher than in the old installation.

A concrete stack, 9 ft. in diameter and 136 ft. high, and a forced draft fan of 48,000 cu.ft. capacity when operating against a  $1\frac{1}{2}$  in. water gage, were both included in the original installation. They were regarded as ample to meet present requirements, although the general design of the plant provides for another stack and a duplicate fan should the load be increased by the addition of other mines.

This plant was designed to burn low-grade fuel, or that possessing little or no market value. The coal supply at the present time consists of crushed gob or pickings from the picking tables, together with the quantity of  $1\frac{1}{4}$ -in. screenings needed when enough pickings cannot be obtained. The provision for utilizing low-grade fuel is regarded as being of the utmost importance. First, it reduces fuel bills and, second, it tends to improve the quality of the coal produced at this mine.

The tendency at this operation will always be to pick thoroughly and to clean the coal well. Combustible pickings are not wasted, as at mines operated on purchased power, and the pickers consequently need not spend undue time in breaking up lumps in an attempt to separate rock from coal.

Fuel for the boiler plant is drawn from a small track hopper. This hopper can be utilized also for "foreign" coal or coal from the auxiliary tippie. It is fed by a conveyor from the main tippie where the gob and bone from the picking tables is crushed to  $1\frac{1}{4}$ -in. size and any deficiency in supply made up by the addition of  $1\frac{1}{4}$ -in. slack.

#### AUTOMATIC DRAFT AND STOKER CONTROL PROVIDED

The original forced-draft installation with its control mechanism was extended by means of ducts provided with proper dampers from the forced-draft fan. A curved breeching from the new boilers was connected with the stack. Both of these installations are adapted to connect also to a duplicate fan and another stack which may be required at some future time. The dampers, fans and stokers are all controlled by a balanced-draft system.

This equipment automatically maintains a draft of approximately 0.08 in. over the fire through proper regulation of the fan speed and the position of the



uptake dampers. Means for controlling the draft of the individual boilers is also provided through installation of stoker gates which insure the proper air pressures and volumes for the various compartments of the grate.

Approximately 150-lb. gage pressure is the maximum that can be safely carried with boilers of this type. This pressure is accordingly carried on these units and approximately 100 deg. F. of superheat is added. The superheaters are located in the rear combustion chamber. The new settings were fitted with superheaters when built, and superheaters were then added to the original settings. Ashes are removed by a steam-jet ash conveyor, which lifts them into a reinforced-concrete storage bin, from which they are loaded for disposal into cars running on a standard-gage track.

For the removal of soot from the flues, Vulcan blowers have been placed at the rear of the settings. These are fitted with elements that will operate on both the boiler and superheater tubes. The main steam header is a loop system of piping fitted together with

high has been provided. This is equipped with an automatic chemical-measuring device for introducing alum and caustic soda. The normal capacity of the settling system is 6,000 gal. per hour, allowing approximately four hours for flocculation and settlement of sludge.

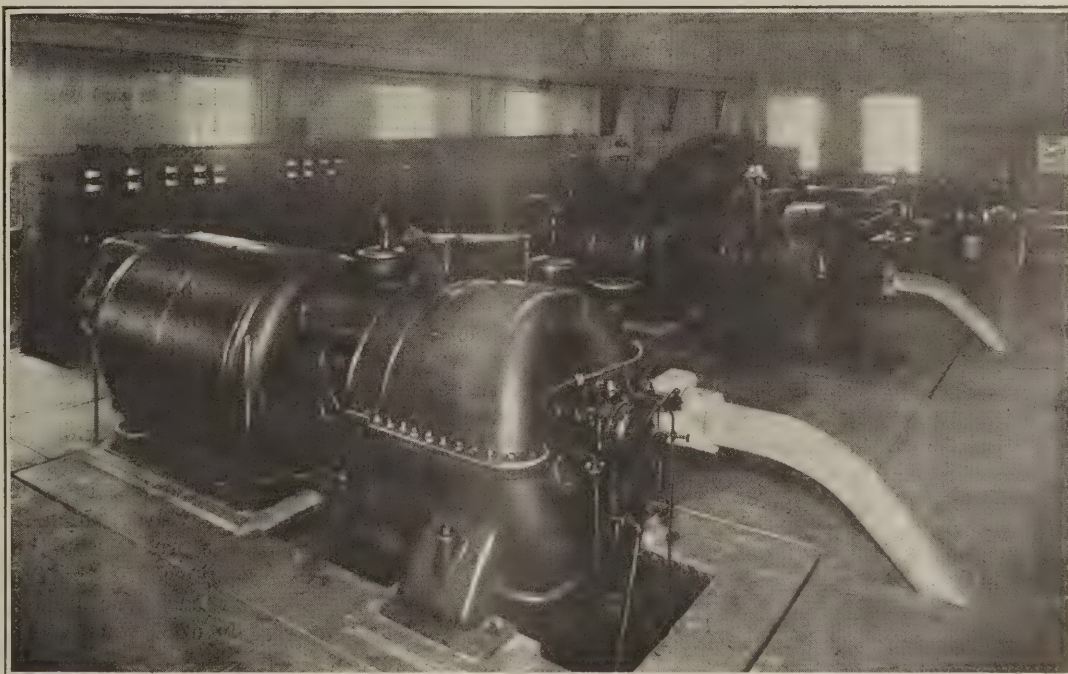
#### ONLY FILTERED WATER REACHES THE PLANT

Under average conditions, approximately  $\frac{1}{2}$  lb. of alum and  $\frac{1}{2}$  lb. of sodium hydroxide per thousand gallons of water treated is required. It is necessary to clean out the sludge about every ten to fourteen days. Water leaving the settling tank is pumped through two pressure filters, each of 6 ft. 6 in. diameter and 6 ft. 10 in. high, to an elevated storage tank having a capacity of 40,000 gal. and affording a minimum head of 40 ft. From this tank, water is drawn for all plant purposes. The arrangement of the settling system is such that the flow of water is automatically controlled and regulated by the water level in the main storage tank. The make-up water for the power plant is further treated

FIG. 1

#### Power Plant

This plant now contains a high-pressure turbo-generator, a mixed-pressure turbo-unit, utilizing the exhaust from the hoist and various auxiliaries, and an engine-driven unit. All these machines are operated condensing. Provision has also been made for the possible future installation of another turbo-generator when the load on the plant becomes heavy enough to warrant it.



Vanstone flanges and large-radius expansion bends. Angle stop valves are installed on all outlets both to and from this header. These eliminate many fittings and obviate water pockets in the line. High-pressure traps handling the condensate from the steam lines return all drips to the feed-water heater. An auxiliary header supplies steam to the boiler-feed pumps and auxiliary units.

In order to enable the firemen to operate the plant to best advantage, meters have been installed upon each boiler. These indicate the flue-gas temperature, the percentage of excess air and the steam flow. A water-supply system was constructed several years ago, fed from surface drainage to a pond approximately  $1\frac{1}{2}$  miles from the plant. A portion of the watershed or drainage area consists of cultivated fields, and as a result the water usually carries much mineral matter in suspension. This water is objectionable, not only as boiler feed, but also for use in showers, wash basins and other plant facilities.

To eliminate the matter held in suspension, a 30,000-gal. settling tank 18 ft. in diameter and 18 ft. 4 in.

by a zeolite system, thus insuring clear water of practically zero hardness.

Treated water is sent to the boilers through a feed-water heater by means of a 12x8x12-in. steam-driven direct-acting duplex pump. This is controlled by boiler feed-water regulators with pressure governors on the pump.

The normal full-load generating capacity of this plant is 2,700 kw., made up of the following units:—One 1,500-kw., 0.8-power factor, high-pressure, turbo-generator, with direct-connected exciter; one 750-kw., 0.8-power factor, mixed-pressure steam turbo-generator, also with direct-connected exciter, and the original uniflow 28x32-in. engine unit, direct-connected, to a 450-kw. generator with a belted exciter. Although the original unit was run non-condensing during the development period, all machines are now operated condensing. Provision has also been made for the possible future installation of a third turbine, which will probably be of 2,000-kw. capacity.

Direct current is used underground. This is supplied from motor-generator sets installed within the



mine and fed by 2,200-volt alternating current through armored transmission cables. Storage-battery locomotives are used for gathering. They are charged on the second, or night, shift.

The established power requirements of this plant, including both electrical and steam loads, the latter including the requirements for heating the tipple and wash house, are shown in Table I.

Table I—Power Requirements at Donk No. 4 Plant

	Average Load, kw.	Sustained Peaks, kw.
Mine No. 2 only, already fully developed...	900	1,200
Mine No. 4 only.....	1,500	2,000
Mines Nos 2 and 4 combined.....	2,050	2,600
Mine No. 4, charging shift.....	650	.....
Mine No. 4 idle shifts.....	330	.....

At the present time, the load from No. 2 mine, when No. 4 is idle, is carried by the 1,500-kw. unit, or by the 750-kw. unit when running on high pressure. When only the No. 4 operation is running, the load is carried by the 750-kw. mixed-pressure unit supplemented by the 450-kw. machine operating condensing. When both mines are in operation, the 1,500-kw. unit is put into service in place of the 450-kw. machine. For the ultimate load, when both mines are in operation, the 1,500-kw. unit and the 750-kw. mixed-pressure unit, can carry the load supplemented, if necessary, by the 450-kw. machine, and for No. 4 mine alone the two turbines will easily carry the load.

#### SPACE PROVIDED FOR ADDITIONAL POWER UNIT

It will be noted, however, that an accident to any unit will seriously cripple the operation when the full load is on, and space accordingly has been provided for a 2,000-kw. turbine to be installed in future when the load begins to approximate the anticipated ultimate amount. This future machine supplemented by either of the other units easily will carry the entire load. When the ultimate load on the plant is attained, however, it also may be desirable to add a spare battery of boilers, although the four units now provided will carry the load at approximately 150 per cent of normal rating.

The water rates of the various power units are as shown in Tables II, III and IV.

All units are fitted with surface condensers. The uniflow engine is provided with a condenser of 1,220 sq.ft. of tube surface, a 1,250-gal. per minute circulating pump, and duplicate Radojets. The 1,500-kw.

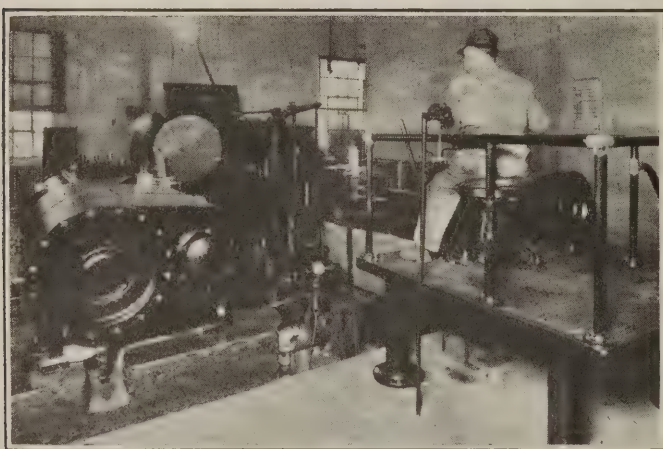


Fig. 2—Steam-Driven Hoist

Investigation showed that an electric hoist would be slightly more economical than one operated directly by steam but would entail a much higher initial investment. A steam hoist accordingly was chosen. The exhaust from this unit is passed through a regenerator and thence through a mixed-pressure turbine.

Table II—Water Rate, 450-kw. Uniflow Engine

	Non-condensing, Lb. of Steam per Kw.-Hr.	Condensing, Lb. of Steam per Kw.-Hr.
$\frac{1}{2}$ load.....	29	19.4
$\frac{3}{4}$ load.....	27.9	18.5
Full load.....	27.9	18.5
Full load.....	29	19.1

Table III—Water Rate, 750-kw. Mixed-Pressure Turbine

	Low pressure, Lb. of Steam per Kw.-Hr.	High pressure, Lb. of Steam per Kw.-Hr.
$\frac{1}{2}$ load.....	47.9	26.2
$\frac{3}{4}$ load.....	42.0	22.3
Full load.....	41.0	20.5

Table IV—Water Rate, 1,500-kw. High-Pressure Turbine

	Lb. of Steam per Kw.-Hr.
$\frac{1}{2}$ load.....	19.4
$\frac{3}{4}$ load.....	18.5
Full load.....	18.6

unit and the 750-kw. unit are provided with condensers of 4,000 sq.ft. tube surface and 3,500 gal. per minute circulating pumps with Radojets and after-condensers.

Air for circulation through the turbo-generators is purified by an air washer located in the basement of the power house. All turbines are set on steel supports composed of box sections filled with concrete. These provide a setting for the various machines and their condensers that is independent of the floor.

Low-pressure steam for operation of the 750-kw. mixed-pressure unit is drawn from the exhaust of the main hoisting engine, the auxiliary hoisting engine and other plant auxiliaries with a view to utilizing all the steam not required for feed-water heating. The operation of the hoisting engines is necessarily intermittent, and in order to furnish a continuous flow of steam to the mixed-pressure turbine, a pair of regenerators, each 9 ft. in diameter and 25 ft. long operating in parallel and set one above the other, have been interposed between the exhaust-steam header and the turbine.

The flow of the exhaust to the regenerators is controlled by a flow valve, which is adjusted to maintain automatically the pressure in the exhaust-steam system between the engines and the flow valve at a minimum of 1 lb. This has been done in order to assure a sufficient supply of exhaust steam for feed-water heating. It provides a uniform temperature within the feed-water heater of approximately 205 deg. F.

Each regenerator stores 600 lb. of steam when the pressure falls from 18 lb. per square inch absolute to 14.7 lb. When the pressure is 19 lb. per square inch absolute and drops to 14.7 lb. per square inch, 700 lb. of steam is available. Any excess of steam after the regenerator and feed-water heater requirements have been filled, is vented to the atmosphere through a specially designed back-pressure valve.

#### CIRCULATING WATER COOLED IN A SPRAY POND

Should the supply of exhaust steam fail, because of the hoisting engines not being in service, high-pressure steam is automatically cut in and supplied to the mixed-pressure unit when low-pressure steam drops to a predetermined point, or, in other words, whenever high-pressure steam may be required for carrying the load.

The available supply of water for condensing purposes, as is frequently the case at plants located in this region, was limited, and it was accordingly necessary to provide a spray pond for cooling the condenser water.



FIG. 3

**Spray Pond**

Water for condensing purposes is obtained only with difficulty at many mines. By using a spray pond the circulating water of the condenser may be used over and over again sustaining losses only from evaporation, from leakage and from the blowing away of spray by the wind. These losses readily are replaced. Such a pond gives best results when the atmosphere is dry and its poorest results when it is humid. Under ordinary circumstances, however, it affords fairly satisfactory service regardless of weather conditions.



As this pond is located opposite the power house and just across the mine tracks from it, the pipes to and from the pond are carried under the railroad fill. The condenser water is circulated by motor-driven centrifugal pumps. The spray pond is 100x271 ft. in plan and 264 spray nozzles are installed over it.

Sufficient spray-pond capacity is provided for handling 10,500 gal. of water per minute when a pressure of 7 lb. per sq.in. is available at the nozzles. This gives a capacity of 40 gal. per minute per nozzle at the pressure named.

The switchboard installed in the power plant is of the remote manually-operated type, with all switches mounted on separate pipe framework in the rear of the panels. This switchboard is located in a lean-to so that the board is flush with the south wall of the power house. Three-phase, 60-cycle alternating current is generated at 2,300 volts and fed to the various loads as required.

Banks of step-down transformers reduce the voltage from 2,300 to 220 for all motors installed on the surface as well as for lighting in both auxiliary and main tipples. An outdoor step-up substation composed of three 333-kw. single-phase transformers raises the voltage to 33,000 for transmission to the No. 2 mine at Maryville.

At mine No. 2 a step-down station of the same capacity, as that above described, reduces the voltage to 2,300 at which potential current is supplied by way of a borehole to 2,300-volt alternating-current, 265-volt direct-current synchronous motor-generator sets installed within the mine. These machines supply direct current to the mining machines and haulage locomotives.

The underground load at mine No. 4 is served by a 2,300-volt line extending down the auxiliary shaft to synchronous motor-generator sets installed at strategic points underground in a manner similar to that followed at mine No. 2. By using these synchronous motor-generators and giving them a leading power factor, the power factor of the whole plant is held

approximately at unity, notwithstanding the fluctuating loads that are encountered.

The operating results obtained at this plant have thus far proved highly satisfactory. Power costs have been reduced month by month until, with a tonnage at No. 4 mine scarcely more than half its rated capacity, the cost per kilowatt-hour for power used at both operations has been reduced to 1.6c. This includes all plant labor and maintenance with a suitable proportion of the total executive and clerical expense. It includes also interest and amortization of the power plant and its equipment, as well as coal charged to the plant at the regular market price, although at least one-third of the fuel now burned consists of pickings which not only have no commercial value, but which otherwise would have to be disposed of at an additional expense.

The operating executives of the Donk Bros. Coal & Coke Co., under whose direction the construction and development of this mine and plant was performed, are: Edwin H. Conrades, president; Edmund C. Donk, vice-president; and Walter J. Clark, general superintendent. The plant was designed and constructed by the Allen & Garcia Co., of Chicago, under the immediate supervision of Wayne O. Axtell, resident engineer. From the results already secured, it is fair to predict that power and mining costs will be materially reduced from their present levels when the tonnage of the mine approaches its normal rating.

THE UNION PACIFIC COAL CO. has eliminated black powder from its mines. It is extending its water lines to the face of the workings so that all loaded cars may be drenched before they are started out of the mine. As has been announced adobe or rock dust has been spread in the mines, the work having been under way for six months. This will be completed by the fall when the low humidity season sets in. All mines known to be gaseous are being run on 100-per-cent closed lights and an order for 2,100 additional electric lamps has been placed to make the installation complete in both the gaseous and non-gaseous mines of the company.





*Tipple at Gebo, Land Leased from U. S. Government*

## U. S. Rules Make Mines in Public Lands Safer

Regulations Could Not Go Into Detail to Meet All Conditions in Forty Million Acres of Coal but Sound General Principles Are Covered Benefiting Miner, Operator and Public

BY H. I. SMITH

Mining Supervisor, U. S. Bureau of Mines  
Denver, Colo

**P**REPARING regulations for coal mining on leased public lands in the United States was no simple matter. It was difficult indeed to frame rules applicable to mining in all the coal deposits in the 40,000,000 acres under government control but the general principles of good mine operation were covered with safety especially in mind. The regulations, as they now apply in the 670 leases on more than half a million acres in fifteen states are believed to be absolutely sound and fair, beneficial alike to miner, operator and the public. I cannot go into all the details of the regulations but after tracing their history, I want to touch upon some of their features which have to do with safety.

In 1913, the Secretary of the Interior charged the Director of the Bureau of Mines with the duty of inspecting the physical operation of coal, asphalt and such other mines as belong to the Indians and Indian tribes wherever located and to draft necessary rules and regulations from time to time regarding the operation of leases over such Indian lands and all other lands leased by the Department of the Interior for mining purposes or operated subject to its approval. These regulations must be submitted to the Department for its approbation.

The first regulations, prepared by the Bureau of Mines, and applicable to coal mines on public lands, were approved May 10, 1913. They applied to the lease

of the Owl Creek Coal Co. in Wyoming, which lease was granted by special act of Congress. The only other lease operating on public lands, other than in Alaska, prior to 1920, was that of the Victor American Fuel Co., to which a lease was granted by a court decision. This lease was supervised by the General Land Office. The operating regulations applicable to leased coal lands in Alaska were the second set of rules which the Bureau assisted in preparing. They were approved May 18, 1916.

### BUREAU MAKES REGULATIONS FOR LESSEES

When the act of Feb. 25, 1920, was passed permitting the leasing of coal, oil shale, phosphate, soda, oil, and gas on public lands, the Bureau was delegated to prepare the operating regulations necessary, in accordance with Sections 30 of the Act, which reads in part as follows:

Each lease shall contain provisions for the purpose of insuring the exercise of reasonable diligence, skill, and care in the operation of said property; a provision that such rules for the safety and welfare of the miner and for the prevention of undue waste as may be prescribed by said Secretary shall be observed.

In the preparation of these regulations invitations were sent to the American Institute of Mining and Metallurgical Engineers, the American Mining Congress, the National Coal Association, and to the governors of eleven public-land states, to appoint representatives to attend a hearing at Washington. Prior to the date set for this meeting, regulations were prepared as a basis. These were considered one at a time at the session and were discussed at length.

From the minutes of the several sessions a second

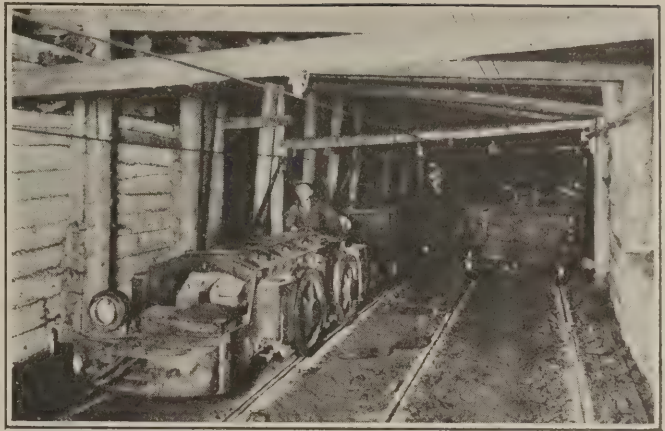
NOTE—This article is constructed from a paper read by Mr. Smith at the February meeting of the Rocky Mountain Coal Mining Institute at Denver. The headpiece shows the oldest lease on Government lands, granted by a special act of Congress, Aug. 1, 1912. This mine, which is owned by the Owl Creek Coal Co., has the biggest production of any mine operated on lease from the United States. In 1923 this plant produced 293,424 tons. Illustrations furnished by courtesy of Goodman Manufacturing Co.



set of regulations was prepared and re-submitted by mail to the delegates and other prominent mining men for their further comment. These comments were carefully tabulated and in general the prevailing opinions were adopted. Whenever possible, the exact wording of some one of the delegates was used. The regulations now in effect were approved by the Secretary of the Interior, April 30, 1921, and are now just as much a part of the contract as any other paragraph in the lease.

I will not refer to the policy of Congress or to the history of how the United States retained control of 40,000,000 acres of coal land. I use the term "control" qualifiedly, as 37½ per cent of all the income goes direct to the state in which the land is located; 52½ per cent is appropriated to the Reclamation Fund; and only 10 per cent for supervision is retained by the Government.

There are on this area at the present time under lease or applications for lease, coal beds as thin as one foot in thickness to beds 100 ft. thick; some beds lie horizontal, others are practically perpendicular. Almost any dip between these extremes can be found. The cover varies from stripping operations where the dirt



**Locomotive Pulling Trip of Empty Cars at Gebo**

Four 6-ton, two-motor locomotives operate on the comparatively level cross headings and haul trips of from 45 to 50 cars to the main slope taking them from the various partings on the cross entries. Only alternate sets of levels become electric haulage roads.

favorable to making changes in mining methods. Again, it was impossible to change a mine which had been in operation for many years, except to modify the projected plans and working conditions and provide for the required safety features.

I do not wish to enter into too much detail in discussing the application of the rules to the leased public coal lands and to mining operations on public lands covered by prospecting permits, but I do wish to discuss briefly a few of the things which, from our inspection of mines on leased lands or adjacent to leased lands, should be stressed even though some of them may be considered as old subjects.

Those topics which I have chosen relate to fireproof buildings, electric installations, explosives, explosions, rescue apparatus, and mine maps.

#### MINE MAPS SHOULD SHOW MINE PROGRESS

I have placed mine maps on the list as matters of leading importance because I wish to emphasize the fact that maps only rarely show such data as will enable the owners of the mine mapped, when they are called on by tax authorities, to show the depletion for the several tax periods. The maps usually made will not inform the owners what percentage of coal per acre has been mined, the condition of the abandoned



**Shortwall Machine Cutting up Pitch in Gebo Mine**

The seam at Gebo is inclined at an angle of 22 deg. to the horizontal. The rooms are arranged so that the coal is cut up the full pitch of the seam, the roads being laid on the strike of the measure and the main haulage road, which is laid with 60-lb. steel, going down the pitch of the seam.

is shoveled off the coal by hand to coal under an overburden of more than 2,000 ft. The grade of the coal ranges from lignite with 40 per cent of moisture, to anthracite. The size of operations range from a required production of 275 tons to 200,000 tons per year. This article will not deal, however, with many of the difficulties thus arising.

Since Feb. 25, 1920, under the provisions of issuing leases, licenses, and prospecting permits, 670 grants have been made, comprising more than one-half million acres of coal lands in fifteen different states. All of these grants are west of the Mississippi, with the exception of one lease in Alabama. Of this number there are 116 coal leases in eight different states, covering 60,000 acres.

The regulations necessarily had to be rather flexible for the natural conditions on the public coal lands vary as widely as coal-mining conditions could vary. The mining laws and mining practices in the several states varied widely. The attitude of labor was not always



**Gathering Hoist Pulls Car from Room, Gebo Mine**

Car is pulled by a hoist, located beneath the light in the end of the heading, uphill from the room neck and then is lowered down the stub slope to the parting on the level side entry. The steeply pitching mines of the Rocky Mountain region still use rope haulage extensively on the pitches but all the level haulages are by electric locomotive.



workings or what progress was made in the operation of the mine from year to year.

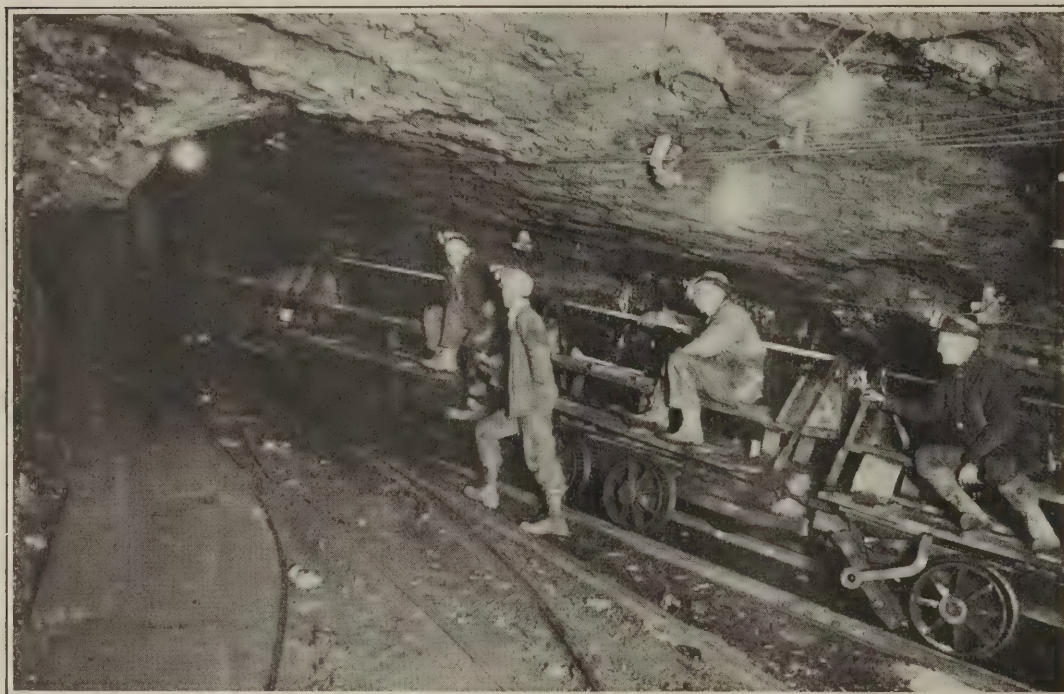
The production requirements of the leases granted have been, with few exceptions, based on a life of 50 years, so that, as a matter of good business, it is essential that the construction of temporary buildings of the firetrap nature be discouraged and that buildings be more of the fireproof type. The regulations provide that flammable buildings shall not be placed within 75 ft. of any mine opening. However, some consideration must be given to cases where the nature of the mine is such that the operation of the property will be only temporary.

With reference to wash-houses, one cannot imagine how quickly after a wash-house fire, a pair of burned overalls and a dirty shirt jump to the value of a dinner-suit and a silk shirt. The claims for lost watches and rolls of money are astonishing. After such an experience in a mining community, when many thousand dollars are claimed and lawsuits threatened, the local

Electric power is of such importance in American mines that the mining men of the present day are not attempting to increase safety by eliminating electricity, but by making conditions such as will be safe with the present electrical equipment, but if this cannot be done, the endeavor is to get electrical equipment which will pass tests entitling it to be termed "permissible" under the conditions to be imposed.

At the hearing in Washington, I can recall but one person who advocated higher than 300-volt current for portable machinery, and so 300 volts was set as the maximum voltage to be used on portable electrical machinery in the mines on public lands. However, mines equipped with higher voltage at the time of obtaining a lease may be permitted to continue its use upon petition to the Secretary through the mining supervisor.

Some thought that lead-covered cables in a conduit might be satisfactory for conducting high voltages underground, but analyzing the cost and the added



#### Gebo Man Trip

Men are lowered down the main slope in a train specially constructed for that purpose. They sit in such a location on the car that they are not likely to be struck by overhanging rocks at the side. With good seats men are not likely to burn one another with their carbide lights or be injured as they are when entering the mine on the regular trip.

management takes stock of all the buildings and starts a fireproofing campaign.

Fires start in wash-houses, as well as in other buildings, from spontaneous combustion and so every endeavor should be made to keep wash-houses clean, and no old clothing or towels should be permitted to be discarded and left where they may come in contact with steam pipes, or be deposited in any place where they will not be sufficiently well ventilated to prevent spontaneous combustion. One of the greatest fire hazards in a wash-house is present where the mine management permits those using the wash-house to put their towels or other fabrics on the steam pipes to dry. This is especially true should the clothing be oily.

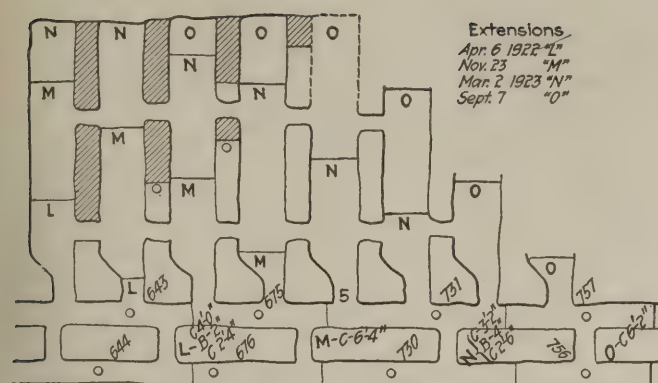
The steam pipes should be sufficiently far from any contact with wood as to eliminate the chance that accumulations of lint will become ignited and set fire to the wood. Though the pipes should be protected to keep those using the wash-house from getting burned, the guards should be open to permit of radiation and to lessen the danger of fires.

safety, both to the employees and to the property, it was considered advisable to require an armored cable for all 2,300-volt circuits.

In regard to electrical installations, I wish to make two recommendations: First that a special color of insulation tape be used on high-voltage wire connections in power stations both on the surface and underground. As yellow has been adopted by a number of coal companies for this purpose, it is recommended that this practice be continued so that any newly employed electrician in a mine can tell at a glance which are the high-voltage connections. Black tape then should be used only for low or medium voltages.

Secondly, as alternating current rapidly has been replacing direct current for operating mining machines, I would advocate the use of a three-strand cable in place of three single wires. The more closely together these wires can be placed the less loss of power, and if all three wires are in a single cable, the accident hazard is reduced. The cost of stringing the single cable will almost balance the difference in cost.





### How to Plat a Mining Working Historically

Some map makers use dates showing progress of development and coal extraction but a date, like a large number on an automobile is not desirable. A letter takes the eye more easily and conveys the message more rapidly. It also takes less room and when the map is photostated to a small size the letters are still legible. Maps today should be drawn with lettering that will make necessary information decipherable on a photostat of any dimension likely to be made.

There are many instances where electricity has been instrumental in igniting black powder, both in transit and at the working face. As a result, many employees have been suffocated and a number of dust explosions initiated. Consequently too much precaution cannot be taken to protect powder at the face adequately and to insulate all cars used for its transportation. Though the operating regulations permit the use of black powder under certain restrictions, the sooner it is entirely eliminated the safer it will be for mine employees and the less the loss to the operators in fires and explosions.

During the Pittsburgh meeting of the Coal Mining Institute of America in December, 1923, a demonstration was made to show how quickly a keg of powder would explode when brought in contact with electric current. Two empty powder kegs were laid on a block of wood with a wire connected to each keg. A full powder keg was laid across the two empty kegs, and the current turned on. The top keg was pulled by a rope so that a movement was imparted similar to that which it would get in a car. The keg exploded almost immediately after the first movement.

Mines are being rock-dusted as a means of preventing explosions in Pennsylvania, Illinois, Oklahoma, Wyoming, New Mexico, Colorado, Alabama and probably in other states. The English law, as is well known, requires that there shall be in all road and rib dust at all times not less than 50 per cent incombustible material. As a result of this law, all of the several explosions in Great Britain occurring during the past year were blanketed within a short distance from the point where they originated.

### EVERY UTAH MINE MUST HAVE RESCUE APPARATUS

The state mining law of Utah requires rescue apparatus to be available for each coal-mining operation where fifty or more men are employed. The value of such apparatus can be appreciated only by operators who have had real emergencies of this character and who had previously provided such apparatus for their mines. The regulations require that at every mine in which more than one hundred persons are employed underground on any shift, the lessee shall have kept and maintained at the mine in order, ready for use, not less than five sets of oxygen or self-contained breathing apparatus. Many of the present lessees had equipped

themselves with mine-rescue apparatus prior to obtaining a federal lease and only a few have hesitated to comply with these provisions of their lease.

The regulations require that the mine maps be posted periodically. Some engineers keep maps showing the area mined over each extension period. This method requires a large number of maps. Other engineers use various methods to show where the room and entry faces were at the time of each extension. Some maps we get do not indicate in any way where the faces are at any time, except at the time of the last survey.

The method which appears to me to give the clearest picture of the mine and its history and to show those things which the Government requires shall be on the map of every lessee, is that worked out and used by H. P. Dyer, general manager and chief engineer of the Vandalia Coal Co., at Terre Haute, Ind.

The sketch which accompanies this article shows that in place of putting the dates at the face of the entry and rooms at the time of each extension, letters are used consecutively for each survey with the reference date on the margin of the map. A light line is drawn across the face of each room and entry, and the letter is put on the outby side. If the place is being worked at the time of survey, the ribs are extended beyond the face. If the place has been stopped there are no projections. Should the room or entry be caved or be inaccessible to the surveyor, the distance to the face is obtained as closely as possible from the mine boss or other reliable source, and the projection is shown in dotted lines.

Following the letter showing the projection on the entries, the section of the coal bed is given. Only the number of each fifth room is shown. Hatching is used only to show pillars actually extracted. The hatching does not extend over the room, nor does it cover stumps that the mine boss did not recover. This latter provision is important should any squeeze develop.

The Act of Feb. 25, 1920, requires in addition to periodic maps, that the elevation based on sea-level data be shown at 500-ft. intervals. Elevations and contours normally should be shown on separate maps.

All of the requirements under the regulations are of as much value to the operator as to the Government, and it is hoped that lessors of these public coal lands will realize this and co-operate more fully with the Government, in carrying out the regulations to the full.



Plan of a Section of the Mine Workings at Gebo

This shows the method that has been found most satisfactory in Wyoming where the measures quite generally pitch heavily. It has been found more economical and much safer to lay out the rooms on the strike of the bed. The main slope is equipped with a 2,000-hp. cylindrical-drum steam hoist located practically on the plane of the coal floor and equipped with a 1½-in. steel rope. It pulls out a trip of ten loaded cars, weighing 7,500 lb. each, 80 to 90 trips being made each eight-hour day. The hoist is probably the most powerful in Wyoming. Small electric drum hoists are placed at the head of the butt slopes.



## Fatality Rate Per Man and Per Ton Sure to Decrease

Industrial Accidents as a Whole Have Increased—  
Rapid Extraction Reduces Loss of  
Life in Pillar Work

BY NEWELL G. ALFORD  
Consulting Engineer, Pittsburgh, Pa.

IN THE last year industrial-accident rates generally have increased, but there has been no appreciable increase in our coal-mining fatalities over the past decade. A recent publication\* cites that more than half the compensation states, representing all sections of the country, show an increase in industrial accidents of from 6 to 53 per cent, with an average of 29 per cent for all those reporting.

About coal mining, it is stated that "we are killing miners in the United States three times as fast as they kill them in Great Britain."† It is not mentioned, however, that we are mining slightly more than twice as much coal as Great Britain with 60 per cent as many men exposed to the hazards of mining. While the quantity of coal produced per fatality is not a proper measure of relative safety, the coal production per fatal accident in the two countries compared for 1920 is—

Great Britain—206,553 net tons coal (all kinds).  
United States—244,828 net tons bituminous coal.

Table I gives the fatality rates per thousand of men employed in coal mining in Great Britain compared with bituminous mining in the United States from 1873 to 1921, inclusive. Of particular interest is the fatality rate for falls of roof and coal, also shown in Table I. More than half the fatalities are caused by roof falls, and though the annual number of fatal accidents from this cause has changed but little in the last fifteen years, as shown in Table I, there has been an enormous increase in mining without a correspondingly increased sacrifice of life.

### AFTER ALL ROOF FALLS LEAD FATALITY LIST

Fatalities from roof falls deserve greater attention because they comprise over half of all the underground fatal accidents from all causes and, in a large majority of the localities, over half of all accidents from all ordinary causes. Table II gives the division of roof-fall fatalities, distributed by classes of work, and Table III gives a distribution of all fatalities by location. Both of these tables represent about 60 per cent of the Pennsylvania bituminous production for the periods they respectively cover, with the addition, in Table III, of data from two large companies in other states.

Table II shows work of mining and loading of coal to be most hazardous and the information in the first five lines and lines 8, 9 and 10 of Table III shows the hazard on pillar extraction to be greater than that in advance work for the usual methods of pillar extraction.

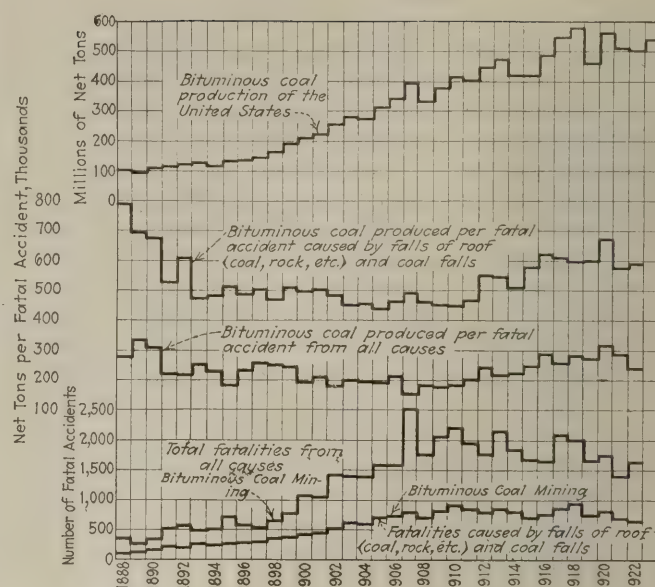
In Table III, the hazards from falls, in Pennsylvania mines, based on lines 1 and 2, is three times greater in pillar extraction than in advance work;  $(209 \div 15.6) \div (266 \div 59.7) = 3$ .

At Gary, W. Va., under Colonel O'Toole's manage-

NOTE—Article entitled "Engineering and Coal-Mine Accident Prevention," read before the West Virginia Coal Mining Institute, Elkins, W. Va., June 17-18.

\*American Labor Legislation Review, June, 1924, page 180.

†John B. Andrews, "The Annals of American Academy of Political & Social Science," January, 1924. Coal Production of Great Britain, 1920—254,060,302 net tons. Coal Production of United States, 1920—568,000,000 net tons.



Bituminous-Coal Output, Tonnage per Fatality from Falls and from All Causes, Total Fatalities

Though more tons of coal were mined per accident both from falls of roof and all causes in the late eighties and early nineties, we are doing better by far than in later nineties and in the first ten years of the present century. The safety campaign has done much. It is destined to do more. Not only is the downward swing in safety arrested but speaking broadly, overlooking the last two years an upward swing has taken its place.

ment, where slightly under 60 per cent of the men on coal are on pillars, the hazard from falls in pillar extraction, based on data in lines 6 and 7, is one-fourth of that on advance work;  $(28 \div 41.7) \div (9 \div 58.3) = 4$ .

In the third illustration, lines 8, 9 and 10, the hazard from falls is twice as great in pillar extraction as in advance workings.

The roof conditions at Gary are by no means better than the average, 11 per cent of the coal tonnage handled represents the actual quantity of slate that is hauled outside and dumped, in addition to fully as much more slate, rock and rash that is gobbled inside. The draw slate over the No. 3 Pocahontas Seam is particularly dangerous, holding "kettle bottoms," immediately over the coal, the shape of truncated cones ranging from 2 or 3 ft. to sometimes 10 or 12 ft. in diameter on the bottom.

When a place is first excavated, it is almost impossible to discover them, whereas in the second mining they have either partly settled in the pillar coal or dropped on the fallen coal before it is loaded out. These

Table No. I—Fatality Rates in Coal Mining Per 1,000 Employed

	Killed by Roof and Coal Falls		—Killed—All Causes—	
	Great Britain	United States	Great Britain	United States
1873-1882	1.12	1.44	2.24	3.18
1883-1892	1.00	1.25	1.81	2.68
1893-1902	0.76	1.48	1.39	2.98
1903-1912	0.74	1.73	1.33	3.72
1913	0.68	1.69	1.55	3.73
1914	0.70	1.48	1.15	3.22
1915	0.89	1.19	1.36	3.09
1916	0.89	1.33	1.32	3.09
1917	0.89	1.61	1.34	3.56
1918	0.86	1.70	1.39	3.38
1919	0.62	1.42	0.94	2.98
1920	0.55	1.43	0.88	2.89
1921	0.42	1.23	0.66	2.42
1922	....	1.06	....	2.32
Penna. Bit.				
1916-1922	....	1.23	....	2.18

Figures for Great Britain from *Colliery Guardian*, March 9, 1923. Figures for the United States represent bituminous coal mines, from Coal Mine Fatality publications U. S. Bureau of Mines by Albert H. Fay and William W. Adams. Fatalities from falls of coal off ribs in the U. S. are about 2 per cent of the total fatalities and are included in the fatality rates for falls.



**Table No. II—Fatalities From Falls of Roof and Roof Coal; Pennsylvania Bituminous Mines, 1916-1922, Inclusive**

Labor	Falls of Draw Slate (Pittsburgh Seam)	Falls of Roof Coal	Falls of Roof—All other Kinds	Total
Mining.....	113	17	176	306
Cutting with machine.....	19	4	22	45
Drilling or loading shot.....	16	1	22	39
Going back to shot.....	11	2	23	36
Pushing car or machine.....	10	1	16	27
Loading coal or rock.....	180	21	208	409
Taking down roof.....	67	2	74	143
Setting props.....	53	3	65	121
Drawing props.....	55	10	47	112
Traveling roadway.....	32	5	50	87
Working on track.....	9	4	30	43
All other falls of roof.....	3	..	..	3
Total.....	568	70	733	1,371

Does not include 181 fatalities from sliding coal, falling objects, etc. Arranged from Table XVI, "Statistical Analysis of Coal Mine Accidents in Pennsylvania 1916-1922, incl.," by Rush N. Hosler, Harrisburg, Pa.

conditions are met with careful and systematic timbering, based, on Colonel O'Toole's precept that all roof is dangerous. Close supervision of the men on coal and adequate lighting of the working places have also largely shared in greater safety from falls in pillar extraction.

Though the standing age of roof is universally recognized as a most important factor in roof-fall accidents, there are at present no actual figures to measure the direct relation to either accidents or fatalities in terms of lapse of time following excavation. It is a fact, however, that the more rapidly an area is worked the less is the danger from roof falls, and that the greater degrees of concentrated mining carry closer supervision and decreased exposure to the men.

The data in Table III, about Colonel O'Toole's mines, probably represents a far greater degree of concentration than any similar aggregate tonnage mined elsewhere, and it is known that the roof-fall accidents in pillars have been very largely reduced by those particular methods of working.

Properly used, mechanical loading will increase the possibilities of concentrated work. Over 2,000,000 tons

of coal were mined with the "Coloder" by the Pocahontas Fuel Co. with only one accident of any kind, and this case was a broken ankle. With the "Coloder" it is found that the timbering is less because the machine will load as much coal in an hour as two men will load in two or three days, and the machine will get out the coal before the roof has had time to settle. With the same roof conditions, in hand loading, the roof probably would fall at least once and would have to be cleaned up and retimbered before the coal could be loaded out.

Anything that will reduce the number of men employed and increase the output per man will reduce accidents, and as greater degrees of concentration in mining prevail with efficient application of machinery, accidents in coal mining are certain to decrease.

## Washing Ribs Before Rock Dusting

T. G. Fear, general superintendent, Inland Collieries Co., Harmarville, Ind., in a recent letter says that it is not necessary to wash ribs before rock dust is deposited. If the rock dust is applied before the ribs and roof are entirely dry the dust will cake and the benefit of the rock dust will be entirely lost as far as the extinguishing of flame is concerned. The only benefit to be derived from the dust thus deposited on the rib is that by reason of the washing there will be no coal dust to propagate a flame.

The main shaft bottom at the Indianola mine was recently rock dusted. The double-track loaded side is timbered with steel I-beams, placed 5 ft. apart, and coal dust has been accumulating on these beams. When this place was rockdusted most of the coal dust was blown off the timbers and on the floor farther along. An examination of the ribs and roof along the main north entry does not show any deposition of coal dust, "this," says Mr. Fear, "proving my theory that the very fine coal dust when placed in suspension with fine rock dust makes a mixture that is precipitated to the floor."

**Table No. III—Hazard in Pillar Extraction**

Location	Fatalities from Falls					Fall Fatalities per Cent	In-side Men per Cent
	Draw Slate	Roof Coal	All Other Roof Falls	Coal From Face or Sides	All		
(1) In advance working places.....	104	7	132	23	266	48.9	59.7
(2) In pillar places.....	66	10	98	35	209	38.4	15.6
(3) All other places.....	24	.....	44	1	69	12.7	24.7
(4) Total (1), (2) and (3).....	194	17	274	59	544	100.0	100.0
(5) Percentages in (4).....	35.7	3.1	50.4	10.8	100.0	.....	.....
United States Coal & Coke Co., Gary, W. Va., 1916-1920, inclusive, Production—21,869,964 net tons.							
(6) In advance workings.....	9	3	13	3	28	75.7	41.7
(7) In pillar places.....	4	1	4	0	9	24.3	58.3
Total (6) and (7).....	13	4	17	3	37	100.0	100.0
Company operating in four states, 1916-1920, inclusive, Production—43,995,007 net tons:							
(8) In advance workings.....	.....	.....	.....	.....	17	29.3	42.0
(9) In pillar places.....	.....	.....	.....	.....	34	58.6	34.0
(10) All other places.....	.....	.....	.....	.....	7	12.1	24.0
Total.....	.....	.....	.....	.....	58	100.0	100.0

Data in lines 1, 2, 3, 4 and 5 from Table XIX, "Statistical Analysis of Coal Mine Accidents in Penna., 1916-1922, incl.," by Rush N. Hosler, superintendent, Coal Mine Section, Pennsylvania Compensation Rating and Inspection Bureau, Harrisburg, Pa.; Table XX and XXIV same book and from supplementary information supplied by Mr. Hosler in correspondence. Mr. Hosler's data represents 1159, 1549 and 1743 in 1920, 1921 and 1922 respectively and in round numbers about 60 per cent of Pennsylvania's bituminous production or an approximate yearly average of 80,950,000 tons.

## Practical Calculus for Home Study

To most engineers who have graduated from a mining college, calculus is a study long forgotten, but many problems yield readily to its use and occasionally the engineer needs to use it. To those who wish to study it or brush up on it a book entitled "Practical Calculus for Home Study," by C. I. Palmer, associate professor of mathematics, Armour Institute of Technology, is commended as calculated to serve to make that study pleasant and productive. The author makes his explanations plain and the subject intriguing. He illuminates a form of knowledge regarding which American engineers have been only too indifferent but which will amply repay study. The book measures 4½x8 in., has 443 pp. and costs \$3. The publisher is the McGraw-Hill Book Co., 370 Seventh Ave., New York City.

MILL TAILINGS from the concentrator at Morenci, Ariz., of the Phelps Dodge Corporation, are being used for rock dusting the coal mines of that company near Dawson, N. M. The tailings are sacked and shipped to Dawson. No rock is being ground for the dusting of these mines.



# Mining Industries Especially Are in Need of Trade Associations\*

The Truth About Profits, Breadth of Ownership and Variations in Costs Between Mines Should Be Taught the Public—Internal Affairs Need Association Service Too

BY GOLDTHWAITE H. DORR  
New York, N. Y.

THE natural-resource industries employ something like a million and a half men and probably seven millions of our population are directly dependent on them for a livelihood. In terms of dollars, the annual flow of this stream meters well over four and a half billion. The number of those who as stockholders are furnishing the billions of capital necessary for the conduct of these enterprises probably is almost as great as the number of persons employed in those industries.

Some of us had occasion a year ago to gather statistics which showed with reasonable assurance that there are substantially 350,000 individuals who are direct investors in the bituminous-coal mines alone. Much of the capital in these natural-resource industries is furnished by bondholders and other indirect investors, so that the actual number of persons whose savings are at stake in their sound and successful conduct equals, as has been said, the number of wage earners employed in them. If people could be made to see this fact many misunderstandings of the public would be resolved that now create the gravest problems of trade associations in natural-resource industries. The public does not know the business facts of these industries.

It is the prime field of usefulness of a trade association to collect and distribute the facts of the industry—facts useful to the industry itself in the intelligent operation of its business, useful to the consumer in the intelligent operation of his business, useful to the public in understanding conditions in the industry and making decisions as to its own relations with that industry. But during the last four years public opinion and government have challenged the very exercise of this vital function of trade associations. Why do business men and economists fight for the exercise of this function? Why has it been attacked?

There has been in the last quarter century nothing short of a revolution in the conception of business by business men. Their horizon has widened enormously. Development of industry and the pressure of competition, national and international, has led to a conception

of business as a science, in which the careful analysis of all available facts is taking the place of rule-of-thumb, hit-or-miss methods.

Efforts have always been made by business men during times of broadening markets to find out what others were doing, but the very absence of normal means for

mutual information led to mutual distrust and to the use of questionable methods. This situation, which rendered business highly speculative and which was fraught with disaster to producer and consumer alike through ungoverned fluctuations, grew intolerable with the broadening markets in the decades after the Civil War. To escape from it business men at the end of the nineteenth century turned to the creation of combinations and huge corporations, which through their

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## THE TRADE ASSOCIATION'S "COMEBACK"

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Although vilified and blamed for profiteering and almost scrapped after the war, the legitimate trade association is now compelling itself upon industry and business by sheer merit, Mr. Dorr thinks. No less an authority than the U. S. Supreme Court is finding for it, as in the glass and sugar exchange cases last winter. It is now for the trade association to rise to the place that awaits it, especially in an industry composed of so many small units as is the coal industry, and satisfy the demand of business men for less blind recklessness and more science in their affairs.

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very size would have the necessary information to steer a sound business course. This tendency toward single large units probably would have fallen of its own immensity had its collapse not been brought about by the Sherman Anti-trust Law. It soon was discovered that on the whole it was more in accord with the genius of American institutions that there remain the initiative and competitive activity of smaller units.

But the need for *facts*—the common interest in having the facts in order that business might be conducted not as a poker game but in accordance with the scientific genius and bent of our people and of the age—made business men recognize that there was a common interest in gathering these facts. This led to the trade association. The need for their service, the sound economic results to be obtained were, before the Great War, clear to officers of government, the courts and business men alike. Indeed, the Federal Trade Commission at the start carried out the purpose for which it was set up—that of leader, helper and guide to business—by emphasizing, preaching and encouraging the trade-association movement, the collection and dissemination of current business facts.

But for the Great War the orderly development of this movement, it is fair to say, would have gone on. During the war industry generally came under the control of the government. At the end of the war, when that control was released, the inflation which had occurred during the war was followed by a secondary

\*An article constructed from an address delivered by Mr. Dorr before the natural resources production division of the United States Chamber of Commerce, Cleveland, Ohio, May 7.



period of still more extravagant inflation. Prices soared far beyond both war and pre-war levels. A general feeling of resentment spread through the country. Looking around for a cause of high prices the people blamed trade associations at once and charged them with some responsibility for profiteering.

As a result of a post-war witch-burning spirit, the trade association, a great accomplishment of American business men, a great piece of economic machinery, capable of serving producer and consumer alike, was attacked, vilified, discredited and almost scrapped. But I venture to say, that the tide has turned.

The Supreme Court during the past winter, twice has rejected unanimously the extreme interpretation of the Department of Justice of the Sherman Law in the important Glass and Sugar Exchange cases. There is no decision of the Supreme Court which holds that the collection and dissemination of trade information on the principles laid down by Secretary Hoover is in itself a violation of the Sherman Law, and I am prepared to venture the opinion that there never will be.

The particular facts common to natural-resource industries and having a direct bearing on trade-association activities in these industries should be reviewed.

#### ASSOCIATIONS CAN SERVE A COMMON INTEREST

Natural-resource industries are wasting industries. The most valuable mines will one day be worthless. From this it follows that methods of production and distribution and the economic organization of the industry should not be wasteful of the natural resource. Though the offense against conservation is more often waste in consumption than in production, nevertheless there is here a common interest within the industry itself and in the nation at large that trade associations in these industries should serve.

The interchange of technical information, so that the best available practices shall prevail, is important, and in this the trade organizations have been and can be of service, but there is the more fundamental problem that the industry shall not be so organized that there shall be in it recurrent extremes of oversupply and shortage. These produce a wastefulness in the production of the natural resource itself and of the nation's capital. To a solution of this phase of the problem the trade association can also contribute by the gathering and dissemination of trade information.

A second circumstance is that in these natural-resource industries there are multitudes of owning and producing units scattered over an enormous territory, often remote from market and having little opportunity to gage market conditions correctly. In bituminous coal, for example, there are over six thousand separate organizations. The larger units, perhaps, can, from their own wider experience, gage business conditions with reasonable accuracy, but the large number of small units are at a disadvantage unless the facts of the industry as a whole can be collected and disseminated among them through trade-association activities.

Third, there probably is keener and fiercer competition in natural-resource industries than in any other industries of the United States, and this competition often is carried to extremes that are destructive of the interests of owner, worker and consumer alike.

The public misconceptions which prevail as to the existence of competition in natural-resource industries are remarkable. We have the familiar popular myth of the coal trust in the bituminous industry, which

probably still persists in spite of ruinous prevailing prices and the finding of the Coal Commission that the industry is highly competitive, and that such periods of price inflation as have occurred were not in any way due to combination but to shortages in supplies due to the stoppage of production by strikes and transportation difficulties.

Trade associations in natural-resource industries can perform a very definite service in gathering and keeping before the public the facts as to their competitive nature; ultimately these facts will sink in.

Further, to a large extent the products of the natural-resource industries are standardized articles which under normal economic laws are bound to sell at uniform prices at the same time in the same market. No one factor has been more unintelligently used in the attack on trade associations during the last four years than the argument that because prices were uniform at the same time in the same market, therefore such uniformity was the result of combination and of the secret action of trade associations in these industries.

There are not many things on which all economists agree, but if there is one principle as to which there is complete agreement it is that standardized articles will be offered in the same market at the same price by substantially all competitors, and that if a shift in price level is made, whether up or down, by any competitor controlling an important part of the production, there will follow almost simultaneously a similar advance or recession in price by his competitors.

This economic law is merely the expression of economic observation of what takes place in any free market, whether in the market square of an old English town or in the national and international markets of the great standardized products of today. And yet men have been under indictment and tried criminally in the last few years for alleged combinations to control prices, upon no other basis than the fact that their industries were governed by this economic law.

Happily, the Supreme Court of the United States, in a recent case, seems to have recognized the existence of this economic principle in a way which will hereafter be extremely useful to industry in clearing up this fundamental misconception.

#### PHYSICAL DIFFERENCES AFFECT PRODUCTION COST

Finally, there is the significant fact peculiar to natural-resource industries that there results from the actual physical difference in the natural resource a wide difference in the actual operating cost of production. Here is what has happened: The wider margins between operating cost of production and selling price of the physically better mines have frequently been taken as typical of the industry as a whole. Looking merely at these prices, the public clamors that prices are extortionate and the result of combination, when analysis will show them to be normal competitive prices.

A fair test of whether a prevailing market price is a normal competitive price is whether or not a substantial portion of the product is being produced at or about cost. It is obvious that if the price falls below that point, before long a substantial part of production will cease, and the public will not get the material which it needs. If it rises above that point, new producers come into the business and the supply is abnormally increased.

If the facts of any of the natural-resource industries be analyzed for any substantial period of time, it can



be made entirely clear to the public that the prices in those industries are normal competitive prices. If they vary from normality, it will be more often that they are abnormally low than abnormally high.

For example, take soft coal: Last summer we succeeded in prevailing upon the U. S. Coal Commission to analyze the margin between operating production cost and sales price. For the year 1921, in sixty-seven bituminous fields more than 20 per cent of the tonnage was sold, not at or about the cost of production but actually below it; in twenty-one of these fields more than 50 per cent of the coal was so sold.

In a group of mines which had been operating continuously for ten years prior to 1917 and which had thus established their ability to live we found that, during this period, mines producing on an average of 19 per cent of the tonnage sold their product on an average at cost or less.

Those who are familiar with the natural-resource industries are well aware that this situation is not peculiar to the bituminous-coal industry but that an analysis of sales price and cost of all the natural-resource industries would show that a substantial amount of the product which the public requires is produced without margin between cost of production and sales price, or at an actual loss.

The gathering and analysis of figures along these lines can be made absolutely to convince the public that the prices prevailing in natural-resource industries are the normal prices of a highly competitive industry and which must prevail in order to obtain for it the product from them that it requires.

If price fixing were adopted by the government, it follows that price could not be set at a figure lower than that now obtained by competition. It is wholly unfair, therefore, either to take the margins between the operating cost of production and this normal competitive selling price which are obtained by the operators of the physically superior properties as typical of the industry or to denounce the operators of those properties as profiteers by reason of the wider margin they obtain.

#### HIGHER QUALITY ENTITLED TO BETTER PRICE

What is such an operator to do? Is he to sell his product at a price below the competitive market price? Does the producer of wheat on a rich bottom land sell his wheat at a price lower than that of his rival on a difficult upland because he gets more bushels from the acre with less labor cost?

The wider margin of the producer who has a physically superior mine or farm does not indicate that he is making a higher rate of profit, for the rate of profit that he earns is determined by the ratio of his margin between selling price and operating cost to the value of his property. The superior quality of his natural resource, whether it is a farm, a mine or a corner lot, means that it is worth proportionately more, and, ex-

cept in the case of the original appropriator, that he has, therefore, paid more for it.

Some have definitely urged that the government go back to the original expenditure made in the acquisition of any property, whether a mine, city real estate or a farm, and permit merely a return of 6 per cent on that original cost. This proposal is foreign to our whole scheme of economic life. Ownership of mines, farms and city real estate in our economic civilization is constantly changing on the basis of the present value of the property purchased. To restrict the valuation of the investment of the present owners of natural resources, whether land, mines or forests, to the actual expense to the original appropriator in the remote past would mean the taking of property from the present owner without compensation.

Further, there is this practical consideration: The development of our natural resources has been made with the expenditure of an enormous amount of individual initiative, hard work and actual sinking of savings; an enormous amount of this has reaped no reward whatever. It is only the hope of realizing a considerable reward, if successful, that has induced men and women to make the sacrifices they have made in the development of our natural resources. If that incentive for venturing were taken away, the net result to the public would be such a slackening of development of new properties as to result in a diminishing supply and far higher prices.

These facts, the A, B, C of anyone engaged in a

natural-resource industry, are not clear to the public generally, but they are of such a simple and elementary nature that it should be possible to make them clear, and it should be the task of the trade associations, as representative of these industries, to gather the necessary facts and bring them home to the public.

### Coal-Mining Industry Uses 87 per Cent Of Black Powder Output

The production of black blasting powder in 1923 is reported as 8,078,053 kegs, or 201,951,325 lb. This compares with a record production of 11,084,741 kegs, or 277,118,525 lb., of black blasting powder in 1917, according to a report by the Bureau of Mines.

Pennsylvania led in the consumption of black blasting powder, using 39,127,575 lb. Illinois, with a consumption of 37,179,825 lb. ranked second; Indiana, with 21,344,100 lb., was third; Kentucky, with 17,180,175 lb., was fourth; and West Virginia, with 14,817,050 lb., was fifth.

Of the total consumption of permissible explosives, 56,806,709 lb. was used in coal-mining operations, and of high explosives, other than permissible, 37,828,979 lb. was used in coal-mining operations. Of the total black blasting-powder production, 7,019,550 kegs or 175,488,750 lb., constituting approximately 87 per cent of the output, was used in coal-mining operations.

#### A CURE FOR "COAL BARONISM"

The American public probably does not know the story of coal, in spite of much recent publicity. It probably doesn't know that in 1921 20 per cent of the output of sixty-seven coal fields sold at less than cost and in twenty-one fields the proportion was 50 per cent. It doesn't know that a group of mines whose existence was sufficiently justified to keep them running during the ten-year period before 1917 sold 19 per cent of their product at a loss. Facts like these, if properly presented, should quiet the perennial public clamor for lower priced coal, Mr. Dorr thinks, and coal-trade associations ought to do the presenting.





# News Of the Industry



## Ascribe Loomis Blast to Electric Trolley Motors And Cigarette Smoking

*Special Dispatch to Coal Age*

Scranton, Pa., June 27.—State mine inspectors in their report to Joseph J. Walsh, Secretary of Mines, on the explosion at the Loomis colliery of the Glen Alden Coal Co., Hanover township, on June 6, which resulted in fourteen fatalities, ascribe the explosion to the use of electric trolley motors and the failure of employees to observe the anti-smoking regulations.

The inspectors declared they found the electric trolley motors in use in gaseous sections of the mine and discovered cigarette butts and burned match stems in the debris caused by the explosion.

The report by the mine inspectors confirms in part a report made by official investigators for the company who worked with and at the same time as the mine inspectors in seeking the cause of the explosion. The company investigators declared that the explosion was traceable only to the failure of the men to observe the "no-smoking" rule in the mine. This was based on the discovery of burned matches and cigarette butts.

An official of the company, who took a prominent part in the investigation declared that the use of electric trolley motors in the operation could not be ascribed as the cause of the explosion. He pointed out that no electric trolley motor was in operation in the section of the mine affected by the explosion at the time.

Among local coal mining men it is thought that the inclusion of the electric trolley motor as a cause of the explosion may have been written into the report by the mine inspectors to aid Secretary Walsh in his campaign against the use of electrically operated machinery in underground workings. Mr. Walsh has time and again protested against the operation of such equipment as electric trolley motors.

## British Coal Output Nearly At Pre-War Level

Nearly 71,333,000 tons of salable coal was mined in Great Britain in the first quarter of the current year, as compared with 71,667,000 tons in the previous quarter and 70,000,000 tons in the corresponding quarter of 1923, and about 73,000,000 tons in 1913. Shipments of coal abroad, exclusive of shipments to the Irish Free State, according to the Bankers Trust Co., amounted to 19,390,000 tons. This was about

## Democratic Platform's Plank on Mining

The Democratic presidential platform, adopted by the convention at New York June 28, does not contain a separate coal plank like that of the Republican party. The section on mining, which includes coal, is as follows:

"Mining is one of the basic industries of this country. We produce more coal, iron, copper and silver than any other country. The value of our mineral production is second only to agriculture. Mining has suffered like agriculture, and from the same causes. It is the duty of our government to foster this industry and to remove the restrictions that destroy its prosperity."

4,667,000 tons less than in the previous quarter and 2,750,000 tons less than the quantity shipped in the corresponding period of 1913. The quantity available for consumption at home was 49,200,000 tons, or 4,667,000 tons more than the quantity similarly available in the corresponding period of 1923 and 1,500,000 tons more than the quantity available in the first quarter of 1913.

The reduction in the quantity of coal exported was due to a fall in the demand from the Continent, caused in a large measure by the general resumption of work in the mines in the Ruhr coal fields. This substantial decrease in the foreign shipments was not accompanied by a general downward movement in prices. On the contrary, prices on the whole were well maintained and quotations for immediate delivery were higher at the end than at the beginning of the quarter. The mines were worked for 71.29 days out of a possible 78 days.

There was a slight improvement in the regularity of employment in the coal mines. In the first quarter of 1924, 1,206,000 persons, including clerks and salaried persons, were employed in and about the mines, an increase of over 7,000 on the previous quarter and of 89,000 over the number employed at the outbreak of the war. The earnings of workers in the first quarter of the year were rather less on the average than in the previous quarter. However, they were higher than in the first quarter of 1923. There were 310 persons killed and 1,316 persons seriously injured by accidents in and about coal and metalliferous mines. This compares with 313 killed and 1,358 injured in the corresponding quarter of 1923.

## Lease of Norfolk & Western By Pennsylvania Deferred

Lease of the Norfolk & Western R.R. by the Pennsylvania has been deferred, according to a statement by Samuel Rea, president of the Pennsylvania, following the meeting of the board of directors of that road, June 25. "The committee appointed by the Pennsylvania R.R. to consider a lease of the Norfolk & Western," Mr. Rea said, "reported to the directors that it had not reached any satisfactory conclusion on the subject and that further consideration of the matter should be deferred."

This statement followed one by A. C. Needles, president of the Norfolk & Western, the previous day to the effect that the Pennsylvania committee had made no offer for the lease of the property. Both railroads appointed committees to consider the lease, but so far as is known no joint meetings have been held.

First mention of the lease was made by the Pennsylvania to the Interstate Commerce Commission more than a year ago. Officials of the railroad made it clear at that time that the Pennsylvania, which owned a controlling interest in the Norfolk & Western, intended to lease it with the approval of the commission.

According to those in touch with the situation the careful consideration of the problem of leasing the Norfolk & Western convinced some of the members of the board of directors of the Pennsylvania that it would be a costly undertaking. These directors opposed the lease under present conditions. In the New York financial district the opinion was expressed that the announcement made by President Rea was to be taken simply as indicating that the lease would not be given serious consideration until next autumn.

## Sues Union for \$250,000

Mrs. Edna M. C. Major, widow of John I. Major, who was shot to death June 22, 1922, while employed at the Lafferty mine of the Union Coal Striping & Mining Co., filed suit, June 25 in the court at St. Clairsville, Ohio, for \$250,000 damages against the miners' union.

The petition is directed against the United Mine Workers of America, John L. Lewis, president, and William Green, secretary; District No. 6 of the organization, its officers, and Subdistrict No. 5 of District No. 6 and its officers.

According to the petition, Major came to his death at the hands of union miners.



## Peace River Coal Almost Equal to West Virginia's

There is good coal in the Peace River region of northeastern British Columbia—"practically the equal to the high-grade coals of West Virginia and Wales"—according to J. D. Galloway, Canadian Government engineer. Reporting on a long trip of investigation he made several months ago through the territory around what is known as the Peace River Block, he said that the coal is there and mining conditions should be good because of strong roof and floor. All the region needs is transportation and market. The nearest rail line is the westward extension of the Edmonton, Dunvegan & British Columbia R.R., more than 100 miles away. Says he:

"The Rocky Mountain Canyon coal field has been known for many years; leases were taken up in the area by Neil Gething as long ago as 1908. At the present time a syndicate consisting of Neil Gething, George Aylard, and R. F. Green holds forty leases, and another twenty are held by W. S. Johnston. In the immediate vicinity of the canyon no other leases have been taken up, and as the coal is under reserve none can be taken up at the present time. On the Carbon River, thirty miles above the head of the canyon, ten leases are held by C. F. W. Rochfort and partners.

### Strata Notably Regular

"One noteworthy feature of the field is the regularity of the measures. The freedom of the strata from any serious disturbance can be well seen along the canyon, where they extend for miles with almost regular strikes and dips. Dips of from 7 deg. to 15 deg. largely prevail, but in a few places the short limbs of small folds have dips up to 35 deg. Faults are almost entirely absent and the gentle folding of the strata which occurs in a few places is not such as to interfere appreciably with mining operations. It may be safely said that the structural conditions of the measures are such as to make mining operations almost ideal. As a rule the enclosing sandstones and shales above and beneath the coal seams are firm and solid, so that good mining conditions would generally prevail.

"The coal is of high grade. Most of it comes under the classification of semi-bituminous or high carbon coal. Apart from its high-carbon content this coal is noteworthy for its low ash content, which on the average is considerably lower than any of the coals now being mined in western Canada. The high rank of this coal, together with the low ash, makes it altogether an exceptional coal and practically the equal of the high-grade coals of West Virginia and Wales. Most of the coal in this area is non-coking, although certain bands within some seams and certain small seams are fairly good coking coal.

"Two more or less distinct types of coal occur in the field and in many instances a seam will contain a band of each kind of coal. The predominating type, which occurs in far the greater amount, is a hard, firm coal which is



Goldthwaite H. Dorr

Legal adviser of the Bituminous Coal Operators' Special Committee last year, whose address on trade associations, delivered at the annual session of the United States Chamber of Commerce, appears on another page.

dull, grayish and frequently greasy in appearance. This coal would easily stand long transportation without unduly breaking up. The analyses show it to be a high-carbon bituminous coal, with a fixed carbon content of from 70 to 80 per cent.

"The second type of coal is a bright-colored, jet, friable coal, which easily and readily breaks into small fragments. It frequently occurs as a bottom bench, from 6 to 12 in. thick, of a seam containing an upper, generally thicker bench of the dull coal. The jet coal usually is bituminous in rank and it has been found to be excellent blacksmith coal. It has a somewhat higher ratio of volatile combustible matter to fixed carbon than the dull coal and is generally fair coking coal.

"Various estimates of tonnage of coal in the Rocky Mountain Canyon field have been made, but in conclusion, it is enough to say that the tonnage and quality of coal in this field is quite satisfactory and all that is required is transportation and market."

## Coal Towns Safe and Sane

The Pacific Coast Coal Co. is not moved by any diabolical desire to ruin the Fourth of July for the boys of its coal towns. Coal towns will burn, however. Therefore the company has issued orders against all sorts of fireworks and explosives for Fourth of July use. Says a company statement posted at Black Diamond: "A fire might wipe out a town or do such damage that a mine would have to close down, throwing all in camp out of work. At this season of the year, when everything is so dry, the danger of fire is intensified and extra precautions must be taken. It is urgently requested that parents explain to their children why this precaution must be taken."

## Reading Coal Co. Earned \$4,068,694 in 1923

The Philadelphia & Reading Coal & Iron Corporation and its subsidiaries report gross sales of \$89,195,635 for 1923, against \$52,786,120 in 1922. After allowing for all expenses and other deductions, the company reported operating income of \$10,512,976 against \$2,261,415. After crediting other income, and allowing for depletion, taxes and other charges, the company shows net income of \$4,068,694, against a deficit of \$93,430 in 1922. The net income for 1923 was equal to \$2.90 a share earned on the 1,400,000 shares of no par value capital stock outstanding. In his statement to stockholders W. R. Richards, president of the corporation, said in part:

"Total production of anthracite from lands owned, leased and controlled by the Philadelphia & Reading Coal & Iron Co., for the year ended Dec. 31, 1923, was 11,488,513 tons, compared with 6,924,284 tons mined during the previous year. The company mined 10,222,202 tons and sold 9,835,474 tons as compared with 6,100,869 tons mined and 7,398,974 tons sold the previous year. Low tonnage of 1922, both as to production and sales, is attributed to the 1922 strike.

"The funded indebtedness has been reduced by payment of Philadelphia & Reading collateral sinking fund loan of \$30,000. Reforestation of lands is progressing favorably. During the year 225,000 young trees were planted and protective measures for elimination of danger of forest fires are now being carried forward energetically."

## West Virginia Mines Yielded 87,031,408 Tons in 1923

West Virginia coal mines produced 87,031,408 gross tons of coal in 1923, according to figures compiled by the State Department of Mines. The output by counties, compared with 1921 and 1922, was as follows, in gross tons:

County	1921	1922	1923
Barbour.....	1,548,949	817,057	2,149,618
Boone.....	1,475,721	958,912	1,388,562
Braxton.....	235,537	213,108	292,144
Brooke.....	1,574,050	1,369,276	1,741,258
Clay.....	488,778	741,608	694,813
Fayette.....	7,846,189	4,418,605	7,386,368
Gilmer.....	86,884	115,808	96,879
Grant.....	242,712	74,663	140,675
Greenbrier.....	52,153	475,601	431,643
Harrison.....	5,247,547	2,629,886	5,568,930
Kanawha.....	5,209,368	2,424,518	4,612,552
Lewis.....	67,266	115,808	99,625
Lincoln.....	272,994	160,309	134,287
Logan.....	10,367,205	13,645,970	10,679,024
Marion.....	5,019,933	1,230,668	5,044,613
Marshall.....	1,067,241	1,116,798	1,506,813
Mason.....	242,480	48,253	80,203
McDowell.....	15,124,423	15,180,421	14,215,518
Mercer.....	2,325,396	3,174,504	2,508,492
Mineral.....	367,148	157,515	443,642
Mingo.....	1,095,828	2,061,210	2,928,860
Monongalia.....	4,398,929	5,764,558	6,372,937
Nicholas.....	212,086	284,818	368,587
Ohio.....	1,418,053	1,310,830	1,872,528
Preston.....	1,439,506	939,869	2,182,164
Putnam.....	260,102	170,552	365,047
Raleigh.....	7,728,329	7,518,550	7,688,452
Randolph.....	775,869	369,730	702,554
Summers.....	27,818	7,915	17,490
Taylor.....	759,236	310,798	796,005
Tucker.....	1,068,257	478,134	712,830
Upshur.....	599,335	525,555	798,715
Wayne.....	56,344	69,206	172,351
Webster.....	5,238	16,908	39,288
Wyoming.....	1,329,700	1,481,103	1,534,351
Small mines....	700,000	700,000	1,000,000

Total gross... 80,756,604 70,888,203 87,031,408



## Imports of U. S. Coal Exceed British at Rio de Janeiro

Imports of coal at Rio de Janeiro during February, 1924, according to a report by Consul General A. Gauvin, Rio de Janeiro, amounted to 55,351 metric tons, in comparison with 56,513 and 47,640 during the corresponding months of 1923 and 1922. This is the first month since the middle of 1923 that the United States leads in the Brazilian coal imports, 30,567 metric tons having come from that source and 24,784 from Great Britain. The following table shows the coal imports at this port during the first two months of the years 1922, 1923 and 1924, in metric tons:

	1922	1923	1924
United States	13,772		78,468
Great Britain	76,515	109,006	88,919
Totals.....	90,287	109,006	167,387

## Conferences at 19th Hole?

What is believed to be the first golf course for "miners only" has just been established by men at the Powderly colliery of the Hudson Coal Co. in Carbondale, Pa. The course can be used free of charge by all of the 22,000 Hudson Coal Co. miners in the section.

During the month under review the coal imports were classified as follows: 40,768 tons of steam coal, 13,964 tons of gas coal and 619 tons of foundry coke.

Of the coal from the United States, 24,195 tons was shipped from Norfolk and 6,372 tons was loaded at Philadelphia.

## Navy Awards More Contracts

Additional contracts for bituminous coal for navy yards and naval stations during the fiscal year beginning July 1 have been announced by the Bureau of Supplies and Accounts, Navy Department, on the basis of proposals opened May 21, as follows:

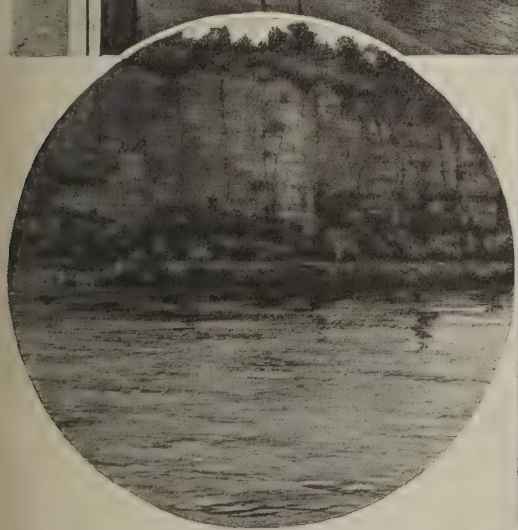
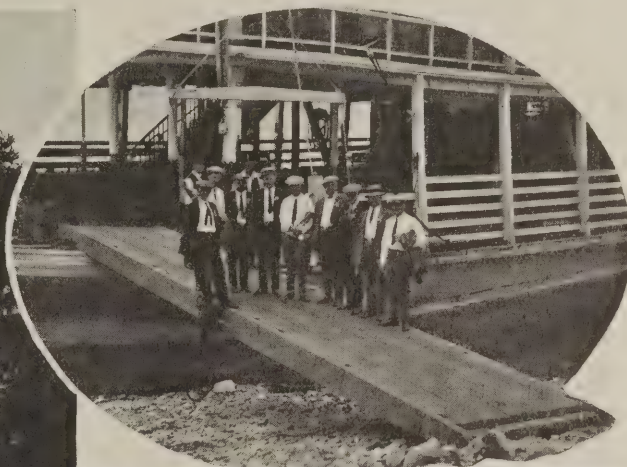
Coleman & Co., Inc., Philadelphia, 20,000 tons for delivery at New York at \$5.37 delivered under chutes, \$5.57 delivered alongside vessels and \$6.37 delivered in New York harbor and unloaded.

New England Coal & Coke Co., Boston, 30,000 tons run of mine for delivery at Boston, at \$5.85.

Maryland Coal & Coke Co., Philadelphia, 25,000 tons run of mine for delivery at Philadelphia, at \$4.90.

W. C. Huber & Co., Philadelphia, 35,100 tons run of mine for delivery at Annapolis, at \$5.19.

## Sidelights on the Three-Day Cruise of the Illinois Mining Institute on the Mississippi River



### A Mississippi River Metropolis Where the Illinois Mining Institute Made a Landing

At Grand Tower, near a new gigantic power plant supplying current for many southern Illinois mines, the party went ashore, rode inland 12 miles and visited the plant of the Atlas Powder Co.

### There Are Some Palisades Along the Mississippi

Rock walls 50 ft. high form the west bank of the Father of Waters for several miles below St. Louis, Mo., where the Illinois Mining Institute's boat trip started June 12. Most of the banks are just plain mud, however, on which the shallow-draft steamboats can shove their bows with ease to pick up passengers or freight.

### Parts of "The Gang" Going Aboard After a Stop at Cairo, Ill., World's Hottest Town

When the boat gets under way a gentle wind sweeps from end to end of the meeting room. Moreover the conventions which restrain one in a session in the ballroom of a hotel hamper no one on a river boat, and if perhaps there is less order there is more comfort and a larger degree of bonhomie.

### All Out! End of the Line!

Here we see the Illinois Mining Institute debarking on the old river levee at St. Louis, Mo., Sunday morning, June 15, after three days of cruising down to Paducah, Ky., and back.



### Delay Costs Lehigh Valley Stockholders \$600,000

Holders of 18,000 shares of Lehigh Valley R.R. stock have lost \$600,000 through their failure to exercise within the required time limit their right to subscribe for stock of the Lehigh Valley Coal Co. under the segregation plan of the two corporations, as ordered by the U. S. Supreme Court.

The stockholders were entitled to one share of coal stock at \$1 each for each share of railroad stock owned. The market price of the coal stock is \$34 a share. The railway company mailed out the rights three months ago, fixing the time limit for exchange at 3 P.M. Monday, June 16, 1924. The owners of 18,000 shares failed to execute their rights by that time and this stock now goes to the coal company at \$1 a share.

Since the expiration of the time limit some of the tardy stockholders have sent various excuses to the trustees. The executor of an estate holding 120 rail shares said that he was "away and ill." His delay was said to have cost the estate \$10,560.

### Italy Imports More Coal From the United States

During the first quarter of the current year Italy imported 155,508 tons of coal from the United States against only 160 tons for the same period in 1923 and 50,000 tons in 1922, according to advices to the Department of Commerce from Commercial Attaché McLean, Rome. This increase, despite the relatively small quantity involved, is significant, reflecting the results of persistent efforts on the part of new firms to introduce American coals on the Italian market, Mr. McLean states. The keenness of British competition has been considered by many to be insurmountable, but the figures speak for themselves and of late a number of American coal firms have been showing a growing interest in the possibilities offered by the Italian market.

During the full calendar year 1923 the United States shipped 486,112 tons of coal to Italy against 128,443 tons, in 1922. If exports are maintained for the remainder of the current year at the same rate as during the first quarter the total for 1924 will be 620,000 tons.

Italy's total imports of coal for the first three months of 1924 were slightly below the figures reached in 1923. The following table shows the shipments by the various countries in tons:

#### Italy's Imports of Coal by Countries

Country	First Quarter		
	1924	1923	1922
France.....	123,533	111,295	73,019
Germany.....	123,412	19,533	22,766
Germany (reparation)	298,353	482,372	450,275
Great Britain.....	1,262,334	1,447,179	1,136,112
Jugoslavia.....	3,882	4,287	1,573
United States.....	155,508	160	50,381
Others.....	6,899	3,116	6,231
Totals.....	1,973,921	2,067,942	1,740,357

### Lehigh Valley Coal Miners Abjure Outlaw Strikes

Scranton, Pa., June 30.—Having voted to outlaw petty strikes in the future, miners employed by the Lehigh Valley Coal Co., last night announced their intention of seeking an immediate conference to impress upon officials of the company their desire to observe the conditions of the existing wage agreement.

The menace of petty strikes to which the anthracite industry has been exposed is being eliminated, the spokesman of the general grievance committee of the Lehigh Valley miners declared. He endorsed the action of President John L. Lewis in sending an investigation committee to the hard-coal fields.

During the past week general grievance committees representing the following companies voted to refrain from calling petty "outlaw" strikes: Pennsylvania and Hillside, Glen Alden, Hudson and Lehigh Valley. Under the terms of the promise, the men at operations of these companies will not quit work until they have laid their troubles before accredited union officials, who will then decide whether there has been a violation of the contract by the operators.

The promises were made to the investigating committee which attended all of the meetings of the general grievance committees.

### A. I. M. E. Perfecting Program For Birmingham Meeting

Arrangements for the autumn meeting of the American Institute of Mining and Metallurgical Engineers, at Birmingham, Ala., Oct. 13, 14 and 15, are well under way, the following tentative program having been arranged:

A special train will leave Washington Oct. 7 at midnight for the Shenandoah Valley, stops being made at Luray, the Grottoes of the Shenandoah and Natural Bridge. The evening of the 8th will be spent at Roanoke.

On Oct. 9 the party will breakfast while following the banks of the New River on the way to the Pocahontas coal fields of West Virginia. The day will be taken up with a trip through the field, stops being made at some of the mines and tipples and provision being made for those desiring to go underground. A smoker and dance will be given at Bluefield in the evening.

The morning of Oct. 10 will be spent at the Mascot Mines of the American Zinc Co. of Tennessee, with an opportunity for going underground and to examine the mill and byproducts plant. In the afternoon the party will inspect the marble quarries and mills in the vicinity of Knoxville. The next day, Oct. 11, will be devoted to inspection of the mines, mills, smelters and acid plants at Copperhill and Ducktown.

The first day of the meeting at Birmingham will be devoted to technical sessions, morning, afternoon and evening. The mining of coal and iron in Alabama and the smelting practice of the Birmingham district will be the main topics of discussion, but opportunity will be afforded for the presentation of other subjects.

### Reduction in Insurance For Rock Dusting

State	Per \$100 of Pay-roll, Cents	State	Per \$100 of Pay-roll, Cents
Alabama.....	20	Michigan.....	10
Colorado.....	20	Montana.....	13
Georgia.....	10	New Mexico.....	20
Illinois.....	10	Oklahoma.....	20
Indiana.....	10	Tennessee.....	11
Iowa.....	10	Texas.....	10
Kansas.....	13	Utah.....	14
Kentucky.....	18	Virginia.....	10

If for instance, the rate for a mine has been \$3 and it is located in Alabama, the rate will be reduced to \$2.80 if the mine is properly rock dusted. The saving will be somewhere around \$6 per day. Pennsylvania, Maryland, Ohio and West Virginia, which are state-fund states, are not included in this list. The Inspectors' Committee of the Pennsylvania Rating Bureau has recommended, it is understood, that the deduction be placed at 10c. in that state. The figures have been determined upon the history of mine explosions in the several states.

### Byproduct and Beehive Coke Output Low for May

Production of both byproduct and beehive coke declined during May, due principally to a sharp decrease in the output of pig iron. The quantity of byproduct coke produced was 2,786,000 net tons against 3,010,000 tons in April. Production of beehive coke declined from 1,079,000 to 761,000 tons. In terms of per cent the decrease was sharpest for beehive coke, next for pig iron, and last for byproduct coke. The output for beehive coke fell off 29 per cent, the output of pig iron 19 per cent, and the output of byproduct coke 7 per cent. The average daily production of byproduct coke was 89,855 tons as against 100,326 tons in April, a decrease of 10.4 per cent. Of the 71 plants in existence, 66 were active and 5 were idle. The ratio of production to capacity was 74.5 per cent.

### Monthly Output of Byproducts and Beehive Coke in the United States<sup>a</sup>

	(In thousands of net tons)		
	Byproduct Coke	Beehive Coke	Total
1917 monthly average..	1,870	2,764	4,634
1918 monthly average..	2,166	2,540	4,706
1919 monthly average..	2,095	1,638	3,733
1920 monthly average..	2,565	1,748	4,313
1921 monthly average..	1,646	462	2,108
1922 monthly average..	2,379	714	3,093
1923 monthly average..	3,127	1,497	4,624
March, 1924.....	3,221	1,343	4,564
April, 1924.....	3,010	1,079	4,089
May, 1924.....	2,786	761	3,547

(a) Excludes screenings and breeze.

### Estimated Monthly Consumption of Coal for Manufacture of Coke

	(In thousands of net tons)		
	Consumed in By-product Ovens	Consumed in Beehive Ovens	Total Consumed
1920 monthly average..	3,684	2,665	6,349
1921 monthly average..	2,401	706	3,107
1922 monthly average..	3,421	1,107	4,528
1923 monthly average..	4,458	2,358	6,816
March, 1924.....	4,627	2,118	6,745
April, 1924.....	4,324	1,702	6,026
May, 1924.....	4,002	1,200	5,202



## Burns Bros. Earn \$1,305,311 In Fiscal Year

Net profits of Burns Brothers, of New York City, for the fiscal year ended March 31 last, were \$1,305,311 after depreciation and taxes. After allowing for dividends on the preferred stock the balance was equivalent to \$10.30 a share earned on 80,944 no par shares of class "A" common and \$2.30 a share on 80,940 no par shares of class "B" common. This compared with \$1,140,028, or \$9.18 a share, earned the previous year on the "A" stock and \$1.18 on the "B" common.

The company's consolidated income account for last year compared with that of the previous year as follows:

	1924	1923
Net sales	\$30,295,586	\$29,432,807
Cfts. and deposit	27,739,236	26,799,944
Gross profits	\$2,556,350	\$2,632,863
Expenses and taxes	1,581,073	1,909,782
Profit	\$974,577	\$723,081
Other income	330,734	416,947
Net profit	\$1,305,311	\$1,140,028
Pr. pref. dividends	74,935	90,447
New pref. dividends	210,000	210,000
Com. dividends A	809,165	809,159
Com. dividends B	161,757	161,827
Surplus	\$49,454	\$131,405

On March 31 the company had \$2,395,526 cash, \$4,925,318 accounts receivable and coal and supplies on hand valued at \$1,255,952. Accounts payable amounted to \$1,894,975.

At the annual meeting of the board, June 12, Charles Hayden, of Hayden, Stone & Co.; William J. Wason, vice president of the Kings County Trust Co., and Alfred T. Holley, coal and feed dealer of Hackensack, N. J., were elected directors of Burns Brothers to fill two vacancies and that created by the retirement of C. R. Runyon. The other directors were re-elected.

## Maps of Superpower Survey Soon Available

The seventeen plates prepared by the Federal Power Commission in connection with the superpower negotiations being conducted by Secretary Hoover are now in the hands of the lithographers. Copies will be available for distribution soon.

The plates being made of maps and curves will be accompanied by a short text, setting forth the findings and conclusions of the engineers who assembled the data. The growth of population and of power consumption in each of the states covered and for the entire eastern section of the northeastern area will be shown. Generating capacity, power loads, hydro-electric possibilities, transmission lines and coal deposits will be shown.

The information set forth in these lithographs will be of particular value to everyone interested in power since it concentrates in graphic form information from several federal agencies and from the states included in this survey.

The fifteen states included in the survey produce half the country's output of power.



A. C. Fieldner

Superintendent of the Pittsburgh station of the U. S. Bureau of Mines, who sailed June 19 for London to attend the world power conference.

## Coal Output of Russian Mines Exceeds Program

Gross output of coal by all the coal trusts of Russia during the first six months of the fiscal year 1923-24 (Oct. 1, 1923, to April 1, 1924), according to the *Russian Review*, totaled 362,178,000 poods (a pood is equal to 36.113 lb.), which is 11 per cent in excess of the program and 44.8 per cent more than the output for the corresponding period of the previous year. Of this amount, 69,100,000 poods, or 17 per cent of the output, was used for the needs of the trusts, which is considerably less than the amount used for the same purpose last year.

Shipments from the mines totaled 203,000,000 poods, compared with 187,800,000 poods last year. The increase in shipments, however, is not in proportion to the output, for supplies at the mines were estimated on April 1, 1924, at 1,919,900,000 poods.

## Germany Protests Against French Troops in Sarre

Germany has lodged a protest with the League of Nations against the French military occupation of the Sarre coal field, in which France was given exclusive mining rights for fifteen years by the Treaty of Versailles. The Teuton government complains that the continued presence of French troops will exercise an unfortunate moral influence upon the plebiscite which will decide the future of the Sarre territory at the end of the fifteen-year period. Germany requests that the French occupation be brought to an end and that a local gendarmerie be constituted to take the place of the French forces on police duty.

The Council of the League of Nations, in session at Geneva, Switzerland, June 11, postponed action on the note until the August session, but it adopted a resolution expressing satisfaction with the Sarre Governing Commission for increasing the gendarmerie in compliance with the wishes of the council.

## Docks Get Little Coal in First Part of Summer

Although movement of coal to the Northwest by the Lakes picked up noticeably after the Interstate Commerce Commission made its recent Northwest rate decision favoring dock shippers, the amount of coal put on the Duluth-Superior docks up to June 1 was only a little over half that of the corresponding period in 1923. Total soft-coal receipts to May 31 were but 996,161 tons this year as compared with 1,832,344 tons last year. Hard-coal receipts were 41,084 tons less than in the same period of 1923 and soft-coal receipts 795,099 tons less, as indicated in the following tables of comparative receipts:

### HARD COAL

	Net Tons
April, 1924	84,392
May, 1924	80,240
Total to May 31, 1924	164,632
Total to May 31, 1923	205,716

### SOFT COAL

April, 1924	240,018
May, 1924	591,511
Total May 31, 1924	831,529
Total May 31, 1923	1,626,628

### TOTAL HARD AND SOFT COAL

April, 1924	324,410
May, 1924	671,751
Total May 31, 1924	996,161
Total May 31, 1923	1,832,344

## Austrian Coal Output Gains

Austrian coal production in January, 1924, according to a report from Assistant Trade Commissioner Prentiss M. Terry, Vienna, amounted to 15,662 tons of pit coal and 275,533 tons of lignite, a total of 291,195 tons, as compared with 14,014 tons of pit coal and 239,673 tons of lignite in December, 1923, a gain of 14.8 per cent.

The 291,000 tons of coal produced in January, 1924, exceeded the average monthly production of 1923, which amounted to 234,700 tons, by 56,000 tons or 24 per cent.

Output of Austria in 1923, by provinces, together with the January, 1924, output and the share of each province in the increased production was as follows, in metric tons:

State	Year 1923	Jan., 1924	Increased Output Over 1923 Monthly Average
Styria	1,575,047	161,925	30,000
Upper Austria	355,297	43,167	14,000
Lower Austria	329,221	32,254	4,000
Burgenland	435,577	39,975	4,000
Tyrol	36,912	2,710	
Carinthia	85,037	11,164	4,000
Total	2,817,091	291,195	56,000

Imports into Austria during 1923 totaled 3,755,210 tons of pit coal; 865,010 tons of lignite and 403,176 tons of coke.

Total Austrian consumption of mineral fuel in 1923 amounted to 7,814,780 tons as compared with 9,084,945 tons in 1922, a falling off of 1,270,165 tons or 14 per cent. Of the total consumed, 2,791,384 tons, or 36 per cent, was produced by domestic mines and 64 per cent was imported.



## Discussion

### Did Mine Inspectors Demand Too Little?

More Inspectors Needed—Every Mine Should Be Treated as Gaseous—  
Mechanical Inspectors Should Examine Equipment  
Every Thirty Days

AN ARTICLE in *Coal Age*, May 29, 1924, entitled "Mine Inspectors' Institute Advocates Legislation, etc." contains a list of the demands in the interest of safety.

These demands are good, but the inspectors might have added some more of great importance if their purpose had been to give a complete review of present safety needs in coal mines, as anyone will realize who is familiar with the history of coal mines in America and considers the many fatal mine explosions and mine fires that have occurred, some of them quite recently. If the article as it appeared in *Coal Age* is a complete record of the inspectors' deliberations at the institute it seems that some one must have clapped a muzzle on them. Here are a few regulations that should be considered:

(1) Prohibit the granting of second-grade certificates for mine foremen. (2) All mines should be considered gaseous and be examined prior to the entry of miners. (3) The use of electric haulage motors should be prohibited in pillars. (4) Exhaust ventilation should be provided in all mines. (5) Electric hoists should be prohibited in rooms and pillars. (6) No electric

hoists should be permitted in entries except on intake airways and all should be of the explosion-proof type and set at least 100 ft. outby from the last crosscut. The rope should not be allowed to come in contact with any metal or steel that would cause an arc. (7) All pillars should be ventilated by a separate split and no return should be allowed to travel into other live entries or pillars. (8) Where force fans are used drill holes should be put down from the surface to all pillar sections.

(9) Escape and ventilation shafts or slopes should be provided in all mines driven a distance of one mile or more from the nearest entry. (10) All electric apparatus should be of the explosion-proof type and operated and installed only in intake airways. (11) Inspectors should be equally responsible with the mine management for the enforcement of safety in and about all coal mines. (12) At least one full crew of first-aid and mine-rescue men should be provided at every mine. (13) A mechanical inspector should examine all machinery in and about coal mines at least once every three months. (14) Enough mine inspectors should be provided to allow every mine to be examined at least once every sixty days. Du Bois, Pa. ALFRED ENGELL.

### Two Provinces Seek to Fill Canada's Coal Bins

I have read with interest a reading notice that appeared in the *Montreal Star* on Monday. It quoted from an article by M. D. Geddes as published in *Coal Age*. This article dilated on the coal resources of Canada and the possibility of the United States discontinuing the shipment of anthracite across the international line.

Mr. Geddes referred specially to Alberta and dilated on the tremendous quantity of coal available in that province. However, for some time at least, it will not be practicable to bring that coal to Ontario and Quebec, and Ontario particularly is the point which suffers from its dependence on United States coal. We are inclined to think that the first relief will come from Nova Scotia and that coal will be shipped by water to Montreal and possibly, pending the enlargement of the canals, trans-shipped to smaller vessels and on to Ontario.

Though the coal in Nova Scotia is all bituminous, some of it is of the highest quality. In business the practice is to take the course of least resistance and it seems to me that the

first thing for Canada to do would be to use Nova Scotia coal so far as possible. Some day in the near future large coking plants will be erected at Montreal and Toronto where Nova Scotia coal will be turned into coke and thus a fuel that will supplant anthracite will be available.

W. A. MACKENZIE,  
President.

W. A. Mackenzie & Co., Ltd.,  
Toronto, Can.

### Here Is a Difficult Problem

At the mine we are working, the coal is of splint structure with the following average section: hard slate top, drawslate, 10 in.; fine grade of coal, 48 in.; soft slate, 4½ in.; coal, 4½ in.; mixed slate and coal, 5½ in.; coal, 11 in.; sandstone bottom. The soft slate immediately underlying the 48 in. of coal will not support the weight of an undercutting machine of the shortwall type without the aid of steel skids. It is also so soft that a loader cannot be permitted to use his shovel on the bottom. Can any reader of *Coal Age* suggest a suitable method of operation?

WEST VIRGINIA OPERATOR.

### Old Men More Subject Than Younger to Accidents

In the article "Old Men More Subject Than Younger to Accidents" in the issue of June 26, 1924, my meaning and that of T. T. Read has been misinterpreted. In the 28th line, second column, "accidents away from the mines" has been written "accidents in other industries" instead of "non-occupational accidents among miners." Similarly "Other Accidents" should read "Non Occupational Fatalities of Miners" and not "Fatalities of Others." In some other places the same misinterpretation occurs. The figures from the report of the Registrar General, Great Britain, should be used in every case to compare the fatalities of miners at the mines and away from the mines with each other and by wage groups "Frequently" on line 37, col. 1, should read "Frequency" and "about" on line 19, col. 2, should read "above." The figure 8 in the fourth column of the table though out of line with the other figures is correctly quoted.

W. W. ADAMS,  
Statistician.

U. S. Bureau of Mines,  
Washington, D. C.

### Saves One-Third of Powder, Not Two-Thirds

An error for which the editor is not to blame appears in my paper on "Increasing Lump Coal Production by Cushioned Blasting," published in your issue of May 29. On page 805, second column, line 11, the figure given should be two-thirds instead of one-third. The whole sentence which refers to the tests made with rock-dust stemming at an Illinois coal mine should, therefore, read as follows: "The shots made by this method with about two-thirds of the original powder charge brought down the coal satisfactorily with appreciably less screenings than are generally obtained."

J. H. HORLICK, JR.,  
Manager service division,  
Hercules Powder Co.

Wilmington, Del.

### Queer Mine Names

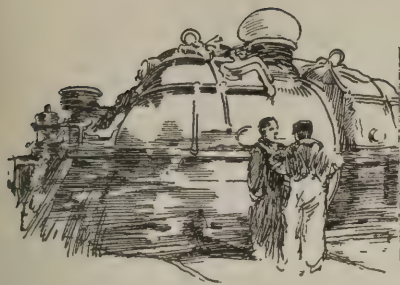
Speaking of queer mine names, I recall those of two little mines that were operated a few years ago when I was district mine inspector, which I believe will compete favorably with the "Struggling Monkey" mine, mentioned in the item that appeared in *Coal Age* Dec. 27, p. 968; or the "Toadvine," or "Who'd 'a' Thought," in the issue of Jan. 24, p. 151, and are entitled to a place in the front ranks of the list of queer mine names.

The first is a little mine operated by the Dayton Coal & Iron Co. on its branch line two miles north of Dayton. It was called the "Tickle Gizzard" mine. Another little mine, located in Scott County and operated by the Paint Rock Coal Co., went under the name of the "Possum Jaw" mine.

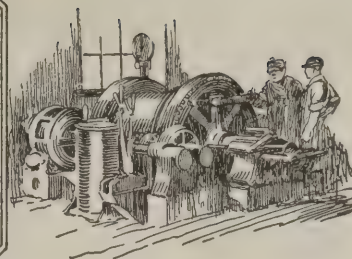
JOHN ROSE.

Dayton, Tenn.





## Practical Pointers For Electrical And Mechanical Men



### How to Use Grinding and Polishing Wheels

The Whole Peripheral Surface of the Wheel  
Should Be Used—Ways to True Up the Wheel  
—Putting a New Face on the Polisher

BY GUSTAV RADEBAUGH  
Urbana, Ill.

EVERY grinding stand should be provided with a safety hood and with a grinding rest that can be adjusted readily. It is important that the grinding rest be adjusted so as to be close to the wheel at all times. In many grinding operations the job is often of such size that it can easily be caught between the rest and the wheel and cause injury to the operator. The grinding rest and hood shown in Fig. 1 gives a good example of a well-protected wheel. When grinding, the top of the wheel should always turn towards the operative, and the work should be moved over its entire face. Often on the inspection of a grinding wheel it will be found that the face is uneven, which makes it difficult to do good work. This is caused by holding the material being ground steadily in one position. One of the most common improper practices is grinding a rod as shown in Fig. 2.

In cutting threads on rods the die will start more easily if the end of the stock is pointed to receive the die. The easiest way to do this is on the grinding wheel. There is no need, however, for wearing the wheel unevenly, if the rod is moved across the face as previously explained. Never hack or gouge a wheel, for in so doing it may be cracked to such an extent that it will break when in service.

When the wheel does not cut as freely as it should and the work heats quickly, the wheel probably needs dressing. This can be done with the grinding-wheel dresser. It is well

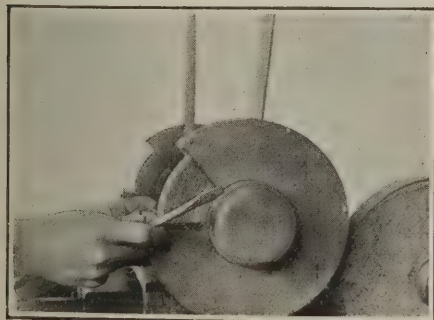


Fig. 1—Adjusting the Rest

If there is much space between the wheel and the rest material will easily get jammed, endanger the operative and probably break the wheel.

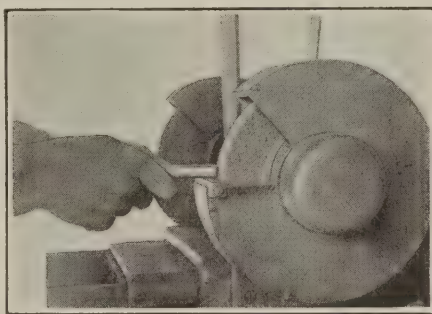


Fig. 2—Tapering a Rod

Unless the whole working surface of the wheel is used uniformly frequent truing will be necessary. Always move the material being ground across the face of the wheel.

to have a dresser always at hand and ready for use, because it is of utmost importance to keep the wheel sharp and perfectly true. One style of dresser is shown in Fig. 3.

I have found that a more accurate job can be done if the dresser is held in such a position as to bring the lugs on the bottom of the dresser against the grinding rest. If the wheel is running out of true, two definite centers having been established, the dresser being held in this manner the high spots will be removed. It is evident that if the dresser is not held immobile the wheel will not be properly dressed, for the dresser then will follow the peripheral shape of the wheel instead of correcting it.

If a commercial dresser is not available a good dresser can be made with a steel handle supporting five or six  $\frac{1}{8}$ -in. washers on a bolt. This improvised dresser is not the best for truing a wheel but it will sharpen it satisfactorily. If too much dressing is necessary it is an indication that the wheel is too hard for the work or that it is being run at too high a speed. If the proper grade of wheel is used it should run at a peripheral speed of 4,000 to 6,000 ft. per minute. Referring to the table, the diameter of the wheels and the revolutions per minute of the spindle are listed which give peripheral speeds of 4,000, 5,000 and 6,000 ft. per minute.

When grinding very soft metals, such as lead, aluminum, or brass, the wheel, if not specially made to cut

Table of Grinding-Wheel Speeds

Diameter Wheel Inches	Peripheral Speeds		
	4,000 f.p.m. Expressed in r.p.m.	5,000 f.p.m. Expressed in r.p.m.	6,000 f.p.m. Expressed in r.p.m.
4	3,820	4,775	5,730
6	2,546	3,183	3,820
8	1,910	2,387	2,865
10	1,528	1,910	2,292
12	1,273	1,592	1,910
14	1,091	1,365	1,637
16	955	1,194	1,432

these soft metals, will become "loaded" and will not cut. A wheel is said to be loaded when the pores of the wheels are partly or entirely clogged with the material being ground. This prevents the wheel from cutting and causes excessive heating. If the wheel is loaded the surface will show it plainly. This is caused by the wheel being too hard or the speed too slow or of improper grain and bond. To overcome this, increase the speed or use a softer wheel.

#### POLISHING AND BUFFING WHEELS

Polishing and buffing wheels made from sheepskin, canvas and wood are only a few of the soft wheels used for polishing and buffing. These wheels are revolved on the grinding stand at a little higher speed than the grinding wheel. The manufacturers of these soft wheels recommend that they be run at a peripheral speed of 7,500 ft. per minute. Every mine repair shop should be supplied with one or more soft wheels.

Such wheels can be resharpened by applying new abrasive material. This is done by applying glue as shown in Fig. 4. After a good heavy coat of glue is placed on the wheel it is rolled in a box, as shown in Fig. 5, which contains abrasive material. It will pay to make up a neat substantial box for this purpose as it is essential that the surface on which the abrasive material is placed be true and close grained.

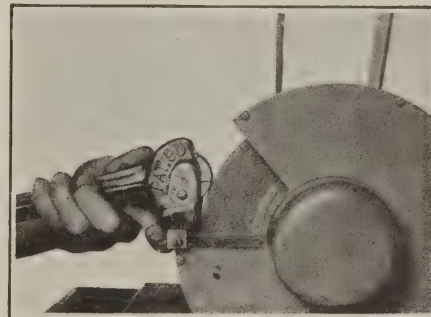


Fig. 3—A Dressing Tool

This device is used to straighten the cutting surface of the wheel. By holding the dresser on the rest the work can be done with greater accuracy.



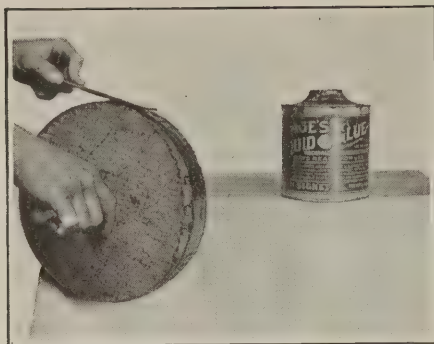


Fig. 4—Applying Glue to Wheel

When polishing wheels become dull and fail to smooth the surfaces exposed to their rotating action, glue is applied to them to hold new abrasive material.

It is always well when rolling the wheel to apply considerable pressure because this has a tendency to force the grinding crystals well into the glue. After the wheel has been well rolled and the abrasive crystals cover the entire face, it is good practice to roll the wheel over a smooth board applying considerable pressure on the wheel. This will even up the face and

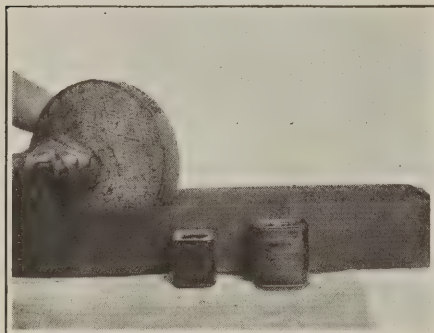


Fig. 5—Roll Wheel in Abrasive

A box is constructed of close grained wood with a smooth bottom. The bottom of this box is dusted with abrasive, and the wheel just glued is rolled in the dust under pressure.

cause the crystals to hold more firmly on the wheel when in use.

The abrasive crystals for soft wheels can be purchased in cans containing from  $\frac{1}{2}$  lb. up to 10 and 20 lb. The most common sizes for polishing range from 20 to 80 grain. There are few jobs in general repair work requiring any finer grade than No. 80. Grain sizes of abrasives between 20 and 80 are 24, 30, 36, 40, 46, 54, 60 and 70. The



Fig. 6—Placing Wheel for Drying

It is essential that the abrasive be untouched for several hours, so that the glue may be enabled to harden and hold the abrasive particles. This should be done in a dry, warm room. This illustration shows one way in which this drying can be arranged.

20 grade is the coarse, the 80 the fine. Finer grades such as 90, 100, 120, 150, 180 and 200 are used to prepare work for a high polish.

Once thoroughly rolled the wheel is then laid away to dry before it is used. It should be permitted to season in a warm, dry room for several hours. It is important that the face of the wheel should not come in contact with any object as there is danger of injury to the grinding face. One method of placing the wheel for drying is shown in Fig. 6.

## Electric Heaters Dry Out Motors and Conduits

In any mine where water has to be pumped or, for that matter, on the surface also, floods may occur and drown the electrical equipment, perhaps, especially in the case of pump motors, just when the need for the use of that machinery is greatest. At such time an oven is needed for drying out the coils. This oven should be of a certain easily regulated temperature, equal both night and day and in all parts of the oven. It should do its work without attendance and should be free from deleterious fumes of any kind.

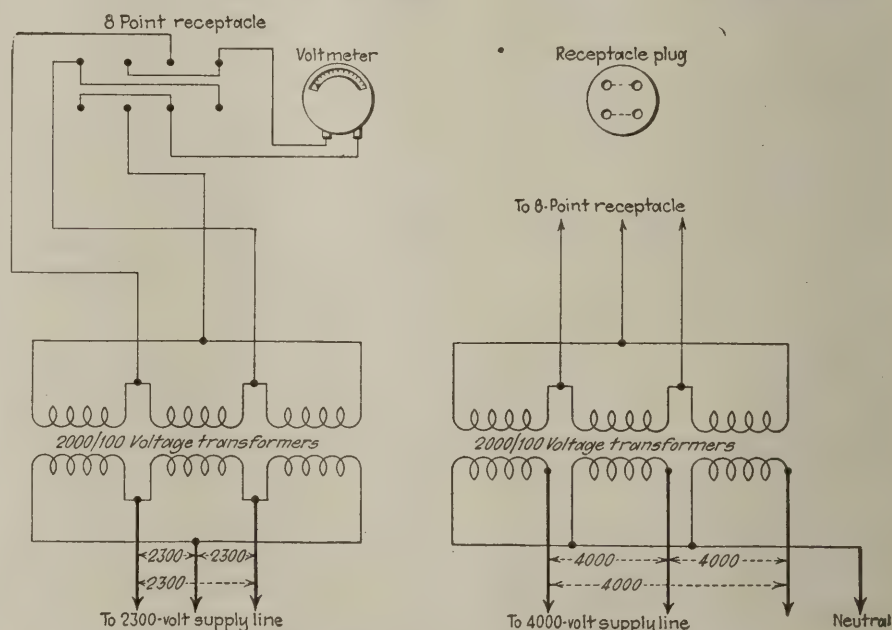
The electric oven or electric heater even without the oven is the most practical and efficacious way of drying wet electric apparatus as was well illustrated when a flood occurred above Cumberland, Md., spreading some 40 or 45 miles west of that city and flooding the streets of Piedmont, W. Va., 3 or 4 ft. deep.

As soon as the flood had subsided ways and means of drying out the water-soaked electrical apparatus were considered and a decision was made in favor of electric heat as the quickest

and most convenient way of driving out the moisture. Accordingly fifty 2½-kw. oven heaters were immediately shipped to the inundated area. When the heaters arrived, a temporary oven was built and fifteen heaters were arranged in three banks of five each and connected to a 550-volt trolley line. The owners brought their electrical equipment to this oven for treatment. The mud and *débris* were washed off with a hose, and the motors were placed in the oven to be dried. Insulation checks were made with a "megger," and when the parts were considered dry they were cleaned and sprayed with insulating varnish and returned to the factories.

In some instances, it was possible to dry the motors in place, merely by placing the heaters around the equipment and covering them. A great many conduits were dried by placing the heaters underneath the conduits and letting the warm air pass through them. Whenever the heaters could be placed close to the conduit, no wires had to be drawn and the circuits tested out perfectly after drying.

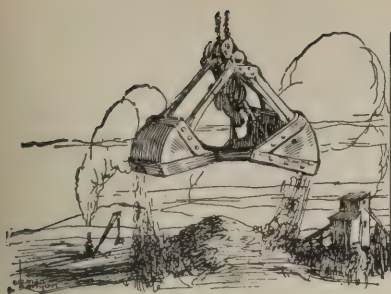
At one plant, over 300 motors, ranging from 1 to 400 hp. were under water. One hundred heaters were sent to the plant and the motors were dried out in place. In less than two weeks, the entire equipment of the plant was again in operation, and less than one per cent of the motors required rewinding or repairing. In this plant, the heaters were simply placed right up against the motors in such a way that an even drying heat could be obtained. It was unnecessary to disconnect the motors or to place them in an oven for drying. A little consideration of the conditions at the mines will enable the reader to adopt for his own use the methods put in operation after the flood just described.



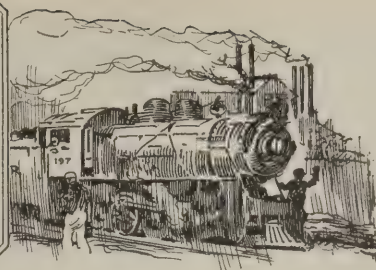
Simple Connection Diagram for Three-Phase Voltmeter Circuit

The best way to prevent delays and breakdowns is to keep a constant check on the performance of equipment. The most essential detail is proper operating voltage. Many three-phase motor circuits are provided with voltmeters, but frequently the meter is connected to but one phase. Sometimes the meter conveys the idea that the voltage is of sufficient value because it is permanently connected to a good phase. Usually the control- or power-distributing circuit is provided with three voltage transformers and it is a simple matter to connect an 8-point receptacle so that the voltage of each phase may be read independently. The diagram shows the connections which may be used for this purpose. The circuit on the left shows delta-connected 2,300-volt transformers. On the right the same type of transformers are connected wye to a 4,000-volt circuit.





# Production And the Market



## Bituminous-Coal Trade Optimistic While Waiting For Business to "Turn the Corner"

While the bituminous-coal market exhibits no haste in getting "around the corner" from the depression that has held the business in its grip for so long, a fair degree of optimism prevails, born of quiet confidence that awaited developments for the better are about to materialize. Already foreign charters for July at Baltimore are reported at a rate that augurs well for late summer and autumn export business. In most other aspects, however, there is little evidence of actual improvement, additional financial reports by coal-carrying railroads reflecting the adverse effect of the decrease in shipments of soft coal. This is especially marked in the case of the Virginian.

### Navy Department Places Contracts

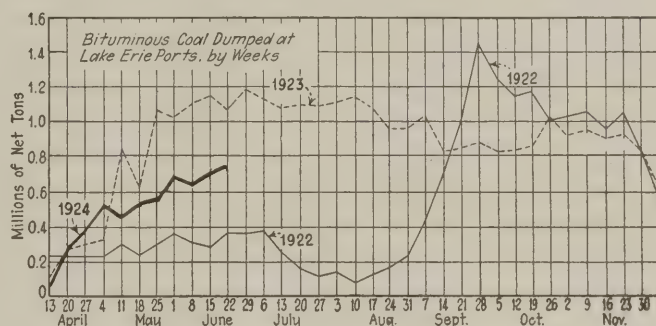
The Navy Department has awarded contracts for 110,100 tons of mine-run bituminous coal for navy yards and naval stations, on the basis of bids opened May 21. Twenty thousand tons will be delivered at New York at \$5.37 per ton under chutes, \$5.37 alongside vessels and \$6.37 delivered in the harbor and unloaded; 30,000 tons will be delivered at Boston at \$5.85 per ton; 20,000 tons at Philadelphia at \$4.90 per ton, and 35,100 tons at Annapolis at \$5.19 per ton.

As in recent weeks, *Coal Age* Index of spot prices of bituminous coal shows no variation, standing at 166 on June 30, the corresponding price being \$2.01. This is the third successive week that it has remained at that level, which would seem to bear out the theory that the bottom has about been reached.

Activity at Hampton Roads has slumped to a marked degree, dumpings of coal for all accounts during the week ended June 28 totaling 287,870 net tons, a falling off of more than 60,000 tons from the week ended June 21, when 350,821 tons was handled. Coal dumped at Lake Erie ports during the week ended June 21, according to the Ore & Coal Exchange, was as follows: Cargo,

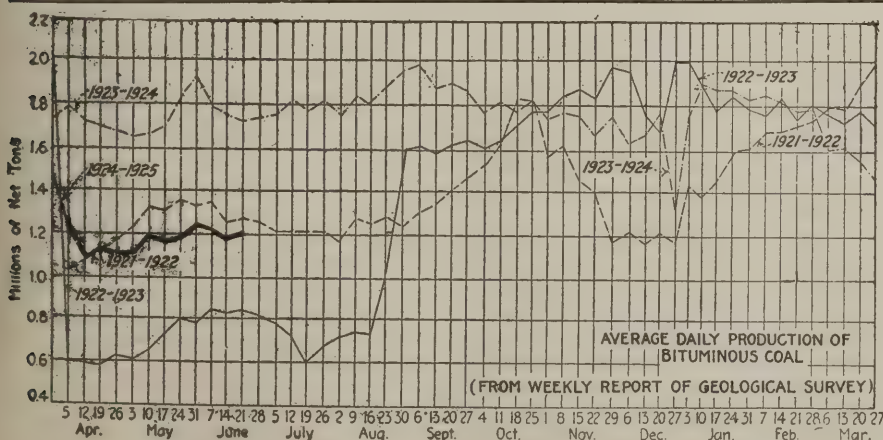
699,519 net tons; fuel 41,168 tons. The figures for the preceding week were 645,978 net tons of cargo coal and 39,184 tons of fuel coal.

Production of bituminous coal advanced slightly during the week ended June 21, but was still below that of the week ended June 7, when the more marked increase was due to a post-holiday spurt. The output for the week ended June 21, according to the Geological Survey, was 7,218,000 net tons, a gain of 66,000 tons over the revised figures for the preceding week, when 7,152,000 tons was produced. Anthracite production



was unchanged, the output for the week ended June 21 being 1,823,000 net tons, the same as for the previous week.

The slowing-down tendency in anthracite business is still in evidence, the market apparently having fallen into the throes of a summer lull that is likely to last until late-summer or early-autumn ordering sets in. Although July price advances were looked for, independent quotations show a weakening, due to the scarcity of orders. Stove continues to lead in demand, with no close competitor among the other sizes. Pea is lagging to such an extent that it is being stored. The demand for the buckwheats is fading fast.



### Estimates of Production

(Net Tons)

#### BITUMINOUS

	1923	1924
June 7	10,676,000	7,373,000
June 14 (a)	10,573,000	7,152,000
June 21 (b)	10,422,000	7,218,000
Daily average	1,737,000	1,203,000
Cal. yr. to date	260,353,000	218,861,000
Daily average to date	1,771,000	1,490,000

#### ANTHRACITE

June 7	2,046,000	1,846,000
June 14	2,053,000	1,823,000
June 21	2,042,000	1,823,000
Cal. yr. to date	49,287,000	43,707,000

#### COKE

June 14 (a)	406,000	131,000
June 21 (b)	398,000	128,000
Cal. yr. to date (c)	9,603,000	5,955,000

(a) Revised from last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.



### No Midwest Pick-Up Yet

Not a bit of improvement in the markets of the Midwest region was noted during the week. The domestic market for lump is simply non-existent. Practically all lump coal is being crushed. A very little 6 x 3-in. egg is produced for the benefit of the few dealers who are beginning to stock a little, having concluded that the price will never be lower, but day-to-day steam business is all that is worth talking about. Screenings and the smaller nut sizes are moving, although sluggishly. A little good southern Illinois screenings going to the country still brings as high as \$1.90, but that which goes into Chicago sells for \$1.75@ \$1.85. Central Illinois screenings are a little firmer at \$1.60@ \$1.75.

Western Kentucky coal continues to disturb the Midwest market for all other coals. Mine run at \$1.40@ \$1.60 and screenings for a short time ranging from \$1.25 upward set price paces that cannot be met. St. Bernard coal from mines that are trying to open on a 1917 wage basis has not yet appeared on the market. A July price of \$2 on smokeless mine run has been announced in Chicago. The market for this coal is very draggy just now. There are practically no new contracts on any kind of fuel.

A survey of the retail situation at St. Louis develops

the fact that domestic coal has not been put in this spring by the more prosperous homes for one principal reason: wet weather. People who have soft drives and whose coal is hauled across the lawn will not consider putting it in until the ground hardens up, and in this territory there has been rain every day for over two months. Practically no storage coal is being handled and coke also has dropped off. Wagonload steam is almost at a standstill and country domestic is absolutely dead. Local carload steam is quiet, although the big plants are buying a little and country steam is not a factor.

There has been no change in St. Louis prices. In anticipation of better business the next two months something like 2,000 tons of smokeless West Virginia has been ordered for July and August shipment. These orders were placed last week. Dealers report heavy supplies of all higher priced coals on hand in anticipation of some demand in July.

### Kentucky Feels Better

Business is showing just a little improvement with the Kentucky operators, and the outlook is better than it has been for some time past in spite of dullness in the iron, steel and the auto industry and a slowing down of small industries in various lines. The eastern Kentucky field, aided by low wage scales as compared with the union fields, has

### Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern	Market Quoted	July 2	June 16	June 23	June 30	Midwest	Market Quoted	July 2	June 16	June 23	June 30
		1923	1924	1924	1924†			1923	1924	1924	1924†
Smokeless lump.....	Columbus....	\$5.85	\$3.65	\$3.85	\$3.75@ \$4.00	Franklin, Ill. lump.....	Chicago.....	\$3.90	\$2.75	\$2.75	\$2.50@ \$3.00
Smokeless mine run.....	Columbus....	3.60	2.30	2.20	2.10@ 2.35	Franklin, Ill. mine run.....	Chicago.....	3.00	2.35	2.35	2.25@ 2.50
Smokeless screenings.....	Columbus....	3.35	1.25	1.30	1.10@ 1.50	Franklin, Ill. screenings....	Chicago.....	1.65	1.90	1.80	1.75@ 1.90
Smokeless lump.....	Chicago.....	6.10	3.60	3.60	3.50@ 3.75	Central, Ill. lump.....	Chicago.....	2.60	2.35	2.35	2.25@ 2.50
Smokeless mine run.....	Chicago.....	3.75	2.00	2.00	2.00	Central, Ill. mine run.....	Chicago.....	2.10	2.10	2.10	2.00@ 2.25
Smokeless lump.....	Cincinnati.....	6.25	3.75	3.85	3.75@ 4.00	Central, Ill. screenings....	Chicago.....	1.35	1.60	1.55	1.60@ 1.75
Smokeless mine run.....	Cincinnati.....	3.35	1.85	1.85	1.60@ 2.05	Ind. 4th Vein lump.....	Chicago.....	3.35	2.75	2.85	2.75@ 3.00
Smokeless screenings.....	Cincinnati.....	3.00	1.50	1.50	1.06@ 1.25	Ind. 4th Vein mine run.....	Chicago.....	2.60	2.35	2.35	2.25@ 2.50
*Smokeless mine run.....	Boston.....	5.60	4.30	4.30	4.25@ 4.40	Ind. 4th Vein screenings....	Chicago.....	1.60	1.80	1.80	1.75@ 1.90
Clearfield mine run.....	Boston.....	2.35	2.00	2.00	2.65@ 2.25	Ind. 5th Vein lump.....	Chicago.....	2.85	2.35	2.35	2.25@ 2.50
Cambria mine run.....	Boston.....	2.85	2.15	2.15	2.25@ 2.75	Ind. 5th Vein mine run.....	Chicago.....	2.10	2.10	2.10	2.00@ 2.25
Somerset mine run.....	Boston.....	2.60	2.70	2.70	1.85@ 2.50	Ind. 5th Vein screenings....	Chicago.....	1.45	1.60	1.60	1.50@ 1.75
Pool 1 (Navy Standard).....	New York.....	3.60	3.00	3.00	2.50@ 2.90	Mt. Olive lump.....	St. Louis.....	2.85	2.85	2.85	2.75@ 3.00
Pool 1 (Navy Standard).....	Philadelphia.....	3.60	3.00	3.00	2.75@ 3.25	Mt. Olive mine run.....	St. Louis.....	2.50	2.50	2.50	2.50
Pool 1 (Navy Standard).....	Baltimore.....	2.80	2.20	2.20	2.00@ 2.40	Mt. Olive screenings.....	St. Louis.....	2.00	2.00	2.00	2.00
Pool 9 (Super. Low Vol.).....	New York.....	2.80	2.20	2.20	2.00@ 2.45	Standard lump.....	St. Louis.....	2.25	2.15	2.15	2.00@ 2.35
Pool 9 (Super. Low Vol.).....	Philadelphia.....	2.80	2.20	2.20	2.00@ 2.45	Standard mine run.....	St. Louis.....	1.75	1.80	1.80	1.75@ 1.85
Pool 9 (Super. Low Vol.).....	Baltimore.....	2.60	1.85	1.85	1.80@ 1.90	Standard screenings.....	St. Louis.....	1.20	1.50	1.45	1.40@ 1.50
Pool 10 (H.Gr. Low Vol.).....	New York.....	2.45	1.85	1.85	1.75@ 2.00	West Ky. lump.....	Louisville.....	2.25	2.05	2.00	1.90@ 2.15
Pool 10 (H.Gr. Low Vol.).....	Philadelphia.....	2.20	1.85	1.85	1.60@ 2.00	West Ky. mine run.....	Louisville.....	1.75	1.50	1.55	1.50@ 1.75
Pool 10 (H.Gr. Low Vol.).....	Baltimore.....	2.25	1.65	1.65	1.50@ 1.75	West Ky. screenings.....	Louisville.....	1.15	1.50	1.55	1.15@ 1.35
Pool 11 (Low Vol.).....	New York.....	2.05	1.60	1.60	1.50@ 1.75	West Ky. lump.....	Chicago.....	2.40	2.00	1.85	1.75@ 2.00
Pool 11 (Low Vol.).....	Philadelphia.....	1.85	1.50	1.50	1.30@ 1.70	West Ky. mine run.....	Chicago.....	1.15	1.50	1.60	1.50@ 1.75
Pool 11 (Low Vol.).....	Baltimore.....	2.05	1.55	1.55	1.50@ 1.60						
<b>High-Volatile, Eastern</b>						<b>South and Southwest</b>					
Pool 54-64 (Gas and St.).....	New York.....	1.80	1.50	1.50	1.35@ 1.65	Big Seam lump.....	Birmingham.....	3.05	3.00	3.00	3.10@ 3.30
Pool 54-64 (Gas and St.).....	Philadelphia.....	1.60	1.55	1.55	1.45@ 1.70	Big Seam mine run.....	Birmingham.....	2.05	1.85	1.90	1.95@ 2.30
Pool 54-64 (Gas and St.).....	Baltimore.....	1.75	1.50	1.50	1.40@ 1.50	Big Seam (washed).....	Birmingham.....	2.35	2.00	2.00	1.95@ 2.45
Pittsburgh sc'd gas.....	Pittsburgh.....	2.80	2.40	2.40	2.30@ 2.50	S. E. Ky. lump.....	Chicago.....	3.25	2.10	2.10	2.00@ 2.25
Pittsburgh gas mine run.....	Pittsburgh.....	2.05	1.85	1.85	1.75@ 2.00	S. E. Ky. mine run.....	Chicago.....	2.35	1.50	1.60	1.25@ 2.00
Pittsburgh mine run (St.).....	Pittsburgh.....	2.25	1.65	1.65	1.70@ 2.25	S. E. Ky. lump.....	Louisville.....	3.25	2.10	2.10	2.00@ 2.25
Pittsburgh slack (Gas).....	Pittsburgh.....	1.50	1.35	1.20	1.20@ 1.25	S. E. Ky. mine run.....	Louisville.....	2.00	1.55	1.50	1.35@ 1.75
Kanawha lump.....	Columbus.....	3.00	.....	.....	.....	S. E. Ky. screenings.....	Louisville.....	1.25	1.05	.95	.80@ 1.10
Kanawha mine run.....	Columbus.....	1.85	.....	.....	.....	S. E. Ky. lump.....	Cincinnati.....	3.10	2.25	2.50	2.25@ 2.75
Kanawha screenings.....	Columbus.....	1.25	.....	.....	.....	S. E. Ky. mine run.....	Cincinnati.....	1.75	1.50	1.45	1.25@ 1.65
W. Va. lump.....	Cincinnati.....	3.50	2.25	2.25	2.00@ 2.50	S. E. Ky. screenings.....	Cincinnati.....	1.00	.85	.90	.75@ 1.10
W. Va. gas mine run.....	Cincinnati.....	1.85	1.35	1.35	1.25@ 1.60	Kansas lump.....	Kansas City.....	4.00	4.50	4.50	4.50
W. Va. steam mine run.....	Cincinnati.....	1.85	1.35	1.35	1.25@ 1.60	Kansas mine run.....	Kansas City.....	3.25	3.50	3.50	3.50
W. Va. screenings.....	Cincinnati.....	1.25	.85	.90	.75@ 1.00	Kansas screenings.....	Kansas City.....	2.60	2.50	2.50	2.50
Hooking lump.....	Columbus.....	2.75	2.45	2.45	2.25@ 2.65						
Hooking mine run.....	Columbus.....	1.85	1.70	1.70	1.60@ 1.85						
Hooking screenings.....	Columbus.....	1.25	1.35	1.35	1.30@ 1.45						
Pitts. No. 8 lump.....	Cleveland.....	2.95	2.40	2.35	2.00@ 2.75						
Pitts. No. 8 mine run.....	Cleveland.....	1.95	1.85	1.85	1.80@ 1.90						
Pitts. No. 8 screenings.....	Cleveland.....	1.25	1.15	1.10	1.05@ 1.15						

\* Gross tons, f.o.b. vessel, Hampton Roads.

† Advances over previous week shown in heavy type, declines in italics.

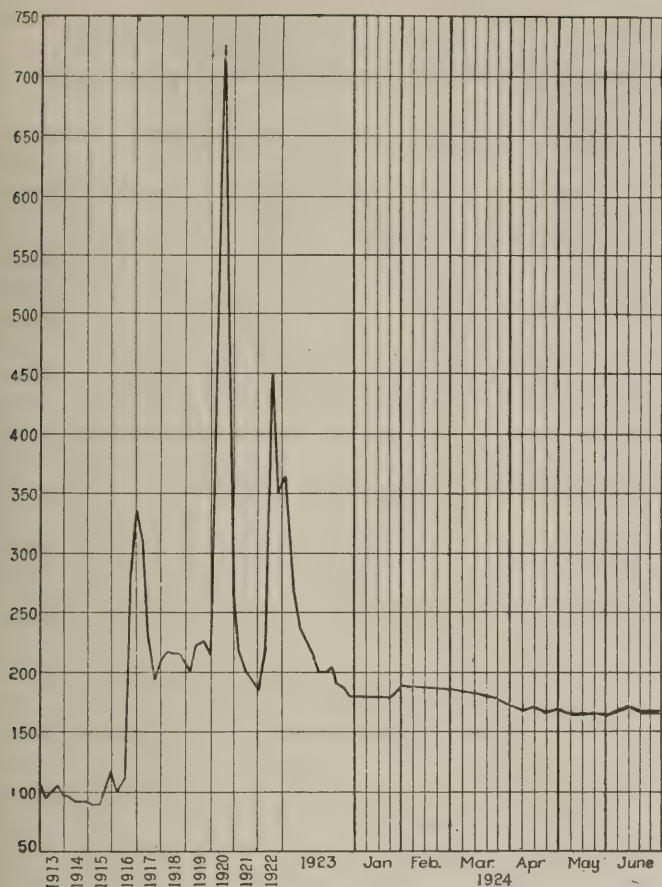
‡ On strike.

### Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

	Market Quoted	Freight Rates	July 2, 1923		June 23, 1924		June 30, 1924†	
			Independent	Company	Independent	Company	Independent	Company
Broken.....	New York.....	\$2.34	.....	\$7.75@ \$8.35	.....	\$8.00@ \$8.85	.....	\$8.00@ \$8.85
Broken.....	Philadelphia.....	2.39	.....	7.00@ 8.10	.....	8.70@ 8.85	.....	8.70@ 8.85
Egg.....	New York.....	2.34	\$8.50@ \$11.50	8.00@ 8.35	\$8.75@ \$9.25	8.45@ 8.85	\$8.75@ \$9.00	8.45@ 8.85
Egg.....	Philadelphia.....	2.39	9.25@ 10.50	8.10@ 8.35	8.80@ 9.60	8.80@ 8.85	8.80@ 9.60	8.80@ 8.85
Egg.....	Chicago.....	5.06	7.60@ 10.25	7.25@ 7.45	7.86@ 8.00	7.83@ 7.90	7.86@ 8.00	7.83@ 7.90
Stove.....	New York.....	2.34	8.50@ 11.50	8.00@ 8.35	9.00@ 9.25	8.45@ 9.10	9.00@ 9.25	8.45@ 9.10
Stove.....	Philadelphia.....	2.39	9.25@ 10.00	8.15@ 8.35	9.15@ 9.80	8.85@ 9.00	9.15@ 9.80	8.85@ 9.00
Stove.....	Chicago.....	5.06	7.60@ 10.25	7.25@ 7.45	8.17@ 8.30	8.13@ 8.23	8.17@ 8.30	8.13@ 8.23
Chestnut.....	New York.....	2.34	8.50@ 11.00	8.00@ 8.35	8.75@ 9.25	8.45@ 8.95	8.75@ 9.00	8.45@ 8.95
Chestnut.....	Philadelphia.....	2.39	9.25@ 10.50	8.15@ 8.35	8.85@ 9.70	8.80@ 8.85	8.85@ 9.70	8.80@ 8.85
Chestnut.....	Chicago.....	5.06	7.60@ 10.25	7.25@ 7.45	8.00@ 8.13	8.08@ 8.13	8.00@ 8.13	8.08@ 8.13
Range.....	New York.....	2.34	.....	8.30	.....	8.70	.....	8.70
Pea.....	New York.....	2.22	7.25@ 8.00	6.00@ 6.30	5.00@ 5.50	5.50@ 6.00	4.50@ 5.50	5.50@ 6.00
Pea.....	Philadelphia.....	2.14	7.00@ 7.35	6.15@ 6.20	5.75@ 6.25	5.75@ 6.00	5.75@ 6.25	5.75@ 6.00
Pea.....	Chicago.....	4.79	6.25@ 7.25	5.50@ 5.65	5.13@ 5.45	5.36@ 5.91	5.13@ 5.45	5.36@ 5.91
Buckwheat No. 1.....	New York.....	2.22	2.75@ 3.50	3.50@ 4.15	2.15@ 2.75	3.00@ 3.15	2.00@ 2.75	3.00@ 3.15
Buckwheat No. 1.....	Philadelphia.....	2.14	2.75@ 3.50	3.50	2.50@ 3.00	3.00	2.50@ 3.00	3.00
Rice.....	New York.....	2.22	2.00@ 2.50	2.50	1.75@ 2.15	2.25	1.50@ 2.15	2.25
Rice.....	Philadelphia.....	2.14	1.75@ 2.50	2.50	2.00@ 2.25	2.25	2.00@ 2.25	2.25
Barley.....	New York.....	2.22	1.25@ 1.50	1.50	1.15@ 1.50	1.50	1.00@ 1.50	1.50
Barley.....	Philadelphia.....	2.14	1.15@ 1.50	1.50	1.50	1.50	1.50	1.50
Birdseye.....	New York.....	2.22	.....	1.60	.....	1.60	.....	1.60

\* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.





Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

	1924			1923
	June 30	June 23	June 16	July 2
Index .....	166	166	166	203
Weighted average price .....	\$2.01	\$2.01	\$2.01	\$2.46

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board.

been able to operate 50 per cent or better. In western Kentucky the strip mines are reported to be operating six days a week in some instances, and to be loading out a lot of coal. Indications also are for larger production in that field as a result of a couple of companies having been able to resume operations on a reduction of 20 per cent in wage scales.

Retailers are meeting with a slightly better stocking demand from domestic consumers, resulting in somewhat better call for mine run and prepared sizes, while screenings, although in better supply, have been moving a shade more briskly as a result of some large consumers exhausting their storage stocks. School and institution contracting is improving. Lake movement has been slow in developing, but is coming better. Utilities and big industrial consumers have adopted a waiting policy in spite of low prices. Prices continue steady except that screenings are slightly weaker, due to larger production.

### Northwest Markets Lifeless

The Milwaukee market is lifeless, with little prospect of betterment during the summer months. Bituminous coal, especially the inferior grades, is weak and somewhat unstable in price. On the other hand, Pocahontas egg and nut have been advanced 50c. per ton. The price is now \$9.25 wholesale and \$10.75 retail. Cargo receipts since the opening of navigation aggregate 242,598 tons of anthracite and 523,420 tons of soft coal. Anthracite is short 25 per cent and bituminous about 50 per cent compared with this time last year.

Competing desperately for business and getting but little result is the present story of the coal trade in the Minne-

apolis and St. Paul territory. All concerned are mixing in a free-for-all in which no holds are barred and no rules apply. For instance, a contract for 1,200 tons of Youghiogheny lump was bid for a North Dakota town at \$4.90, a cut of \$1.10 from the list price. But even price slashing gets little business. The anticipated trade resulting from July 1 exhausting of stocks is not developing. Several of the railroads are feeling around on the subject of contracts for the coming year, but as they are covered for 60 to 90 days, they are not eager.

The dock companies are receiving fair tonnages for their Lake Superior docks, but seem not inclined to load them as heavily as a year ago, even with the promise of better related freight rates with which to meet all-rail competition. Prices on all-rail coal continues to be low. Franklin County (Illinois) lump continues to be around \$2.50, with little response to this figure.

### Parts of West Do Business

There has been no change in conditions in the Southwestern district as compared with those of a week ago. A little storage of Arkansas semi-anthracite by home owners is reflected in increased orders from retailers, there has been a slight increase in the demand for Kansas coal for threshing as the harvest starts, and the industrial demand for screenings continues sufficiently strong to prevent accumulation of "no bills." Prices are: Kansas lump, \$4.50; nut, \$4; mine run, \$3.50, and screenings, \$2.50. Arkansas semi-anthracite lump, \$5.50@6; mine run, \$3.25@3.50, screenings, \$2. Henryetta (Okla.) lump, \$5.50; nut, \$3.75; mine run, \$3.50; screenings, \$2.50.

The coal market in Colorado dragged along during the past week without much change. Dealers still remain indifferent as to summer orders, despite the fact that another advance in price was scheduled for July 1. Colorado mines averaged 21 hours last week. Forty-six per cent of working time lost was attributed to no market.

Utah mines are increasing production slightly. The working time is now fully two days a week. There are fewer "no bills," but there are still too many for the good of the industry and the railroads. Operators report lump coal to be a drug on the market, but in some cases they are finding it hard to supply the trade with smaller sizes. The slack situation is satisfactory. In spite of the efforts of organized retailers, very little coal is being stored yet.

Further gains have been recorded in the production of mines in southern West Virginia, the output of mines in the northern part of the state remaining about the same. Although some smokeless contracts have been made recently, many sales are on a spot basis and the spot market is far from brisk. So far as high volatile is concerned there has been little change in price or demand.

### Domestic Trade Stronger in Ohio

Smokeless domestic coals are stronger in the Cincinnati market because of a further limitation of production. Low-volatile operations are closing down because of the apparently hopeless situation as to slack, which had dropped to \$1 and \$1.25 this week in the best byproduct production, without any visible stimulation of demand. High-volatile coals are all off, nut and slack being weaker. Steam demand has fallen off in part at least because industrial operations have been reduced by shortage of orders. Domestic demand is better and further improvement is expected to follow the customary beginning of household buying for next winter's use in July. The state government will call for bids within a few days on 150,000 tons of coal for state institutions.

The small increase in demand for domestic sizes at Columbus continues, but steam trade is rather dull and featureless. Utilities and railroads are the best purchasers of steam grades while school coal also is moving freely. There is not as much distress coal on the market and prices are steadier. Contracting is slow as most of the consumers are buying from the open market.

Smokeless, which was fairly active several weeks ago, has relapsed into quietude. Splints and Kentucky grades are the best features of the domestic demand. Retail prices are fairly steady at the levels which have maintained for some time. Little demand has developed for Ohio-mined varieties. Lake trade is not cutting much figure as far as the southern Ohio field is concerned, but in eastern Ohio there is a considerable lake movement, which is holding up the output.



Stagnation prevails in the Cleveland market. Some of the larger operators feel that the turning point is not far distant, however, and are taking hope. Stocks can last but a short while longer. According to a monthly survey of coal consumption made by the Fuel Committee of the National Association of Purchasing Agents, coal consumption during May of this year was nearly 25 per cent less than in May, 1923.

The Pittsburgh market shows no discernible change for the week. Slack seems to be a trifle easier but can hardly be quoted any lower. There are no signs of the district being able to work in the lake trade to any extent, while the steel industry has slowed down farther and some mills will close next week for a week or more, so that demand is likely to be lighter before it is heavier.

Production in central Pennsylvania remains stationary. The scramble for orders makes it possible for some mines to do business, but others, unable to get orders, must close.

Trade at Buffalo is about as dull as it ever is at this time of the year. Some of this inactivity is due to the slowing down of business during the past few weeks, a state of things that it expected to continue until there is less politics in the air. This means till fall, no doubt.

### New England Market Drags

In New England the market drags along with little relief from the dullness that has prevailed for so long. The price of \$1.50 per net ton at the mines for slack, recently made the Panama R.R. by one of the smokeless agencies, is a fair indication of the state of trade, and while there are some who persist in being hopeful and are sure that before many weeks now the corner will have been turned, the general opinion is none too favorable. While accumulations at Hampton Roads are not as large as at times there is a plenty on hand for spot dumping. The range of price is precisely the same as a week ago, namely: \$4.25@ \$4.40 per gross ton f.o.b. vessel.

For distribution inland there is a similar lack of interest on the part of buyers. The nominal quotation at Boston still is \$5.75 per gross ton on cars, but sales are still reported at \$5.50@ \$5.60. At Portland the range is perhaps 15c. higher, but inquiry is fugitive.

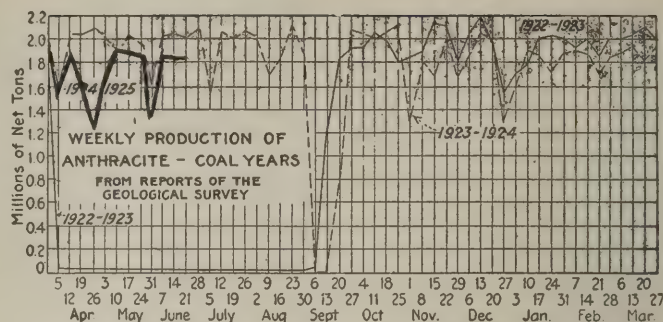
All-rail from central Pennsylvania the state of things is most discouraging. A slight indication of better prospects a week ago has given way to a rather hopeless attitude so far as concerns July business. Even small consumers who buy but a few cars each summer are postponing their purchases, being led to think the current market holds no inducement.

Trade at the New York and Philadelphia piers is extremely dull. Movement for coastwise delivery is very light and prices are depressed.

### Buying Limited in Seaboard Markets

Buying is scarce at New York, although the daily average of cars reported at the tidewater terminals remains around 1,500. Tidewater quotations have, however, not been affected to any extent although occasional purchases are reported at less than the printed quotations. Line demand is slow and easy. Things look brighter to those salesmen who travel New England territory and more inquiries are reported from buyers. In the New York market the tendency of consumers with reserve stocks to reduce them before placing new orders continues. Few if any contracts are reported as being made.

The Philadelphia market is soggy, buying being on a limited scale. Efforts to induce the iron trade to take in



excess coal, as it usually does at this time, are unavailing. Central station power plants are buying liberally. The railroads still have goodly reserves on hand. Spot prices are unchanged and tide conditions have not improved.

Industrial demand at Baltimore continues light and while there is a feeling in the air that a change for the better is about due and that business generally has been dragging bottom and will now come up on a flood tide, there is no actual indication of this as yet. The coal roads continue to report light haulage and mine representatives and jobbers say that selling has to be forced at all times. The fact that exports have shown up a bit better for the middle part of June, and that a number of charters are reported ahead for July, has heartened that end of the business.

General depression rules in the Birmingham markets, with scarcely an inquiry. Consumers are apathetic, as all branches of industry are slowing down and fuel requirements are essentially being decreased in a comparative degree. Domestic grades will be up about 20c. per ton in July over the June schedules. Several commercial mines holding old contracts with the Seaboard Air Line which were not renewed for the coming year, are closing down.

### Anthracite Market Continues to Slip

Demand for anthracite continues to slacken and quotations for independent product are a trifle lower, unless straight lots of stove coal are desired. On July 1 the larger producers, including independent operators, were expected to issue new prices showing advances from those announced on June 1 for domestic sizes, although there was some talk that the independent operators might not make any advances because of the present lack of demand. No heavy buying of domestic coals is expected until the vacation season is about ended. As during the past several weeks, stove coal is leading the demand and most dealers find it necessary to take either egg or chestnut in order to get the former. Pea coal continues to lag and storing is being resorted to. The demand for the buckwheats is rapidly disappearing.

Summer weather has put almost an entire stop to the retail trade in Philadelphia. The yards are well stocked with all sizes except stove, and even this size is coming along more freely now than at any time since spring. Stocks of chestnut coal are larger now than for years, and most of the dealers have no room for any more of it. Pea also is catching up. Egg is freer than stove. Steam sizes are very slow and even cut prices by the small producer is moving only a limited tonnage.

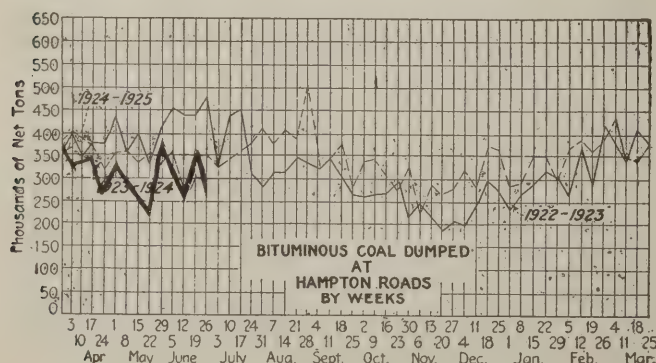
There is still uncertainty as to prices in the Baltimore market. There are some in the retail trade who would like to prevent a raise, if possible, but others feel that the retail trade has already gone too far in absorbing the wholesale advances that have taken place since May 1. Should there be wholesale advances for July it seems almost sure that a minimum raise of 25c. per ton must take place in retail prices.

### Car Loadings, Surpluses and Shortages

	Cars Loaded	
	All Cars	Coal Car
Week ended June 14, 1924.....	902,710	138,252
Previous week.....	910,707	143,353
Week ended June 14, 1923.....	1,008,838	186,955

	Surplus Cars		Car Shortage	
	All Cars	Coal Cars		
June 14, 1924.....	362,961	169,133		
Previous week.....	356,723	172,311		
June 14, 1923.....	51,988	3,129	12,787	9,257





## Foreign Market And Export News

### British Market Still Gaining Gradually; Output Hard Hit by Holidays

The Welsh coal market is improving, activity showing a gradual but steady gain. The strike of railway shopmen, now settled, has helped somewhat, though power-house operators stayed in. Business with Europe is very poor, particularly with France and Italy. Several big orders have been placed by South America for Monmouthshire large coals at prices averaging 26s. 6d. The Welsh coal field as a whole has been hampered by continual threats of sectional strikes, but tonnage is arriving much more freely. Lower qualities are reported plentiful and prices easier, while the better grades of coal are steadier. Demand is picking up but is still below output. The employment of non-union workers is threatening labor trouble.

The Ruhr settlement has resulted in the withdrawal of many German inquiries from Newcastle. The Paris gas works has contracted for 70,000 tons of ordinary Durham gas coal for shipment from July to December at 20s. f.o.b. Large contracts from the Swedish State Rys. have been allocated.

A cable to *Coal Age* states that the output of the British collieries during the week ended June 14 dropped to 3,236,000 tons owing to the observance of the Whitsuntide holidays, according to the official figures. This compares with 5,120,000 tons produced in the week ended June 7.

#### Trade at Hampton Roads Poor; Market Weakening

Business at Hampton Roads is poor, with the market weakening and movement generally falling off. Indications were June would show the lowest dumping record for the year.

Coastwise trade is less than fair, while bunker business is off and foreign movement showing little change.

The tone of the market is extremely dull, with stocks at tidewater substan-

tially increased and with shippers eager to move their stocks under any conditions to obviate demurrage.

#### New Business Is Scarce In French Market

The French coal market is unchanged. The French collieries are making regular shipments on existing contracts, but are not obtaining any new business, except perhaps for the renewal of expiring contracts. Since the settlement of the Ruhr strike deliveries are nearing their normal scale again. Recently a large number of German inquiries for coal appeared on the free market, but with the political upheaval in France, these inquiries have disappeared.

House coal trade shows the effect of the increase of British anthracites. All the coal syndicates advise their adherents to defer ordering and dealers also suggest these measures.

Indemnity deliveries to France and Luxemburg during May consisted of 243,400 tons of coal; 365,300 tons of coke and 33,900 tons of lignite briquets, a total of 342,600 tons, against 1,301,100 tons in April.

With regard to the renewal or prolongation of the Ruhr agreements, the M.I.C.U.M. heard the usual declarations of the industrialists on their inability to continue the deliveries. After receiving advices from Berlin, the mines and cokeries have accepted a prolongation of two weeks.

It is understood that the next arrangement, which is to be in operation in July, may have a retroactive effect as from June 16 as regards the abolition of the "kohlensteuer" (coal tax) on export permits and derogations and other allowances in species.

During the first ten days of June, the O.R.C.A. was supplied with 103,330 tons of coke, or a daily average of 10,333 tons.

#### United States Domestic Coal Exports During May

	(In Gross Tons)	1923	1924
Anthracite.....		445,813	274,932
Value.....		\$4,659,269	\$3,060,423
Bituminous.....		2,249,001	1,231,740
Value.....		\$12,648,775	\$5,702,818
Coke.....		165,643	40,295
Value.....		\$1,816,332	\$328,619

#### Export Clearances, Week Ended

June 28, 1924

##### FROM BALTIMORE

For Canada:	Tons
Ital. Str. Valbormide.....	5,056

##### FROM HAMPTON ROADS

For Brazil:	
Br. Str. Asuncion De Larrinaga for Rio de Janeiro.....	5,725
Br. Str. Avonmeade for Rio de Janeiro.....	5,960
Br. Str. Davenby Hall for Rio de Janeiro.....	5,678
Br. Str. Sedgpool for Rio de Janeiro.....	7,669
For Cuba:	
Br. Str. Onaway for Havana.....	5,530
For China:	
Br. Str. Romeo for Hong Kong.....	2,404
For France:	
Ital. Str. Emanuele Accame for Marseilles.....	11,353
Fr. Str. P. L. M. 25 for Marseilles.....	8,048
For Italy:	
Ital. Str. Mazzani for Porto Ferrajo.....	8,046
For Newfoundland:	
Br. Str. Hardanger for Humbermouth.....	3,461
For Nova Scotia:	
Amer. Schr. James M. W. Hall for Halifax.....	833
For Porto Rico:	
Nor. Str. Marita for Manati.....	2,192
For United States:	
Amer. Str. Hanley for San Francisco.....	3,023
For West Indies:	
Nor. Str. Thomas Haaland for Curaçao.....	4,413
For (?)	
Br. Str. Baron Glenconner for Quessant.....	4,964

##### FROM PHILADELPHIA

For Cuba:	
Nor. Str. Sydfold for Havana.....	—

#### Hampton Roads Pier Situation

N. & W. Piers, Lamberts Pt.:	June 21	June 28
Cars on hand.....	327	1,205
Tons on hand.....	22,096	76,843
Tons dumped for week.....	99,561	102,165
Tonnage waiting.....	10,000	15,000
Virginian Piers, Sewalls Pt.:		
Cars on hand.....	776	1,355
Tons on hand.....	59,400	98,200
Tons dumped for week.....	100,531	86,998
Tonnage waiting.....	12,746	2,851
C. & O. Piers, Newport News:		
Cars on hand.....	1,521	1,892
Tons on hand.....	76,735	94,665
Tons dumped for week.....	113,141	67,863
Tonnage waiting.....	7,710	2,305

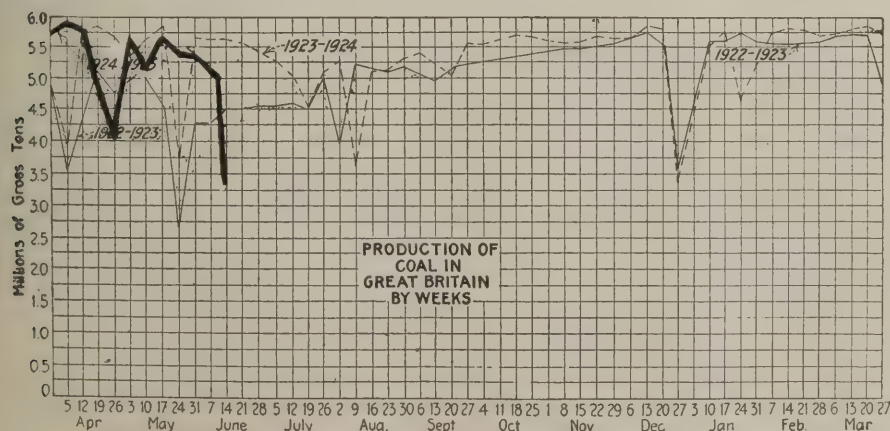
#### Pier and Bunker Prices, Gross Tons

	PIERS	
	June 21	June 28†
Pool 9, New York....	\$4.85@5.00	\$4.60@5.00
Pool 10, New York....	4.50@4.75	4.50@4.75
Pool 11, New York....	4.40@4.50	4.35@4.50
Pool 9, Philadelphia..	4.70@5.05	4.70@5.05
Pool 10, Philadelphia..	4.45@4.80	4.45@4.80
Pool 11, Philadelphia..	4.30@4.55	4.30@4.55
Pool 1, Hamp. Roads	4.35	4.35@4.40
Pool 2, Hamp. Roads	4.25	4.15@4.20
Pools 5-6-7, Hamp.Rds.	4.10@4.15	4.00@4.10
	BUNKERS	
Pool 9, New York....	5.15@5.30	4.90@5.30
Pool 10, New York....	4.80@5.05	4.80@5.05
Pool 11, New York....	4.70@4.80	4.65@4.80
Pool 9, Philadelphia..	5.00@5.40	5.00@5.40
Pool 10, Philadelphia..	4.75@5.00	4.75@5.00
Pool 11, Philadelphia..	4.50@4.80	4.50@4.80
Pool 1, Hamp. Roads	4.45	4.40
Pool 2, Hamp. Roads	4.35	4.20
Pools 5-6-7, Hamp.Rds.	4.20	4.10

#### Current Quotations British Coal f.o.b. Port, Gross Tons

	Quotations by Cable to <i>Coal Age</i>	
	June 21	June 28†
Admiralty, large..	27s. 6d. @ 28s.	28s. 3d. @ 28s. 6d.
Steam smalls.....	18s. 6d.	18s. 6d. @ 19s.
Newcastle:		
Best steams.....	21s. @ 22s.	20s. @ 21s.
Best gas.....	23s. @ 23s. 6d.	23s. @ 23s. 6d.
Best bunkers.....	20s. @ 21. 6d.	20s. @ 21s. 6d.

† Advances over previous week shown in heavy type, declines in italics.







## News Items From Field and Trade



### COLORADO

Oil prospecting on a tract of Routt County land belonging to the Colorado Fuel & Iron Co., is now going on. J. F. Welborn, president of the company, has announced that oil men repeatedly have declared there was oil under some of the company's coal lands, so finally a lease was made on a small tract on Snake River on the line between Routt County and Carbon County, Wyoming, to the Ohio Oil Co., a subsidiary of the Standard Oil Co. Thus, says Mr. Welborn, it will be determined by a reliable oil company whether there is any oil on Colorado Fuel & Iron Co. property without cost to the company.

### INDIANA

E. D. Logsdon of Indianapolis, coal operator and head of the Knox Consolidated Coal Co., the marketing agency for the mines controlled by Mr. Logsdon, has been named by Governor Emmett S. Branch as a member of the state agricultural board. Mr. Logsdon always has taken an active interest in agricultural affairs and is known as a raiser of pure bred cattle.

William J. Snyder, well known coal man of Brazil, who has become a confirmed globe trotter since the coal business slumped, has returned home after having spent the last seven months on tour of the world. He was accompanied by his grandson, Billy Hall, of Indianapolis. During the last tour the two visited New Zealand, Australia and other islands of the South Seas, then voyaging around the southern coast of Asia, through the East Indies to China, Japan and the Philippines and back home by way of Honolulu. While in China, he stopped off for a visit at Shanghai, where his wife, Grace Snyder, was killed by Korean revolutionists March 28, 1922.

The Kentucky Coal Co. was awarded the contract for coal for Delaware County, Ind., at a recent meeting of the Board of County Commissioners at Muncie, Ind. Pocahontas coal is to cost \$4.75 laid down in Muncie and West Virginia will cost \$4.62 f.o.b., Muncie.

### KANSAS

The Italian Coal Co., a co-operative organization of 24 miners, has been given a verdict against the Patton Coal & Mining Co. for \$8,050 by a jury in the Crawford County District Court at Pittsburg. The Italian company leased a mine from the Patton company, which contracted to purchase the entire output. The suit, which was

brought for \$11,150, alleged that the Patton company defaulted in payments. The Patton company claimed that the lessees used so much dynamite that a large percentage of slack was produced while the contract specified they should produce "the largest possible amount of lump."

### KENTUCKY

Judge John Stewart, of Ashland, and Judge Harmon, of Pikeville, Ky., headed a delegation of coal-mine operators of the Big Sandy Valley district, which appeared June 16 before the State Tax Commission at Frankfort in an effort to obtain lower tax assessments on coal properties. They contended that in view of stagnant conditions in the coal markets and falling values, tax assessments are in many cases far beyond the physical value of coal properties. The Edgewater Coal Co., of Pike County, objected to an increase of \$140,000 on an assessment already at \$500,000, and the Big Sandy Coal Co., now assessed at \$1,000,000, got a raise of \$300,000.

### MINNESOTA

Coal receipts by cars in St. Paul during April, just given out, show a loss as compared with April of 1923. Hard coal went from 172 to 117 and soft coal from 2,304 to 1,755.

Fuel oil burners for residential use have not proved a complete success in the Twin Cities. A number of concerns which started out to sell the devices have found that the business was not profitable, and have removed from expensive downtown showrooms to smaller ones located out from that district. Many of the smaller ones have quit completely. And the oil companies are losing interest in the fuel oil, and are getting away from it to the strictly commercial ends. Deliveries have been troublesome, access to the tanks uncertain, and many complaints encountered over deliveries. Indications are that the cost of delivering will be increased as a result of the experience of the last two winters.

### NEW YORK

J. Fred Morlock has severed his connection with the Steamship Fuel Corporation, 33 Rector St., New York City.

The report of the Lehigh Valley Coal Co. for 1923, just made public, shows net income of \$5,237,083 after bond, interest and federal taxes, against an average net of \$3,651,935 for the five years to Dec. 31, 1923. This was equal

to \$4.32 a share on the 212,160 certificates of interest offered to stockholders of the Lehigh Valley Railroad Co., compared with \$3.01 a share for the five-year period. The company's deduction for bond interest did not include provision for any interest on \$15,000,000 of 5 per cent bonds for the reason that the issue was dated Feb. 1 of this year and did not enter into the financial structure of the company during 1923. Interest on this issue for the eleven months of the current year will be a charge against this year's income.

Ralph R. McKee, president of the McKee Coal Co., New Brighton, Staten Island, has been appointed a member of the Board of Education of New York City by Mayor Hylan. Mr. McKee is a graduate of Princeton University.

The Stokes Coal Co. intends to erect a new coal distributing plant on the block fronting the Harlem River between 141st and 142nd Streets, New York City.

### OHIO

The offices of the Ohio Utilities Co. were removed July 1 to 150 East Broad Street, Columbus, according to an announcement by J. C. Martin, vice-president and general manager.

Gaylord No. 2 mine of the H. Walker Coal Mining Co., near Yorkville, resumed operations June 23 after a suspension of several months. The company is said to have obtained a contract for railroad fuel.

The sophomore miners of Case School of Applied Science, Cleveland, are taking their practice term in mine surveying at the Grant Coal Mine, Salineville, under the instruction of Anthony Jenkin, associate professor of mining engineering.

Based on sealed proposals received June 4 by the city Board of Purchase for approximately 700 tons of 2-in. screened Hocking Valley coal to be delivered in amounts specified by the chief of the Fire Department to the various engine houses of the city, the contract was awarded to the Lewis & Noon Coal Co., Columbus, on a bid of \$4.30 a ton.

Cincinnati wholesalers and operators in southeastern Kentucky are keeping a close eye on the deal by which the Louisville & Nashville hopes to gain complete control of the C. C. & O. Ry. Already large terminals are being placed at Whitesburg, Ky., and work is proceeding that will allow the Hazard people an outlet to the seaboard. With



this, they say, an entirely new era for southeastern Kentucky coals can be looked for.

The branch office of the Three States Coal Co. in the Frederick H. Schmid Building, in Cincinnati, will be closed as of July 1 and Frank Beazley, who has been in charge for nearly two years, will return to Bluefield, W. Va., the head office, where the business of the company will be transacted, according to advices that have been given to associates in the trade at the Queen City.

H. M. Harvey, president of the Harvey Coal Co., of Knoxville, has been in Cincinnati for several days past, called by reason of the hearing of the suit of his company for the return of its mining property in the Hazard district from Jewett, Bigelow & Brooks in the United States District Court at Covington, Ky. The mines were purchased on the ten-year payment plan and it is charged that the J. B. B. company defaulted on payments over a year ago.

## PENNSYLVANIA

Fire, June 24, destroyed the tippie and equipment of the Yukon Coal Co., at Yukon, near Greensburg, Pa., entailing a loss of \$30,000. Rebuilding plans will be announced in about two weeks.

The Newborn mine, near Carrolltown, Cambria County, was put into operation last week after a lengthy shutdown. John Kelly, Carrolltown operator, is superintendent of the mine. Most of the miners are residents of Carrolltown and welcome the return to work.

State Mine Inspector C. H. Nesbitt has just completed his statistics on coal-mining operations for 1923 and turned them over to the printer for publication in pamphlet form. Coal production reached the record figure of 20,919,303 net tons, with a coke production of 4,689,641 tons, almost the entire coke tonnage—94.8 per cent—having been turned out by byproduct ovens.

The St. Clair Coal Co. is about to erect a new steel breaker adjacent to

its present breaker at St. Clair. The new plant will be equipped with three cone separators having a capacity to prepare about 1,400 tons of coal per day. The structure and equipment will be designed by H. M. Chance & Co., of Philadelphia, a license contract having been signed covering the use of the Chance sand flotation process at the plant.

E. S. Sheets, who a year ago purchased Ira Barron's coal interests south of Somerset, which includes a vein of cannel coal, has disposed of his holdings to the Superior Coal Co., formed by Attorney Ross E. Scott and James Davis, of Somerset. Mr. Davis is owner of an adjoining mine, and the entire acreage will be mined through the opening on the Davis property. The consideration was \$15,000. Mr. Sheets will move to Windber.

Workers taking matches, pipes or cigarettes to the mines of the Glen Alden Coal Co. at the Loomis colliery, Hanover Township, will be discharged, it was announced in the local press following the recent disaster at the colliery. This order at the Loomis, as well as other Glen Alden operations, is not a new one, company officials stated. It had been in effect long before the fatal explosion occurred several weeks ago.

Twenty-two candidates were successful in the nomination for first-grade mine foremen, 72 for second-grade certificates, 21 for first-grade assistant mine foremen and 41 for firebosses, according to an announcement by Mine Inspector Nicholas Evans, head of the board of examiners for the nine districts in the central Pennsylvania field. The examinations were conducted in Johnstown on May 27, 28 and 29. Additional examinations will be held at State College and in Pittsburgh on July 16, 17 and 18.

"When a Man's a Miner," a moving picture shown at the last meeting of the Pennsylvania Mining Institute held in Johnstown, showed conditions of a modern mine at Tiptonville, Ohio. A number of interesting scenes were shown, including a fall of roof which imprisoned miners for several days. "High and Low Voltage" was discussed

by Patrick Nairn, William Duncan and John Gelatly, of the Ohio Brass Co., of Pittsburgh. Papers on "Mine Cars" and "Mechanical Coal Loaders" were read by representatives of manufacturers. Talks on safety were given by Dean Holbrook and William Duncan, of State College. No more meetings will be held until Oct. 17.

The Bertha-Consumers Co., Pittsburgh, has issued \$2,000,000 first mortgage 7 per cent sinking-fund gold bonds dated June 1, 1924, and due June 1, 1934. The company has a capital of \$4,150,877 in 7 per cent cumulative preferred stock and \$4,908,458 in common stock and owns mineral rights underlying 4,443 acres of developed coal lands and leaseholds of additional mineral rights underlying 422 acres of developed coal lands in Allegheny and Washington counties, Pennsylvania, and Brooke, Monongalia, Marion and Kanawha counties, West Virginia. The total coal recoverable from these properties is estimated at 27,753,900 tons.

Of the 157 fatal accidents in the industries of the state in May, according to the Bureau of Workmen's Compensation of the Department of Labor and Industry, sixty-two occurred in the anthracite and bituminous mines. Forty-three fatalities occurred in the anthracite region and nineteen in the bituminous field. The largest number of mine fatalities in the anthracite district during May was recorded from Luzerne, which had eighteen deaths in the mines and only two in all other industries. In the bituminous counties Allegheny and Fayette led with four mine fatalities, each, Allegheny reporting eighteen other deaths due to industrial accidents and Fayette two deaths not attributed to the mining industry.

Two new all-steel towboats of modern design, built for coal and steel trade, will begin service in Pittsburgh waters during July. One is the steamer Donora of the American Steel & Wire Co., and the other is the steamer Sailor, of the Jones & Laughlin Steel Corporation. The Donora is being completed at the Howard Shipyards Co., Jeffersonville, Ind., on the Ohio River, and will be delivered early this month. The



Some Indian Mines Still Hoist Coal This Way

The photograph, from the Geological Survey of India, shows a winding gin near Charanpur, in the Raniganj coal field. Women in the merciful shade of the thatched roof, wind a 500-lb. load in a bucket up through the shaft. From the bucket it is usually loaded in a coal tub on a four-wheel truck and moved to a storage pile awaiting shipment.



Sailor is nearing completion in the yards of the Marietta Manufacturing Co., Point Pleasant, W. Va., also on the Ohio River. It is now almost ready for delivery. Both towboats contain the latest innovations in design and equipment for heavy duty in handling big tows of steel and coal on the Monongahela, Ohio and Mississippi rivers.

## UTAH

The acquisition of one-half of the stock of the Denver & Rio Grande Western R.R. by the Missouri Pacific carries with it the transfer of one-half of the stock of the Utah Fuel Co. It is not expected, however, that this will involve any changes in the operation of the big coal company.

Coal production in Utah during May was 260,586 tons, compared with 311,955 tons for the same month last year.

## WASHINGTON

Bunkering of steamships is increasing in Puget Sound. On June 14 the Danish steamship Transvaal and the Garland line steamer Carolinian, both cargoes with lumber for long voyages, coaled simultaneously at the Pacific Coast Coal Co.'s bunkers in Seattle—the only bunkers on the coast large enough to coal two such ships at once.

Hereafter the Indian Mine of the Pacific Coast Coal Co. will be known as the New Black Diamond, according to an announcement recently made by officials of the company. It is still in the development stage. The intention of the company, however, is to tap the famous McKay seam, which has been worked for many years at Black Diamond, a few miles further east, and preliminary surveys have indicated that this objective will be attained. The new mine is intended ultimately to supplant the Black Diamond mine, which is now the deepest coal mine on the American continent and nearing the end of profitable productivity. It is expected that New Black Diamond will be brought into full operation within the next few years. Several hundred thousand dollars is being spent by the Pacific Coast Coal Co. in developing the mine.

## WASHINGTON, D. C.

Appropriations by Congress of \$1,900,468 will be available for the Bureau of Mines for the fiscal year beginning July 1. They include investigation of mine explosions, \$359,768; mine inspection, \$35,000; mine rescue and safety, \$262,300; purchase of mine rescue car, \$40,000; mineral fuel investigation, \$138,280; ore studies, \$128,360; oil and oil-shale investigations, \$500,000; administration of leasing law, \$91,360; mining experiment stations, \$200,000; Pittsburgh station, \$57,400; and maintenance of government fuel yards, the expenses to be paid out of the receipts. The Geological Survey is given \$1,706,482. These funds include topographic surveys, \$500,000; geologic surveys, \$333,722;

investigation of mineral resources of Alaska, \$75,000; examination and classification of lands, \$280,000. The General Land Office is given \$700,000 for surveying public lands, including inspection of mineral deposits and coal fields.

## WEST VIRGINIA

A station is to be opened in Huntington on July 1 by the U. S. Bureau of Mines. W. H. Forbes will be in charge of the office, which will be located in the federal building. Mr. Forbes will direct the mine safety service work in southern West Virginia. "Although the bureau has had a mine safety car in the state doing mine safety work since 1910, it has just been decided to open engineer's headquarters here to keep in closer touch with mining men," declares Mr. Forbes. He stated that he would be glad to take care of all requests from mining men for the examination of mines and report as to their condition. Huntington will be headquarters also for the mine car, which is equipped with all safety devices pertaining to mining.

The Hisylvania Coal Co., chartered under the laws of the State of Ohio, of which E. W. Blower of 8 East Broad Street, Columbus, Ohio, is secretary, has been authorized to transact business in West Virginia.

The following West Virginia coal concerns have increased their capital stock in the amounts given: Coe Pocahontas Coal Co., from \$200,000 to \$300,000; The Kalbaugh Coal Co., Inc., from \$25,000 to \$50,000; Buffalo Eagle Colliery Co., from \$500,000 to \$800,000; Glade Creek Coal & Lumber Co., from \$2,000,000 to \$2,150,000. The Fat Creek Coal Corporation has reduced its capital stock from \$100,000 to \$35,000; the Kanawha Valley Coal Co. has changed its capitalization of \$2,000,000 to 100,000 shares of common stock at \$10 and 10,000 shares of preferred stock at \$100,000.

The Pocahontas Fuel Co. has decided to close down the Itmann mines, in the Wyoming County field, for an indefinite period. This makes fourteen plants in the Winding Gulf district now in idleness because of lack of sufficient business to justify operation. Loading at other mines in the same district, however, is being increased and operators are inclined to believe that by mid-July it will be possible to operate plants on an average of from four to five days a week.

## CANADA

The Dominion Coal Co. is opening a new mine, to be known as No. 1B, on the sea coast near the town of Dominion, N. S. The new shaft is equipped to produce coal for 100 years. A tunnel 10 ft. high has been cut in solid rock above the seam, and electric haulage locomotives will be used.

It is reported that the coal miners of Fernie, B. C., are considering a settlement of the strike now on through-

out District No. 18, United Mine Workers, which includes eastern British Columbia and the Province of Alberta, insofar as it affects the collieries of the Crow's Nest Pass Coal Co. The signing of a local agreement with the company was discussed at a special meeting and officials of the union have been called to the district to avert such action.

Coal production in British Columbia for the month of May totaled 114,752 tons. This compares with the average of 200,000 tons, showing the result of short working time. In the Crow's Nest Pass there is no output because of the strike. Although there is peace between the employers and employees in the Nicola-Princeton and Vancouver Island fields the demand is so weak that the collieries are unable to maintain operations at anything like capacity.

## New Companies

**The British Canadian Coal Co., Ltd.**, has been incorporated with a capitalization of \$500,000 and head office in Montreal by Harold Fisher, Livius P. Sherwood and Stanley M. Clark.

**The Valentine Coal Co.** has been incorporated with a capital stock of \$60,000 in Worland, Mo., by H. L. Rogers, A. A. Grimmel and others. Mr. Rogers is president of the company.

**The Missouri-Oklahoma Fuel Co.** has been incorporated in Muskogee, Okla., with a capital stock of \$700,000, by Wm. McKinnon, of Kanima, Okla.; E. D. Holley, Stigler, Okla., and others.

**The Tennessee Coal Mining & Timber Co.** has been incorporated in Chattanooga, Tenn., with a capital of \$500,000, and is reported to have purchased over 20,000 acres of coal and timber land near Coal-mont, Tenn.

**The Oliver Fuel Co.**, a Philadelphia concern, has been chartered under the laws of the State of West Virginia, with a capital stock of \$50,000. Those principally interested in the company are J. A. Bal-lenger, of Mullite, N. J.; C. P. Hagenlocher, F. D. Jones, W. Kaufman and William LaBelle, all of Philadelphia.

## Industrial Notes

**The Denver Rock Drill Manufacturing Co.**, of Denver, Colo., recently opened a Chicago branch office at 817-825 West Washington Blvd., with A. J. Philpott as manager.

**Rome Wire Co.** announces the opening of a sales office with a complete warehouse stock of its products at Ninth Street Terminal Warehouse, 1200 West Ninth Street, Cleveland, Ohio. C. R. Evans, district manager, will be in charge.

To better serve their customers in the Southwest, the **Chicago Pneumatic Tool Co.** has opened a branch office at 210 So. Jefferson Street, Dallas, Texas, with J. O. Bailey in charge, reporting to the New Orleans branch.

**Herman Lemp**, engineer in charge of the internal combustion engine engineering department of the General Electric Co., at Erie, has resigned his connection with that concern to join the Erie Steam Shovel Co. This follows an association with the General Electric Co. for 42 years.

**The Nanticoke Valley Coal Co.**, of Wilkes-Barre, Pa., has just executed a license agreement with H. O. Staples for the use of the Chance sand flotation method at a washery to be located on the property of the Susquehanna Collieries Co. near Nanticoke, Pa., at what is known as the Nanticoke No. 7 bank. The plant will be equipped with a 15-ft. cone separator.



## Traffic News

### South Dakota Would Retain Low Rates on Lignite

The Board of Railroad Commissioners of South Dakota has made a strong plea to the Interstate Commerce Commission in the interest of the continuance of lower rates on lignite than that charged for high-grade bituminous coal. If proposed increases are allowed to go into effect, the use of South Dakota lignite will be restricted to the localities immediately surrounding the mines, it is asserted. The board contends that it is of great economic importance to the Northwest to make use of this low-grade fuel. It is stated that the present lignite rates yield a reasonable revenue and that lignite is entitled to a classification different and lower than coal.

### To Hold Hearing on Proposal to Advance Rates in Ohio

The Coal, Coke and Iron Ore Committee, Central Freight Association Territory, will hold a hearing in Room 606, Chamber of Commerce Building, Pittsburgh, Pa., Thursday, July 17, 1924, at 10 a.m., daylight saving time, on a proposal to increase the rate on bituminous coal, carloads, from mines on the Baltimore & Ohio, New York Central (Ohio Central Lines), Pennsylvania and Wheeling & Lake Erie roads, in the Shawnee, Hocking and Crooksville (Ohio) districts, to local stations on the Baltimore & Ohio R.R., Lexington, Ohio, to Fredericktown, Ohio, inclusive. The advance proposed, from \$1.39 per net ton to \$1.51 per net ton, is to restore these rates to the Mansfield (Ohio) basis, which was the basis in effect prior to Aug. 15, 1919, and which basis or higher is now in effect from other Ohio districts, including short-haul rates.

### Delivery of Pennsylvania's New Cars to Begin Soon

Delivery on the 12,000 freight cars ordered soon after the first of the year by the Pennsylvania R.R. will start this month. The Pennsylvania is preparing to accept between 125 and 150 cars a week during the first few weeks of delivery, with a gradual increase in the number until practically all of the cars will be on line for the movement of the autumn traffic.

### Mistrial in Demurrage Suit

Trial of the test case of the Smokeless Fuel Co. against the Chesapeake & Ohio Ry. to establish a basis for deciding the old war-time demurrage suits, in which practically all coal agencies at Norfolk port are endeavoring to collect approximately \$250,000 from the railway for alleged overcharge for demurrage, was halted in Newport News last week when it was found that a member of the jury was an employee of the railroad. A mistrial was ordered after the case had proceeded for three days, and it has been set for retrial in July.

### Virginian Moves Big Coal Train

The Virginian Ry. on June 9 hauled out of Princeton, bound for Roanoke, a 10,200-ton coal train, using a 700 U. S. Mallet type engine, which is said to be a record with this type of engine. The train consisted of 65 120-ton coal cars. In May, 1921, the Virginian operated a demonstration train out of Princeton consisting of 100 loaded 120-ton cars, but the train was drawn by the big 800 type engine.

## Obituary

Edgar M. Reynolds, vice-president and comptroller of the Lehigh Coal & Navigation Co., of which he had been an officer for more than 20 years, died at his home in Germantown, Philadelphia, June 16, after an illness of four weeks. He was born in Newark, N. J., in 1861, and had 19 years' experience in the railroad field before joining the L. C. & N. At the time of his death he also was an officer and director of several companies affiliated with the L. C. & N.

## Trade Literature

**Webster from the Air.** Warren, Webster & Co., Camden, N. J. Pp. 30; 6x9 in.; illustrated. Contains aerial photographs of cities where the Webster steam-heating system has been installed.

**The Century Wood Preserving Co.,** Pittsburgh, Pa., has issued a four-page folder describing the advantages, effectiveness, construction, capacity and reliability of the **Shipley Treating Unit** for timber preservation.

**Wire Rope.** Macwhythe Co., Kenosha, Wis. Pp. 80, 5½ x 7½ in.; illustrated. Describes uses and kinds of wire rope and fittings, being designed to answer all questions pertaining to wire rope in as few words as possible.

**Tempo Shower Washing Equipment for Mine, Mill and Factory.** James H. Channon Mfg. Co., 223 West Erie St., Chicago, Ill. This 6-page folder describes and illustrates showers, wash-sink faucet and water tempering system.

**High and Dry.** James H. Channon Mfg. Co., 223 West Erie St., Chicago, Ill. Pp. 17; 6x9 in.; illustrated. Describes the Union sanitary clothes hanger suspended by chain and pulley from the top of the room, with a basket arranged to hang above the clothes for lunch and valuables. Price list is appended.

**Storage Battery Locomotives.** Mancha Storage Battery Locomotive Co., St. Louis, Mo. Pp. 10; 9x10½ in.; illustrated. Among the locomotives described is the **Little Tramper** which will run onto a small mine cage and go to any level like a mine car.

## Coming Meetings

**World Power Conference,** Wembley, London, England, June 30-July 12. O. C. Merrill, Federal Power Commission, Washington, D. C.

**First International Management Congress,** Prague, Czechoslovakia, July 21-24.

**Rocky Mountain Coal Mining Institute.** Summer meeting, Aug. 7-9, Rock Springs, Wyo. Secretary, Benedict Shubart, 521 Boston Bldg., Denver, Colo.

**New York State Coal Merchants Association, Inc.,** 14th annual convention, Sept. 4-6, Stamford-in-the-Catskills, N. Y.; headquarters Churchill Hall. Executive secretary, G. W. F. Woodside, Arkay Building, Albany, N. Y.

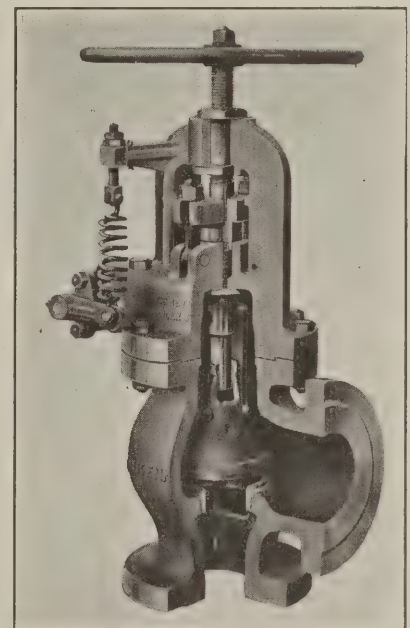
## New Equipment

### New Non-Return Valve

The Lunkenheimer Co., of Cincinnati, Ohio, has recently placed on the market the safety non-return valve, intended to be placed on the outlets or nozzles of steam boilers, shown in the accompanying illustration. This device is intended to supplant the ordinary check valve often used on boilers to prevent a flow of steam from the header, or from another boiler back into a unit not in use. As may be seen from the illustration, which shows a section through the device, it consists of what practically amounts to a globe valve with a spring-counterbalanced disk. As may be noted, the spring as well as its adjusting mechanism is external to the valve proper.

The stem of this valve is not connected to the disk, but the disk slides upon it when the stem is raised. Counterbalancing the disk by means of the external spring obviates all chattering of the valve against its seat. When the boiler upon which one of these valves is installed generates sufficient steam pressure to lift the disk from its seat, it is automatically cut into the line. However, should a tube burst or a header in the boiler be ruptured, causing a backflow of steam from the header to the boiler, the valve immediately closes and prevents steam from other boilers reaching the one which is injured.

This valve forms a highly effective safety device in case a boiler is being cleaned. Even if the stem is raised through accident or otherwise, the valve closes the instant pressure from



Half Section of Valve

The counterbalanced seat slides on the valve stem. The valve may be closed by operation of the handwheel but it can be opened only by pressure from below the disk.



the outside is applied and will not permit a back flow of steam into the boiler being cleaned or inspected. In the past, many distressing accidents have resulted from such causes as have just been outlined.

### Gyrating Coal Shaker

Those familiar with present practice followed in anthracite preparation well know the great overall length of shaking screens. Such shakers occupy much space in the expensive structure of the breaker in which they are employed. Could this length be materially decreased it would result in economies out of direct proportion to the actual decrease in overall dimensions.

In order to accomplish this result H. W. Falker, of Ashland, Pa., has developed what has been named the Master screen shown in Fig. 1. This is a development of, or an improvement on the Economy gyrating screen developed by Mr. Falker some years ago. In the original screen the eccentrics driving the screen decks revolved in opposite directions affording elliptical paths of different amplitude to each point on a screen deck, as may be seen in Fig. 2. In order to obviate this difficulty and the unequal wear of the screen which it entailed, in the new device the eccentrics revolve in the same direction. This gives every point on the screen a circular motion equal in diameter to twice the throw of the eccentrics.

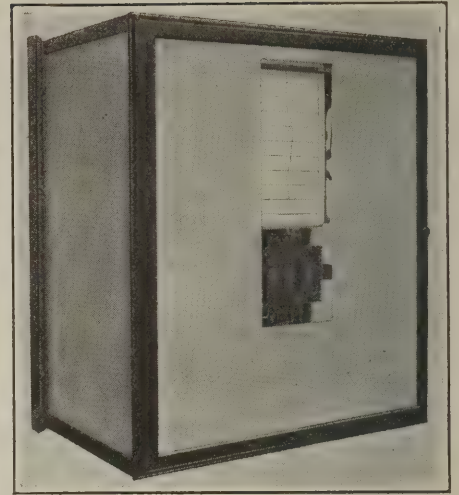
Advantages claimed for this machine include the following: All portions of the screen plate are used to maximum advantage and there is small tendency for the holes to wear elliptical. As all points on this screen describe circular

instead of rectangular paths as in the case with the ordinary screen, the effectiveness of the two should be to each other as the circumference of a circle is to its diameter, or as  $\pi : 1$ . Thus the same screening effect should be secured with less than one third the screen area. The floor space occupied by a screen of this kind as compared to that necessary for the ordinary shaker will be even less proportionately, as no long eccentric rods are necessary.

### Totalizing Polyphase Wattmeter

A recent General Electric Co. development is a totalizing recording wattmeter. This instrument is direct acting and operates on the induction principle. The moving element consists of a shaft approximately 36 in. in length on which are mounted four metallic disks. Grouped around these disks are split-phase torque producing elements, sixteen in number, thus making it possible to totalize any number of polyphase circuits from two to eight. A strip chart, 6 in. in width, is employed, and the record is made by a siphon type pen connected to the moving element through a simple link. The high torque of this instrument makes it available for operating remote indicators.

A complete line of remote indicators for use in conjunction with these instruments is now available. These indicators are of various styles and sizes but are all operated by Selsyn motors, actuated by a Selsyn transmitter geared to the shaft of the wattmeter instrument. This Selsyn system consists of a transmitter and



Wattmeter for Totalizing Power

This instrument is composed of many metering elements so connected that it is possible to totalize the consumption of power in from two to eight polyphase circuits.

motor so connected electrically that rotation of the transmitter causes a similar rotation of the motor. Manually operated transmitters and indicators are supplied as well as combinations of both manual and automatic indicators.

### Steel Transmission Pole

The Truscon Steel Co., of Youngstown, Ohio, has recently placed on the market the new steel transmission pole shown in the accompanying illustration. Poles of this kind may be manufactured in all sizes up to 50 ft. in length. One salient feature of this new steel pole is its simplicity of construction, being pressed from 5 in. to 12 in. steel channels or I-beams. The design is such that no special equipment is needed by the lineman for ascending or descending, thus eliminating all necessity for climbing spurs or steel steps.

This pole is adaptable not only to transmission and distribution lines, but to telephone, trolley and street lighting systems. It is made by pressing a portion of the web of a channel or I-beam out to a predetermined angle and then riveting this section to another of a second channel or I-beam. Before this pole was placed on the market in quantity, it was subjected to practical tests under varying conditions for a period of two years. It is claimed by the manufacturer that when this pole is anchored in concrete and painted once every five years, it will last indefinitely. It is also maintained that because of the ease of its manufacture, it will ordinarily cost about the same as a wood pole. In some sections of the country its cost may be less.



Fig. 1—Side and End Views of Gyrating Screen

Two vertical eccentric shafts revolve in the same direction, thus imparting a rotary motion to the screen decks. A screen with any even number of decks may be balanced so that vibration is neutralized.

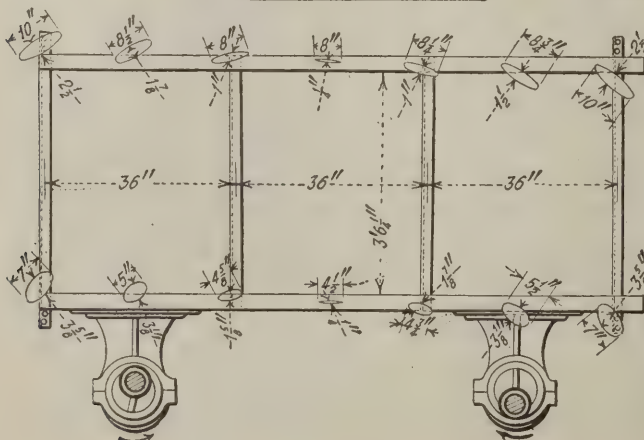
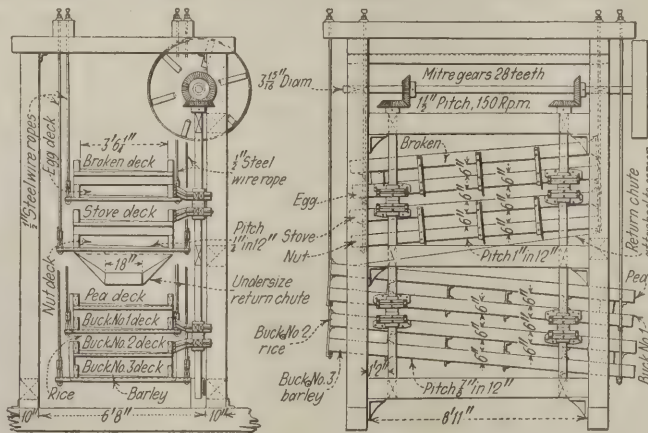


Fig. 2—Unequal Travel Imparted by Opposite Eccentrics

Revolving the two vertical shafts in opposite directions impart an unequal travel to all parts of the screen, each point upon it moving in a more or less elongated ellipse. This results in unequal wear of the screen plate.



# COAL AGE

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Devoted to the Operating, Technical and Business  
Problems of the Coal-Mining Industry

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## Every Man Has His Own Gas Plant

EVERY house furnace gasifies its own fuel and burns the gas for heating. Isolated units of such small dimensions would seem utterly uneconomical. They may pass eventually into the discard, but just at present the household furnace seems firmly established with all its inefficient combustion and its high costs of attendance. Surely the gas men must find a better way before long, but until they reduce the price of gas the present antiquated system will continue. The gas men certainly should explain why they have been making so little of their large opportunities.

## Everybody Happy

PARTIES having opposing interests rarely succeed in writing consistent platforms. The recent Democratic program has this character of inconsistency. To please certain Western delegates the following plank was written: "Mining is one of the basic industries of this country. We produce more coal, iron, copper and silver than any other country. The value of our mineral production is second only to agriculture. Mining has suffered like agriculture and from the same causes. It is the duty of our government to foster this industry and to remove the restrictions that destroy its prosperity." This plank will be a good one to appease the demands of the mining region, especially in the West.

The coal men do not ask to be fostered, not at least in the year of grace 1924. Not since the war has the coal man had the notion that he wanted governmental coddling. Before the war the coal industry in Illinois believed it might be possible to obtain a modification of the Sherman Act to allow the forming of a combination that would permit the fixing of a fair price. The Illinois operators believed that they might, and should be, allowed to follow the example of Germany under government supervision. Soon after, they found the market favored highly profitable operation and changed their minds. When their balance sheet showed black figures they became opposed to any government control and so no longer advocated any change in the law.

The plank just recited seems to them suprisingly equitable and more than they could have hoped to attain, but its strength is sapped by what follows: "We pledge the Democratic party to regulate by governmental agencies the anthracite coal industry and all other corporations (sic) controlling the necessities of life, where public welfare has been subordinated to private interests." That will please the consumer states, especially New England. So the platform in places suits both consumers and producers, all according to the particular plank quoted.

It is ill written because opponents in consumer states can quote the anti-consumer plank and in producing states can quote the anti-producer plank. Consequently the program is acceptable to everybody—to Republicans

because it can be quoted against the Democrats, and to Democrats because the plank can be quoted to Democratic audiences as the audience addressed would prefer. The mining planks, therefore, are masterpieces; everyone will find in them just what he wants to prove his case.

## Knowing Versus Guessing

NOTHING is safer than knowing, yet how few are the companies who really know just what they are doing. Nevertheless, more is known today than even a few years back. Most of them know the labor cost of mining, deadwork, ventilation, trackwork, drainage and so forth, but almost none know the actual power costs of these various items and few the supply costs. They cannot compare the power and supply costs between mine and mine, nor tell how they vary from month to month. Having no means of comparison they do not know which are high and which low and cannot tell what they should do to keep the costs down.

If, however, it is well to know labor costs; if knowing the costs has reduced them, surely it would be advantageous to learn the power and supply costs in order that similar efforts may be expended in their reduction. It would be well to meter the various power uses, to know how the power, supply and repair costs of locomotives, machines and fans vary so that economy may be sought in each and rules be formulated that will reduce them all to an irreducible minimum. When we can set a mark at which to aim, we can come nearer the goal. Of course, costs will vary with grades and distances in the case of locomotives, with the kind of coal cut in the case of machines and with the resistance and air delivered in the case of fans, but by a comparison of month with month and operative with operative much will be learned and costs will be reduced. Between knowing and guessing, who will not choose the former?

## Have a Heart

TOO OFTEN the wiring diagrams furnished with electrical equipment, especially for automatic apparatus, are too complicated for even a professional puzzle expert to unravel. The Behistun rock has no more perplexing symbols.

To the designing engineer who is forever dealing with complicated connection diagrams a statement like this probably sounds foolish. Perhaps he would be inclined to be even a bit critical and say that the man who couldn't follow his diagram was not much of an engineer.

But almost every electrical manufacturer uses signs and symbols peculiar to his own drafting department, and the mine electrical engineer, who of necessity must purchase equipment made by many different companies, must learn the particular style of each.

It is not unusual to find the electrical equipment used



in any modern substation or power plant made by six or seven different manufacturers. Often this means that six or seven wiring diagrams must be understood and then changed into one which shows the whole wiring layout of the plant.

Would it not be advantageous for the manufacturer to simplify these diagrams, standardize them a little more, so that the mine engineer would not be scared away from buying new forms of equipment which would suit his requirements much better than the old types with which he is more familiar? Manufacturers must not forget that the equipment must be maintained by the men at the mines who, rather than admit they do not understand certain wiring diagrams, very heartily condemn apparatus which is accompanied by a complicated connection blueprint.

Manufacturers should never overlook that progress in industry always has been delayed by the fear of the purchaser or his agent that he will not be able to handle the equipment satisfactorily. Consequently it pays to depict the connections so that they will be understood, and to design the machine so that a minimum of information and brain power will serve to operate it.

### As It Is Done Abroad

**A** REPORT on the Causes of and Circumstances Attending the Inrush of Water Which Occurred at the Redding Colliery, Falkirk, Stirlingshire, on the Twenty-fifth of September, 1923," by Sir Thomas H. Mottram, Chief Inspector of Mines, and presented to Parliament by command of His Majesty, appears on the editorial desk. This little book is headed by the royal arms with the lion and the unicorn as supporters. It has thirty pages of text and five large folding plates.

Only forty men were killed at the Redding Colliery by that inrush of water. We have been wondering how many volumes of text would be written and possibly should be written here about our mine disasters, often larger and always more numerous than those in Great Britain, if we gave printing space to the subject equal to that which is devoted to it there.

But we let the press carry the story. We shudder, pass on and forget. Perhaps if we took the matter more seriously it would be possible to reduce the number of accidents. Our state reports in earlier years used to enter into much detail on mine accidents and explosions, gave maps that illustrated the whole story and showed interesting devices for promoting safety. Today accidents are boiled down to statistics—the number of victims, the date of the occurrence and little more. We have become calloused to the misfortunes of our mine workers. The story hardly ranks any longer as a headline.

As for the Redding disaster, on which this little preachment was based, it was caused by an uncharted area in an old mine that had filled with water and was potential for mischief. The water escaped through a dyke from a seam higher up and drowned the men. It appears likely that a new law further defining the proper procedure in places approaching water will be passed to prevent such accidents in future or that the Water Dangers Committee will prescribe the removal of all such dangerous accumulations of water. The report recommends the use of more telephones, that the miners be better informed as to emergency exits and that someone be placed in charge of the deputies on the night

shift. One is impressed with the idea that the report gives evidence of an activity that will endure. If in the United States we had an accident Sept. 25 of one year it would be forgotten by April 1 of the year following, the date when the account of this disaster with comments was forwarded by the Mines Department to E. Shinwell, the Secretary of Mines. Is this patience in following up disasters the cause for the low fatality rate per thousand men employed now attained by Great Britain? Is the interest of Parliaments in a disaster of the kind eight or more months after its occurrence a reason why mine accidents are less frequent and less destructive in at least some lands beyond the seas?

### Acquaintance Takes Edge off Disagreements

**W**E HEAR so much about the failure of civilization in the World War and in other ways. We forget that in times past war was the normal state of peoples and that it is still quite a usual condition in uncivilized communities. Where people do not meet, except perhaps in battle, they can imagine all kinds of things about each other. Travel and acquaintance make wars less frequent. It is true that civilization has made them more devastating, but it has also made the public less ready to indulge in them.

To know your neighbor is to arrive at a certain degree of appreciation of him. Many a man has been able to revile another till he met him. Many men with intense animosities are disposed to keep away from their adversaries lest closer acquaintance cause a reconciliation. Few people can harbor a resentment against those they know well.

As the outward appearance of a man is usually a symbol of his character, the press has done yeoman service for international, national and industrial unity and good will by publishing portraits of prominent men. Plant publications always make much use of portraiture. A sort of kindred feeling arises among men who know at least the outward seeming of those with whom they are associated in business and other relations.

We wonder that the press finds so many camera-shy men. If a man has a face that radiates good will, that betokens a spirit of kindness and fellowship, that shows the bearer of it to be animated by good purposes he should not be unwilling to have it reproduced. He may be sure it will do much to promote harmony and good will. Hardly any face is so devoid of manliness and humanity that the publication of an illustration of it will not serve a good purpose and widen the circle of the man's wellwishers.

The candidates for office are wiser in their generation than the average business men. They have their countenances portrayed on banners, posters and cards as an outward sign of the goodly qualities they possess. He is indeed unwise who keeps from the public those features which have endeared him to his associates and will make his employees and the public recognize him as entitled to their goodwill.

A portrait will usually do more good than reams of panegyric. It will have the advantage of absolute truthfulness. A man cannot harbor mean and unkindly thoughts and purposes without their being reflected in his face. Any man, therefore, who knows his purposes square with the public interest will not be unwilling to let the public see his face or learn, as it has been expressed, "what manner of man he is."





*Machine at work in the No. 2 Gas bed*

## Machines Load More Than 100 Tons per Shift In Mines on Paint Creek, West Virginia

A Large Output per Machine Has Been Obtained, But Mining and Shooting Methods Have Not Yet Been So Adjusted to the Difficult Conditions at These Mines as to Get Full Benefit From Equipment

BY ALPHONSE F. BROSKY

Assistant Editor, *Coal Age*  
Pittsburgh, Pa.

AT KINGSTON, W. VA., on Paint Creek, about 30 miles east of Charleston, the Kingston Pocahontas Coal Co. has four loading machines in operation in its mines. All of these machines are doing good work and turning out large daily tonnages in spite of adverse conditions, natural and otherwise. At Burnwell, 9 miles farther up the creek, the Imperial Colliery Co. has one machine at work in its Imperial No. 4 mine. This loader also is doing well both in tonnage produced and in costs registered. The former company began its experiments about 18 months and the latter firm about a year ago.

Both of these companies have gained sufficient experience with mechanical loaders to enable them to accurately sense the requisites for satisfactory machine operation under the conditions existing in their respective mines. Neither has any complaint to make concerning the capacity or productiveness of the machines themselves, both attributing the only moderate degree of success thus far attained from their use to the natural conditions encountered and the methods of mining followed.

NOTE—Coal in headpiece shows the results of heavy shooting. In spite of this, however, much of the coal hangs in the corners and has to be broken down by hand. The flat lumps on the machine are portions of a band of tough woody coal that occurs near the bottom of the bed.

So far as output per machine is concerned both companies have been highly successful, as well over 100 tons are regularly loaded per 8-hr. shift. This compares favorably with the results generally obtained elsewhere. Nevertheless, there still remains room for vast improvement. This will be gained by adjustments in the room layout, track arrangements, the methods employed in shooting the coal, a proper distribution of labor and assignment of duties in well-planned schedules and cycles of operation. All this will take time and study. The resident officials at the mines of each company realize the disadvantages under which their machines operate and the inefficiencies in their present practices, and make no attempt to conceal either. Each day they get new ideas and see ways by which their methods may be improved. Changes are being made slowly but surely.

In the mines of the Kingston Pocahontas Coal Co. the four machines have proved their ability to load coal easily at a rate of one ton per minute, and to move from place to place as rapidly as a cutting machine can be shifted under similar conditions. Nevertheless, they have not been economical when working in rooms, though they save money in entry driving. One mine car after another has been loaded at the rate stated. Throughout December, 1923, each of two machines



working the Eagle bed in the Westerly mine of this company averaged 120 tons in eight hours.

Notwithstanding this excellent performance, however, the labor cost per ton of machine-loaded coal is no less, or at least, not appreciably less, than that of hand-loaded coal. This discrepancy does not lie with the degree of efficiency of the labor employed. The saving made in actual loading is more than counterbalanced by the cost of deadwork.

#### LARGE TONNAGE MAY NOT SIGNIFY LOW COST

It is one thing for a loading machine to be successful in performing its duties, but quite another for it to be economical. A measure of any machine's economy is not the number of tons of coal it will load in a given time, but rather the number of men required to win and prepare the coal, as well as the average return realized per ton on all sizes made. Even under unfavorable conditions the rate of machine loading may be speeded by employing during the off shift enough additional men to prepare the places properly for the operation of the loading machine. A loading machine, however, which may be economical under certain conditions may be quite uneconomical under those less favorable. This circumstance, however, casts no reflection whatever upon the machine itself.

In the mines of this company the Eagle bed exhibits several characteristics of the Pittsburgh seam in the Connellsville region. Both beds yield coking coals; their analyses are similar, and little difference is noticeable in their physical texture. The bottom is of fireclay which when wet makes the shifting of a loading machine difficult. Ten inches of drawslate overlies the coal which has an average thickness of about 7 ft. Above this slate is a soft shale bed which slacks, on exposure to the air and comes down to heights of as much as 7 ft. above the top of the coal.

In places the roof above the Eagle seam, like the drawslate above the Pittsburgh bed, pinches out, leaving in its place a hard sandstone top. Unlike the Pittsburgh bed, however, in limited areas of the mines, a middle parting separates the Eagle seam into two benches. The cover above the mines of this company is much thicker than that generally found overlying the Pittsburgh seam, for the properties are situated in a mountainous section of Kanawha County. The roof breaks without difficulty when the work in rooms and pillars is done in proper sequence.

The many characteristics common to both the Eagle and Pittsburgh beds make practically the same mine layout desirable in both measures. The Kingston Pocahontas Coal Co. drives its rooms 20 ft. wide and 300 ft.

long on 60-ft. centers. Necks are driven 12 ft. wide and about 25 ft. long. Pillars are recovered in practically the same manner in the Eagle as in the Pittsburgh bed. Loading machines are not utilized for pillar drawing. So far as this process is concerned, however, loading machines are seldom so employed anywhere. Occasionally, in the mines of this company, one or two slabbing cuts are loaded out mechanically before the pillar is brought back by the usual methods of hand loading.

The drawslate above the Eagle bed in the mines of the Kingston Pocahontas Coal Co. has prevented material savings being made in the mechanical loading of coal. Where this slate is sound and the coal is loaded by hand, it can be kept in place by careful timbering. With machine loading there is little choice between keeping it up with timber and taking it down. When unsupported for 12 ft. from the face what is apparently sound roof will spring, so that it must be taken down. When the slate is supported by timber a loading machine can be maneuvered only with difficulty, for the timbers have to be shifted, which is a hazardous operation. To take this slate down before the loading machine enters the place is prohibitively expensive, for it costs approximately as much to load it by company men as is saved by the loading of coal by machine. The additional picking, which mechanically loaded coal requires, should be added as another item of expense.

#### NIGHT LOADING ASSURES PLENTY OF CARS

In these mines loading machines are used on the night shift so that a sufficient number of mine cars can be furnished to keep the machines busy. Obviously this is the best procedure to follow, because, if practiced simultaneously, the operations of machine-loading and hand-loading would conflict. The two cannot well be prosecuted at the same time.

To load 120 tons by machine in eight hours 14 men working in two shifts are required. Six men are employed on the night shift—a machine runner, two helpers, a trimmer, a motorman and a trip rider. Sometimes, when the locomotive is coupled to the mine car being loaded, the trip rider trims the coal and picks as much slate from it as he can. In the absence of the trimmer during the shifting of a loaded trip to the parting, one of the machine helpers takes his place. With this arrangement only five men are employed on the night shift.

There should be little need for a trimmer. Mine cars loaded by machine should not be heavily topped, nor can the trimmer pick out much slate so rapidly does the machine load the cars. The two helpers facil-



FIG. 1

#### Drilling Shotholes

Electric coal drills used at the face save much labor. Six shots are ordinarily necessary to bring down a face in the No. 2 Gas bed for loading mechanically as against three with hand loading. Positions of holes to be drilled are indicated by the chalk marks on the face.



FIG. 2

### Squaring Break-through Face

In the Imperial No. 4 mine the mining machines cut a kerf below the 4-in. band of tough woody coal. The strong roof requires little timbering. This allows ready movement of both undercutters and loading machines. A tender roof sometimes requires so much timber that the machines can be maneuvered only with difficulty.



itate speedy loading by shoveling coal at the face into the path of the machine when they are not engaged in picking down hanging coal. With more study will come a solution of the problem of shooting the coal to advantage. This should eliminate at least one of the helpers.

On the day shift eight men are employed in preparing the faces for the loading machine. The duties of four of these men include the shooting of coal, laying of track and timbering. About half the time of a cutting crew, or the full time of one man, is required in undercutting the requisite number of places to yield 120 tons of coal. Three are engaged in handling slate. This represents a heavy labor charge, which is not incurred where the roof directly above the coal is sound.

At least 80 per cent of the coal produced by this company from the Eagle bed is sent to byproduct-coke plants. In consequence, when shooting, no attempt is made to obtain a large percentage of lump. Places are center-cut by breast machines mounted on trucks. The bottom bench, of course, is shot first. From 6 to 10 shots are used depending upon the width of the place. Heavy shots are fired in order to bring down as much of the coal as possible, for no tight corners or hanging coal should be left on any part of the face.

In this 7-ft. bed it might be possible to use loading machines economically merely by top-cutting and leaving about 1 ft. of coal to hold the roof. The saving that might result from not having to handle draw-slate, the greater efficiency secured from the machines themselves and the elimination of part of the labor charge for picking no doubt would more than offset the loss of coal left in the roof.

A 6-ton reel-type locomotive is kept in constant attendance on each loading machine. Until the first crosscut in a room is driven, loaded mine cars are stored on the track of the butt entry. When starting to load a cut a locomotive pushes four empties into the room, remaining with them. After the rear car is loaded, the trip is pulled out of the room and the load uncoupled on the straight track. The locomotive pushes three empties into the room, and so on, going through the same cycle for all but the last mine car. This last car is spotted under the conveyor of the machine, and the locomotive is uncoupled. It then leaves the room, and is coupled to the three loads on the entry, which it takes to the parting, returning with three empties.

In rooms that are further advanced a switch and track are maintained in the crosscut nearest the face

for the storage of cars. With this arrangement little time is lost in shifting. A  $3\frac{1}{2}$ -ton mine car may be filled with 3 tons of coal in 3 min. when the faces are properly prepared. The average time of replacing a load with an empty at the machine is  $1\frac{1}{2}$  min.

Conditions detrimental to the economical use of loading machines in rooms are less serious in entries. These passages are driven 12 ft. wide. Narrow work, as might be expected, develops less roof trouble. For rapid development machines should load two cuts per shift on each entry face.

This company by no means has given up the idea of using loading machines in rooms, for in one section off 14- and 15-right entries the coal thus far mined has a sandrock top which, if it persists, is ideal for loading-machine operation.

### HAVE HAD MACHINES EIGHTEEN MONTHS

During its 18 months of experimentation with mechanical loading the Kingston Pocahontas Coal Co. has attempted to measure the ability of machines to supplant hand labor. Regardless of the outcome of the experience so far gained, it has profited from it. It knows what changes should be made and what conditions must be overcome to make mechanical loading profitable in its mines. Best of all it has proved the worth of loading machines for driving entries.

At the Imperial No. 4 mine of the Imperial Colliery Co., Burnwell, W. Va., one loading machine is used in the No. 2 Gas bed. During one year's service this loader has conclusively established a claim for putting coal on a mine car at a cost less than would be incurred in loading by hand. All work connected with the mining of coal by this machine is performed by company men.

The physical properties of the No. 2 Gas bed of the Imperial No. 4 mine are more favorable to machine mining than those of the Eagle seam in the mines of the Kingston Pocahontas Coal Co. In the latter the coal is 7 ft. thick, and in restricted areas is divided by a 6-in. parting. It has a roof of drawslate subject to weathering on exposure to the air, and a fireclay bottom. The advantages in the Imperial No. 4 mine are such that a saving of 24c. per ton is obtained by the use of the loading machine.

In this operation the roof is of massive blue shale that possesses interrupted cleavage and which stands with a minimum of timbering. Directly above this slate is a 30- to 40-ft. bed of hard sandstone. The cover,





Fig. 3—Double Track to Facilitate Loading

The two spur tracks are joined to the room track by a sliding joint. Four or more cars in a trip may be so shifted by a locomotive as to keep an empty car available for the loading machine most of the time. The track was laid temporarily in order to get the picture from which this illustration was made. In actual practice steel ties are used exclusively.

attaining in places a thickness of as much as 800 ft., is divided at widely separated points by vertical cracks, known locally as "surface seams." The depth to which these cracks penetrate the cover is not known, but it is supposed that they extend into the sandstone because of the apparent ease with which the cover moves along these surfaces of weakness, also because of the flow of water through these channels. Within the coal they may be traced by rusty films or stains.

Though the bottom is of shale, and to all appearances hard, it heaves in some parts of the mine when pillars and barriers take on the weight resulting from a cover that is difficult to break. In one instance 400 ft. of entry heaved even though protected by solid barriers. In pillar sections the bottom often moves over night. This difficulty becomes most serious in drawing the stumps of room pillars, also in removing entry pillars and barriers. In some cases it becomes necessary to lift track, take up the bottom, and then replace it. The characteristics of roof and bottom are not as serious as might be imagined, but those of the roof to a certain extent influence the direction of rooms and the establishment of breaklines.

#### LONGWALL OPERATION TO BE CAREFULLY TESTED

The coal in this mine is mined at present by the room-and-pillar system; the company proposes, however, to test the applicability of longwall faces to the physical properties of the roof and bottom as here set forth. If this experiment is made, the company expects to operate a straight face, and to hold the roof by means of stout cribbing and timbering at such a distance from the face that track may be laid along it. It is hoped that by working the face parallel to the surface seams these fissures may be made to assist in the caving of the cover, and the control of the roof.

Experiments in longwall mining in this mine are liable to prove discouraging, for the roof strata are composed of much hard sandstone and the bottom is soft. It is probable that on a longwall face the cover will subside rather than cave. Furthermore, the subsidence of the cover, which is heavy in this mountainous district, would squeeze the coal and thus heave the bottom.

In room-and-pillar work in this mine an endeavor is made to keep the breaklines parallel to the "surface seams." This cannot always be done, however, because these cracks do not always run in the same direction. As a result the breaklines in different parts of the mine are not maintained parallel. As M. D. Bouldin, general superintendent of the company, puts it, "Judgment, based on changing conditions, and no one fixed theory found in books, must be followed in this matter."

Thus far no attempt has been made to use the loading machine in drawing pillars, though a trial of its effectiveness in this work is contemplated. The method planned is to drive a 15-ft. place through a room pillar, leaving a 12-ft. stump to be mined in two face cuts by undercutting and loading machines.

Mr. Bouldin is a strong advocate of short rooms, insisting that the rapidity with which such places can be recovered reduces the cost of cleanups and the maintenance of timbers and track, and thus more than offsets the expense of driving room entries close together. Where the rooms are driven short, loading machines lose less time in moving from room to room and in waiting for mine cars to be shifted. In this mine a loading machine will move without difficulty from the face of one room to another, a distance of about 500 ft., in 12 min., including the time required to mount and dismount the track wheels.

Rooms are driven 300 ft. long and 26 ft. wide, on 70-ft. centers. In order to obtain more coal from one room cut and to reduce the number of times a loading machine must be shifted, it is planned in new territory to drive rooms 36 ft. wide on 70-ft. centers, without changing their length. Room and track layouts also are so designed as to give the loading machine a fair chance to load coal. Permanent track will be laid with 40-ft. rails, well-ballasted and bonded, and temporary track will be built of 20-lb. rails on steel ties. Room curves will be turned on 30-ft. radii to facilitate the movement of the machine. Three rooms, and perhaps four, will be assigned to one loading machine.

Crosscuts are to be driven in each pillar at intervals of 60 ft., in the last of which, or that nearest the face, track will be laid for the storage of mine cars; empties on the left and loads on the right. A 6-ton gathering locomotive will be assigned to each loading machine and will never be required to travel more than 60 ft. from it when both are working in a room. While the loading

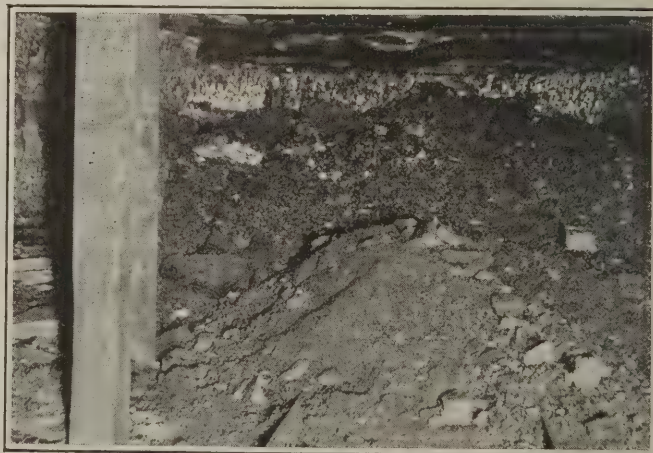


Fig. 4—Face in Eagle Bed Shot Down Ready for Loading

This coal goes to byproduct ovens. Consequently, aside from the expense for labor and explosives entailed by heavy shooting, a large percentage of slack is not objectionable.





Fig. 5—Each Loader Has Its Locomotive

When rooms are short the locomotive may push a trip in and pull it out depositing the loaded cars successively upon the straight entry track.

machine is moving from one room to another, the locomotive will take a loaded trip to a sidetrack on the main entry and return with a trip of empties.

In conjunction with the crosscut haulage system, if feasible, or separately otherwise, it is further proposed to use a double track at the face of each room. These two spur tracks will be connected with the permanent room track by a diamond or double-throw switch. This track arrangement is shown in one of the accompanying illustrations. The entire section is assembled as a unit. Its rear end can be clamped readily with a sliding fit to the rails of the room track. It is shifted by loosening the rail clamps and attaching the section as a unit to the loading machine by means of a chain. With an arrangement involving either or both of the layouts already described, the company hopes to get 140 tons per machine per shift. After methods of loading and haulage are perfected, the No. 4 mine will be worked mechanically, this, of course, requiring the installation of additional machines.

#### DOUBLE TRACK AT FACE QUITE HELPFUL

The double-track scheme should be ideal for use in wide rooms requiring little timbering. A locomotive can shift four mine cars or more from one track to another, keeping an empty car available at all times for filling at the end of each track. While the machine is loading the last car in the trip, the locomotive can replace the loaded cars with empties. Under exceptionally strong roof, free of drawslate, as many mine cars might be handled in a single trip as are required to hold the coal produced by one cut.

The haulage method in use at present is that of backing a trip of empties into a room, loading the car nearest the face, pulling the trip out of the room and dropping the loaded car onto the straight track of the room entry, then backing the remaining empties into the room again, and so on. While the last car is being loaded the locomotive makes a trip to the sidetrack with loads and returns with empties. Rooms must be short and the tracks in them kept in good condition to justify this method. At best it is not as satisfactory as either of the arrangements described.

In the Imperial No. 4 mine the problem of shooting the coal in such manner as to facilitate the efficient

use of machines has not been solved. In this operation the No. 2 Gas bed has an average thickness of 5½ ft. It is clean and does not carry the thick parting that occurs in some localities in this measure and in the Eagle bed that lies below it. From 2 to 4 in. from the bottom is a 4-in. band of tough woody coal, scarcely fazed by the bits of an undercutting machine. The coal is undercut below this band. The general practice of the district when shooting this seam for hand loading is followed. One center and two rib shots are used by which the bulk of the coal is adequately dislodged. The bottom band, however, falls flatly upon the mine floor. It usually is broken into such sizes and shapes as can be handled by hand but not by machine.

For this reason, where the coal is loaded mechanically, three light shots are used to break this band into small lumps before the shots above them are fired. The bottom shots, if charged sufficiently to accomplish the purpose for which they are intended, together with the roof shots, make more than the usual quantity of slack. This coal can be correctly shot only by cutting above the hard band. The objections to this method of shooting are obvious, however, if the recovery of this band of coal is desired.

The best record yet made for a single 8-hr. shift is 136 tons. Over a period of 104 full-time working days the machine loaded an average of 112.5 tons per 8-hr. shift. This average output was computed by multiplying the average hourly output over this period by 8. It includes delays due to minor adjustments of the machine, and those resulting from moving the machine and shifting mine cars but not protracted delays.

Nine men will cut and load the tonnage mentioned. The loading machine runner has two helpers. It is reasonable to suppose—as was pointed out in the description of the use of loading machines at the mines of the Kingston Pocahontas Coal Co.—that the services of one or both of the helpers may not be needed, after mechanical loading has been thoroughly systematized.

Two utility men lay track, set timbers, load bugdust and drill shotholes under the direction of the shotfirer in the rooms loaded out by machine. A crew of two men on a 6-ton locomotive is also assigned to the loader. Though mining-machine men are paid by the ton, on a man-day basis the labor of one man can be charged against the loading machine, for a crew of two men can cut twice as much coal in one shift as can be loaded out by one machine in an equal period of time.



Fig. 6—Tipple at Burnwell, W. Va.

Monitors are used to lower the coal from the upper headhouse, or that serving the No. 2 Gas bed. Coal from the lower headhouse, which serves the Eagle bed, is lowered by conveyor.



# Mine Safety Due for a Boom in Illinois When New State Council Sets Pace for National Drive

St. Louis Meeting Called by National Safety Council Hears Two-Day Program of Discussion from Rock Dusting to Death by Gas—Hundred Mine Men Want Whole State United!

**M**INE SAFETY may take a boom in Illinois. A hundred coal-mining men spent two days talking about it in the Statler Hotel in St. Louis, Mo., June 25 and 26, and wound up by laying the groundwork for the "Illinois Council of Mine Safety," an organization that is aimed to lead the country in mine-safety effort. The St. Louis meeting was engineered by the National Safety Council's mining section and brought together coal-company officials, mine-safety engineers, Bureau of Mines field men and regional representatives of the National Safety Council.

The proposed "Illinois Council of Mine Safety" is intended to have a broader scope than the St. Louis meeting. It is to draw together every element and organization that ought to be interested in making Illinois mines and Illinois miners safer. D. D. Wilcox, superintendent at Gillespie, Ill., for the Superior Coal Co., who presided through part of the meeting, is inviting a representative list of men to organize the new state council and project it next fall. Such a council is expected first to unite everybody in a great and continuous safety campaign, to generate enthusiasm for it and to lead the way for a national mine-safety council soon to be created in state sections by no less an authority than the President of the United States.

C. L. Colburn, of the U. S. Bureau of Mines, proposed that something of the sort be done so as to continue the interest that the St. Louis meeting aroused, and W. D. Ryan, also of the Bureau, actually put the state council idea into words and moved that the words be crystallized into action. And it was done.

The St. Louis meeting gave opportunity for four sessions at which many mine-safety problems of haulage, rescue, explosion prevention, safety training and medical phases of mine care were discussed in competent papers. The discussion ranged from rock dusting and ventilation down to the exact method by which black-damp kills a man, with many features between, including two noon luncheons and a picture show. W. H. Cameron, managing director of the National Safety Council, ran the first day's sessions and Mr. Wilcox those of the second day.

## ALTOGETHER TOO MANY HAULAGE ACCIDENTS

Seeing that about 35 per cent of accidents in mines are haulage accidents, some changes ought to be made in haulage methods, Ralph D. Brown, superintendent for the O'Gara Coal Co., told the conference. He recommended first that rolling stock be of a type fitted for

its job and that it be inspected regularly by someone, probably the bottom boss. A proper choice of men for haulage work also is important. Motormen and trip riders should be selected from among men whose youth, activity and sobriety qualify them for the work. Nor should any man ever be put to hauling coal without careful instruction in his job. They should be men who will accept the safety doctrine. And their bosses should set them, and every other man in the mine, an example in safe conduct that cannot be overlooked.

As for making track and roadbed do their bit for safety in haulage, Mr. Brown urged that the old easy-going idea of letting a track take care of itself be

forgotten. Haulageways should be as straight as possible and, of course, level, and should be carefully maintained at all times. Concrete roadbeds under main haulways have proved economical in the mines. Entries ought to be clear of rubbish and the side clearance of the cars should be ample. Mr. Brown would establish and enforce speed limits for trips. Man trips should

never exceed six miles an hour. Storage-battery locomotives are safest for gathering work where cars are not larger than 2½ tons capacity.

Mr. Brown would have every car blocked at the face to prevent its rolling away and would have derails at the lower end of every grade parting. In all mines where there are any grades of consequence he would have a pointed iron drag at the tail of every trip to act as an automatic brake in case the trip gets split. Where mule haulage is used he solemnly recommended that the bosses insist upon good treatment for the mules. "A mule never forgets an insult," said he, "and vengeance is certain."

## O'GARA MINES HAVE ONE BOSS TO FIFTY MEN

In the discussion that followed, Mr. Brown declared that the best way in any mine to promote safety is to inculcate the idea by personal enthusiasm on the part of shift bosses. They are the men closest to the employees, and if each boss has no more than 50 men he can give each one some individual attention. That is the O'Gara arrangement, and in addition, the company has two safety inspectors ranging through the mines all the time. Electric lights underground also are important. The O'Gara company has them at every door, switch and curve on the haulageways.

Accidents in mines cost about \$20,000,000 every year in this country, Alexander Miller, of the U. S. Bureau of Mines station in Vincennes, Ind., estimated: of this

## SAFETY ENTHUSIASM AT ST. LOUIS

**A**LLEXANDER MILLER says we know pretty well the causes of accidents and how to prevent them. Now it's merely a case of getting down earnestly to the work of accident prevention. And yet there's always something new to say and learn. The St. Louis meeting proves that, if you need to have it proved.



about \$8,400,000 is assessed against companies for fatalities and \$11,000,000 for non-fatal accidents. But we pretty well know all the causes of accidents and how to prevent them, so now it is merely a case of getting down earnestly to the business of prevention. The best weapon against accidents is personal contact between safety bosses and their men.

Mr. Miller traced the development of safety training and mine-rescue work by the Bureau of Mines from its beginning early in this century, down to the present with its ten mine-rescue and instruction cars and its record of having trained 26,126 men in the use of the self-contained oxygen apparatus. He described minutely what should be done at a mine after an explosion and just how rescue work should proceed.

In the discussion on training men in safety, the point was made that some special little recognition ought to be paid safety men by their companies, if it is no more than giving an annual dinner to those who complete the safety-training course of the Joseph A. Holmes Association. This would make the safety men recognized by every one around the mines. It was suggested that



**Appearance of Roadway Before Rockdusting**

This same roadway, which is in Indianola mine, is shown on page 46 as it appeared after it had been rockdusted. However, the floor of this roadway as shown here was covered with rock dust when the photograph was taken, for the finest dust from nearby rockdusting was carried by the current and deposited on the floor.

as foremen and mine managers are so important in making a mine crew think safety and as these men so often lose interest in safety work as soon as they pass their necessary examinations, they ought therefore to be required by law to take a safety examination every year.

#### SO WELL SOLD ON SAFETY THEY STEAL EQUIPMENT

C. F. Anderson, mine manager for the Valier Coal Co., had a puzzle to be solved. Every time his company equipped first-aid stations in the various parts of the mine for emergency use, within one single day, the equipment was all stolen right down to the wooden cabinet and the stretcher. Those were too big to go in a pocket or a dinner bucket. D. D. Wilcox, superintendent of the Superior Coal Co. had an answer. Said he:

"There always will be thieving. We lost as much safety equipment as anybody, so long as it was public property and free of access to anybody in the mine. So now we designate our safety men and post their names and locations on the nearest telephone or section office. When a safety man is called, he goes to his own

individual lock box in the underground hospital where all the first-aid equipment is kept. This makes him personally responsible for his outfit. Periodic inspections of his box also help to make him keep the equipment intact and in good condition."

Rock dusting, of course, was an absorbing topic. The main paper on this subject was one written by Thomas J. Fear, general superintendent of the Inland Collieries Co. of Indianola, Pa. Mr. Fear was not present. In his absence W. D. Keefer, new director of industrial safety, National Safety Council read his paper. His warning that an explosion can be propagated on only three hundredths of an ounce of pulverized coal in suspension per cubic foot of air, brought home to the conference the danger of such coal dust. His recommendations for reducing it got close attention. He recommends rock-dust stemming for shot holes, saying that it reduces the quantity of explosive needed 10 to 30 per cent and increases the proportion of lump coal 10 to 25 per cent.

Mr. Fear recognizes the value of sprinkling in mines and humidifying air, but each is decidedly uncertain in the degree of protection it affords. Therefore, he urges rock dusting. The Bureau of Mines experiments show coal dust to be explosive when it is fine enough to pass through a 20-mesh screen and that rock dust to nullify its inflammability should be not more than 2 per cent combustible and fine enough so that all will pass through a 20-mesh and 50 per cent of it through a 200-mesh screen.

At Indianola the first machine for dusting applied 80 lb. of dust per minute through a 2-in. nozzle at 60-lb. air pressure. It had a stationary Y-shaped outlet which did not secure uniform deposits of the rock dust in cuts, manholes and such places. The machine now used has a 4-in. movable nozzle and a maximum capacity of 10 lb. of dust per minute. The velocity of the rock dust sweeps the lighter coal dust from ribs and roof. This is not deposited on roof and ribs further along but is apparently weighted down by the rock dust and falls to the floor. Such dusting now gains a credit for mines practicing it in Pennsylvania from the state compensation rating bureau.

#### LESS THAN CENT A TON DUSTS MINE

During the past month in the Indianola mine, 46,000 ft. of entry were dusted with 105,400 lb. of dust, averaging 2.3 lb. per lineal foot. The total cost was \$505.73 or \$0.007 per ton of coal mined. The deduction thus won on insurance costs was about \$0.0015 per ton. Dust cost \$4.40 per ton and handling is charged at 50c. per ton. The cost of this first dusting is \$0.011 per foot, but repeated dustings each three or four months it is estimated will cost between \$0.003 and \$0.004.

Mr. Hayden, of the Cosgrove-Meehan Coal Co., wanted to know how much moisture stone dust in a mine will absorb out of the air current. James Towal, of the E. I. du Pont de Nemours Co., estimated it at 2½ per cent. Superintendent F. F. Green, of the Valier Coal Co., one of the active dusting companies in Illinois, said the natural moisture content in freshly pulverized shale makes it stick to roof and ribs to greater depth than coal dust.

From this the discussion veered off into an argument over the increase in blowout shots in recent years over "the good old days." Some blamed it on poorer supervision of miners but most of the disputants laid it



simply to the greater present-day ignorance of the so-called miner in this country and his unwillingness to snub his cut as required, preferring to blow it all to pieces with overcharges of explosive. Nobody had any remedy for this overcharging except that all loading and shooting of holes should be company work, done by a few skilled men in each mine who can be properly supervised.

The conference lunched in one of the large private dining rooms of the hotel at noon of the first day, and saw the Peabody memorial film, "When a Man's a Miner," shown by the Bureau of Mines. These mining men silently and interestedly watched the full four reels of the story of "Lucky" Burns, detecting but one technical flaw and that a slight one: One of the rescue teams traveled much faster than the prescribed speed in exploration. Otherwise the picture pleased them, though it was freely remarked that the dramatic moments rather missed fire.

In the afternoon session Superintendent Wilcox, of the Superior Coal Co., read a paper on ventilation and dust control. He declared that at many mines a heavy expense from ventilation leaks and improper disposition of air currents is sustained without that fact being realized. He reviewed many of the common causes for those losses, such as sharp turns and sudden restrictions in aircourses which might just as well be removed. In discussing stoppings, he said his company had discarded ash and cement blocks as too porous and now has standardized on concrete blocks, set deeply into roof, ribs and floor.

#### JUST A LITTLE GUIDING AT FOOT OF DOWNCAST

The volume of air input frequently is 100 per cent in excess of mine requirements yet the men at the faces do not get enough air. There may be too much space allowed—or too little around the top of the downcast, or the cutoff may be in the wrong place, or the air may be required to make too short a turn. At one of his own mines, the right-angled turn where the downcast met the bottom set up eddies of various kinds and greatly reduced the delivery until a V-shaped contrivance was built into the bottom with its apex upward. This forces the air both ways and practically eliminates eddies. Today, in one of the Superior mines 200,000 cu.ft. of air per minute is delivered by an 18x6-ft. fan with a water gage of 0.7 in., the mine spreading more than a mile in each direction.

James Towal, of the E. I. du Pont de Nemours Co., discussing the safe handling of explosives said it is unfair to expect the powder companies to replace steel powder kegs with other material just to keep foolish miners from exploding them by driving in the bungs with picks. If powder got the respect to which it is entitled there would be no such accidents. He laid down a few rules for handling explosives at the face such as: Carry no matches or open lights, load shotholes gently, use electric squibs, tamp shotholes out clear to the face of the coal and shoot one hole at a time with a battery.

#### RECLOSING CIRCUIT BREAKERS ON SMALL LINES

"Six bushels of advice on preventing accidents from electrical equipment," a paper written by L. C. Ilsley, of the Bureau of Mines, was read by E. J. Gleim, of Pittsburgh, Pa. Each "bushel" dealt with one problem such as electric-shock prevention in which he advised grounding the frames of all surface motors, guarding all live or moving parts and leaving ample

clearance around all feeder lines. The other "bushels" dealt with gas ignition, dust ignition, explosives hazard, electric haulage and mine-fire preventions. Mr. Ilsley's paper drew some fire by stating that automatic reclosing circuit breakers are safe only on main lines and not on small feeder lines. Mr. Gleim said he thinks Mr. Ilsley believes there is danger of such a breaker closing when the "short" is brief and less than a certain load.

#### MINERS THINK SAFETY THE OPERATOR'S FAD

The essential work of reaching the miners with the safety doctrine can be done better by the Bureau of Mines through its Joseph A. Holmes Mine Safety Associations than by the National Safety Council which called the St. Louis conference, W. D. Ryan declared. He is a Bureau of Mines safety commissioner but he insisted there was no animus against the National in his words. He merely insisted that the National has not the equipment nor the talent to do the bedrock work among miners. So he urged close co-operation between the National and the Bureau, each doing its own special service.

"There ought to be some miners here at this meeting," said he. "They are the men about whom we are



Laying the Dust on Thick with Projector

Scene in Indianola Mine, of Inland Collieries Co. There is a certain distance at which the nozzle of the projecting equipment should be held to get the best results.

talking. They are the fellows over whose safety we are worrying. They should be given prominent places upon this program instead of putting on four Bureau men as was done."

It was replied that all Holmes chapters in Illinois and President Frank Farrington of the Illinois miners had been invited and that Vice-President Harry Fishwick had tentatively accepted because of Farrington's illness; but Mr. Ryan reported talking to Fishwick only the night before in St. Louis, and Fishwick had said he wasn't coming.

"Then it's the miners' own fault," said J. S. Anderson. "They evidently were invited and they apparently regard the meeting as something the operators have concocted and which, therefore, should be scorned." He complained that this attitude of the union is what makes it hard to train safety men. When a Bureau car comes into a mining town in Illinois to conduct classes, only 15 or 20 out of possibly 800 union men attend, and these do it rather warily because they are liable to be suspected by the union as trying to curry favor with the company. In any event miners listen more readily



to the orders of the union than to those of their employers.

Mr. Ryan, in his address, "What the Joseph A. Holmes Safety Association is Doing For Accident Prevention," stated that in spite of the financial losses of \$20,000,000 or more annually to coal operators through accidents, many operators will not help in the safety work. One in Montana even refused to pay a safety-trained miner for a day he lost taking care of a buddy hurt in the mine, who otherwise would have died at heavy compensation cost to the company. This sort of refusal to co-operate is one of the obstacles in the way of safety.

However, Mr. Ryan also had some cases of the union refusal. He cited the Oklahoma case where the district union organization of "bolsheviks" stands by State Inspector Boyle, in opposition to the introduction of safe electric cap lamps in Oklahoma.

#### MINER IS NOT BEYOND ARGUMENT

He took issue with declarations of others that it is no use trying to educate the miner in safety. He insisted it can be done if it is tried right, for the American miner is not the ignorant roughneck he is often pictured. In 1920 it was found that 88 per cent were literate and only 30 per cent foreign born. Of these foreign born four-fifths had been in this country 10 years or more. Safety education will reach them and 75 per cent of accidents can be eliminated. He made some safety suggestions. Here they are: Use closed lights in all gaseous mines. All drilling, loading and shooting in order to reduce blown out shots should be performed by company men. No mine examiner should be allowed to use a safety lamp he can unlock. If that had been done the Hastings and Kemmerer disasters and many other explosions could have been avoided. Every miner should be required to test the roof of his place every morning before anything else is done. Permissibles should be required in all mines where there is reason at all to use them. Joseph A. Holmes chapters should be installed in every mining camp.

After hearing some bitter complaints that the Holmes chapters so often die or suffer dry rot, James Boston, safety man for the Superior Coal Co., Gillespie, Ill., laid his cob pipe on the edge of the speaker's table and said the chapter was working fine in Gillespie and he'd tell the world why. It's got to be that way anywhere if safety is going to amount to anything. The company does its part by supplying all the necessary equipment, by seeing to it no miner loses pay for time he spends in safety work and by otherwise meeting the men half way. The men are stimulated to work at this safety business and they do it. Hence there are mighty few accidents at Gillespie.

But before Boston picked up his cob pipe again, he flayed the operators of the country for not supporting safety work. Through somebody's neglect or refusal to put up money, the Huntington national first-aid contest was called off. The union didn't cancel it nor yet the Holmes associations. Someone else did. The same thing happened to the Illinois state meet to have been held at Belleville and this made the Holmes chapter at Gillespie so incensed that it is going to put on the state meet next fall under its own auspices and has raised most of the money already from union organizations and individuals.

There were some queries as to just what the Joseph

A. Holmes Mine Safety Association is, anyway, and how to organize chapters. So C. L. Colburn traced its history since it was started under the protective wing of the Bureau of Mines in 1916 as a memorial to the first director of the Bureau in place of erecting a cold monument in Washington. Some twenty-four organizations besides the Bureau joined in forming it. There are now ninety-six chapters in mining towns, about sixty of them virile.

#### HOW ASSOCIATION WORK IS FOSTERED

Any operator or union local can organize one among any group of miners and get the assistance of the headquarters in Pittsburgh, Pa. In Illinois the state department of mines and minerals or any state inspector will help. Dues of from \$10 to \$50 a year, depending upon the size of the chapter, are paid by each chapter, none of which is spent for salaries or traveling expenses by any of the national officers or directors—a list which includes the Director of the Bureau as president, and officials of the National Safety Council, the United Mine Workers and other organizations. The headquarters issue buttons to all members, many safety bulletins and instructions, sends out speakers and otherwise fosters the work of the chapters. It is now broadcasting safety talks by radio from Pittsburgh.

Mr. Colburn said safety is like a business: When it is properly directed it pays. Dividends go not to stockholders alone but to companies, employees, their dependents and everybody else who is interested. Of course accidents produce compensation in money to men who get hurt, but does money pay for the lost arms and legs and eyes? How much finer humanitarianism it is to save those arms and legs and eyes by safety practice!

To really practice it, he said, not only must a mine property be made physically as safe as possible and equipped with the necessary safeguards, but, more important still, company officials must be enthusiastic about safety and preach it by word and deed, and employees must keep up an aroused interest even after they have been instructed in safe practice. This usually can be done by giving them active parts to play in some phase of safety work or in the Holmes Chapter's activities. It was here that Mr. Colburn proposed the Illinois state safety council, the plan for which was started before the conference adjourned.

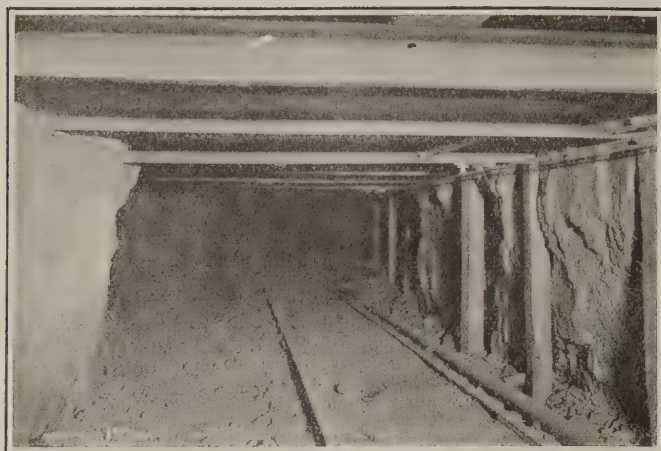
#### OXYGEN FILTERS INTO HEMOGLOBIN

Just what do mine gases do to the human body? How is it that they kill? In A.B.C. fashion and most interestingly Dr. H. G. Bristow, professor of chemistry at St. Louis University, talked about this subject, referring especially to common mine gases such as carbon dioxide and carbon monoxide.

He began by explaining that a man inhales air in order to deliver oxygen into the blood stream where it is carried in chemical combination with the hemoglobin or red matter in the blood corpuscles. In the lung tissue it filters into the hemoglobin much as water at different levels, separated by a finely perforated partition, would run from the high-level side into the low until equilibrium is attained.

So long as the blood coming into the lungs is low in oxygen, the oxygen from the air will continue to be absorbed. Then the blood carries it to the tissues of the body structure where the oxygen content is low and the carbon dioxide (caused by muscular effort)





**A Dust-Coated Mine Haulageway**

This is the roadway shown in the illustration on page 43. Only the form of the coal surfaces remain after rockdusting. The coal is so covered with limestone dust that it looks just like rock. A drill or a pick almost would be needed to convince one that the coal thus disguised was coal and not rock. Yet the coating can be rubbed off readily by the hand and is so loose that a blast would not fail to dislodge it.

is high. Here the carbon dioxide runs into the blood and oxygen into the muscles until equilibrium is attained again. Thus the process goes steadily on so long as the air a man breathes has an oxygen content of at least 12 per cent. It normally is about 20 per cent.

But if the man's a miner and runs into carbon dioxide in the mine, the air he breathes may have less than 12 per cent of oxygen. Then it cannot deliver oxygen into the blood. There is so much carbon dioxide present that his lung air cannot remove from the body the carbon dioxide the blood has brought in. The result is suffocation in short order.

If the man is resuscitated, however, his recovery is rapid, for the lungs contain no less than 100 sq.yd. of contact surface for the passage of oxygen and carbon dioxide between blood and breath and a large volume of both can be transferred within a few minutes. Normally a man inhales 1,200 quarts of oxygen and exhales 100 quarts of carbon dioxide in a day of average activity.

The other gas, carbon monoxide is more dangerous than carbon dioxide because, when it filters into the blood it forms an absolute chemical union with the hemoglobin of the blood and is not unloaded at the other end of the line. It remains in combination, thus effectively putting the red corpuscles out of business. They can neither carry in oxygen nor carry out the gas of worn-out body tissue.

The hemoglobin absorbs carbon monoxide 300 times as readily as it does life-giving oxygen, so that a trace in the lungs soon saturates all the red corpuscles in the blood, even though there may be much oxygen present. As little as six parts of carbon monoxide in 10,000 parts of air makes a man drowsy in half an hour and 50 in 10,000 produces unconsciousness in that time. Higher proportions such as are encountered after mine explosions kill a man in a few breaths.

#### **JUST SUFFOCATED BY GAS, NOT POISONED**

"However, these gases are not poisonous," said the doctor. "It is a common fallacy to think so. They kill merely by the mechanical action of preventing the body from getting rid of its own waste matter through the breath. A man is not poisoned to death by them at all. He is just suffocated. After resuscitation he is left without any detrimental after-effects.

"There are only a few poison gases made in mines. About the only one ever encountered, is what the miner calls 'stink damp.' It is a combination of hydrogen called hydrogen sulphide and certainly is well named a 'stink' gas. It advertises its presence so well and is in such small concentration in the air that a man is almost always able to get away from it. Also it acts slowly although poisonous, and altogether is no menace at all compared to the non-poisonous gases."

#### **ANIMALS IN MINES CAUSE INFECTION OF WOUNDS**

It was remarkable how much interest Dr. J. B. Moore, of Benton, Ill., could arouse in the subject of "Infections from Wounds." After considerable experience in the heart of the southern Illinois coal field he declared that it is fallacious to believe that the sulphur in mine water in any way promotes infection. As a matter of fact sulphur is an antiseptic. Mine water is by no means as poisonous as many mining men think. Even water in a long abandoned mine ought not to be infectious even though timbers may have decayed and fermented because there are few harmful bacteria in wood and many helpful kinds. It is usually animal matter that makes mine water dangerous. Animals in mines always add to the likelihood of infections in men's cuts and injuries. Thus the motor-haulage mine is safer in this particular than the mine in which the mule is used.

Dr. Moore had much to say about the value to a miner of clean clothes next his skin, though the outer garments may be filthy. He condemned the use of any sort of soiled cloth for temporary dressing of wounds or slight skin injuries. The mine bathhouse makes the skin of today's miner far cleaner than that of the miner of long ago and thus greatly reduces many health hazards.

A discussion of eye injuries and first-aid treatment roused almost the whole conference to speech. The doctor said any man who gets even a slight eye injury should drop his work and go to a doctor at once for infections can set in within a few hours. Many a good eye has been sacrificed because a buddy attempts in all kindness to remove some foreign matter from a miner's eye with the corner of a dirty handkerchief. M. L. Felmer said southern Illinois coal, for some reason as yet unknown, seems to have a peculiar power to infect eyes.

#### **FIRST-AID MEN SHOULD NOT TREAT EYES**

James Boston remarked that at Gillespie good first-aid work appears to reduce trouble from eye accidents. This roused Dr. Moore who is absolutely opposed to the first-aid men at mines treating slight eye injuries. There is too great danger of the patient regarding such temporary treatment as permanent. Many unsuspected infections have developed from such treatment and run into dangerous stages before a doctor ever sees them. Too often mine first-aid kits become contaminated from improper care. This is one reason why the local doctor often is blamed for failures to save eyes that he treats. After an ulcer gets a foothold even a specialist seldom can restore the eye without blemish and often cannot save the sight. Such ulcers can develop overnight. Therefore, Dr. Moore said, no man ought ever to go to bed with any eye injury untreated by a competent physician.

The conference ended late in the afternoon of June 26, its second day.



## What Does the Power That We Needlessly Waste Cost Us?

Abuse of Electric Service Frequently Costs More Than Its Use—Most Abuses Corrected by Actual Meter Readings

BY CHARLES A. SWARTZ  
Springfield, Ill.

AT A LARGE number of mining operations, where most of the houses are occupied by mine workers or salaried employees, it has been the practice to supply—either without charge or else on a flat-rate basis—the electric energy used for light and other purposes in these houses. With no check imposed on the use of the service, the shiftless and irresponsible elements of the communities naturally let the electric lights burn without regard to their proper use or to company interests.

Where electric service was supplied free, the whole burden of such extravagance was borne by the owning company. But where the flat-rate system prevailed, waste of current, by increasing the expense to which the company was put for supplying the service, compelled an increase in the flat rate charged. This increase naturally had to be borne by the better element in the community as well as by those whose wastefulness brought it about.

The inequity of such a system became apparent to the management of many mining companies and has resulted in the introduction of the system which experience in the general industry of supplying electric light and power to the public has proven to be the only just and practicable method of creating true service economy. This is the system of measuring the energy supplied to each separate customer and basing the charges made to him on the individual energy consumption indicated by periodical meter readings.

### GENERAL SOCIAL ADVANCE FOSTERS METERING

The introduction of this system of metering the electric energy supplied to the homes of miners and other workers living in communities where the furnishing of electric light and power is a service performed by the chief local industrial plant, has, in a measure, been accelerated not only by progress in plant management but by the general social progress of the entire country. As has been outlined the principal factor in making the system of supplying electric energy gratis and unrestricted, or of furnishing it on a flat-rate basis, too expensive to continue, was the shiftless habits of some of the people in the communities served. The effect of such extravagance was, of course, mitigated by the economy in electric service characteristic of the better class of the community. However, with the increasing development and adoption of electric flat-irons, washing machines and all manner of electric household appliances, this better element—because of superior industry, thrift and self-respect—aspired to the use of these devices and began rapidly to increase its average consumption of electric energy. Consequently, such aspirations, though laudable, added substantially to the burden borne by the employing industry supplying the free or flat-rate electric service.

Because of these conditions, as has been stated, numerous progressive coal-mining companies have installed watt-hour meters in their company houses.

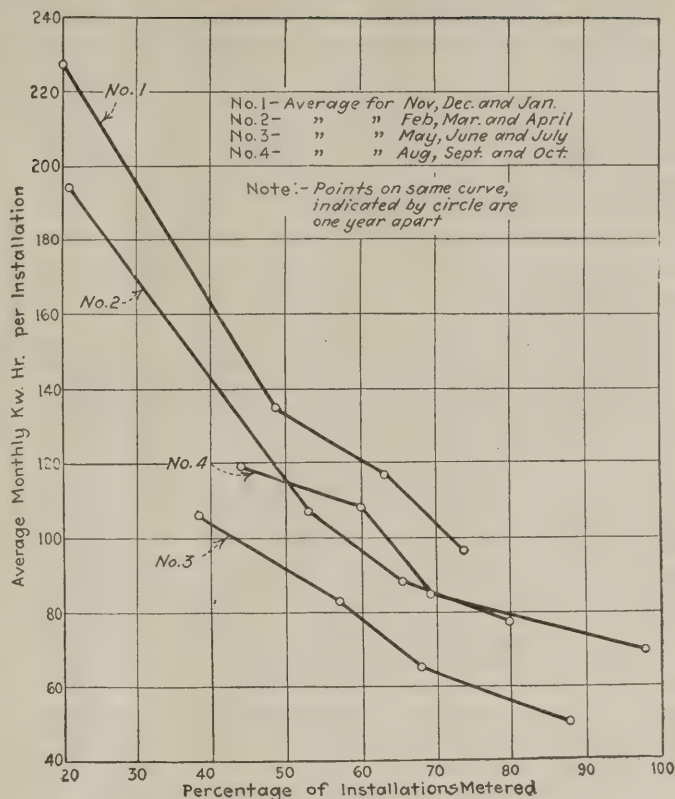


Fig. 1—Curves Showing Waste Reduction

This shows how rapidly the needless waste of electric current decreases when the quantity actually consumed is once known. So long as anyone receives current gratis or on a flat rate there is small incentive to save "juice."

Many interesting results followed. For instance, one superintendent who had been paying a flat rate of \$1.50 per month found himself presented with a bill for \$18, based on a nominal charge for energy shown to have been actually consumed during the first month after his meter had been installed. As may be imagined reasonable economy in the use of electricity in his household quickly came about after this mine official had paid his first bill.

Whether the excessive use of free electric service by such officials arises from an indifference comparable to the shiftlessness of a certain type of miners, or from a feeling on the part of the former that unlimited use of such service is a perquisite properly appertaining to their position, such instances establish the fact that watt-hour meters can be quite properly placed on the premises of all classes of mine employees. The extent to which extravagant use of electric energy declines on installation of electric meters is illustrated by the fact that one company, after being forced by such extravagance to install these instruments found that after such installation 15 per cent of the users did not consume enough electricity, figured at 8c. per kilowatt-hour, even to equal the company's minimum charge of 75c. per month.

Further details of the workings of meter installation toward a reduction of waste is illustrated by the accompanying curves. The company from whose records these curves were made was active in both manufacturing and coal mining in a certain town. As it owned the principal local industries, it supplied electricity on a flat-rate basis to all the houses in the community.

It was decided to install watt-hour meters. The placing of these instruments extended over a period of three years. In Fig. 1, the curves plotted show average



kilowatt-hour consumption per installation at corresponding periods in successive years as the metering of consumers' circuits progressed. The points upon which each curve is plotted represents yearly periods. Fig. 2 is a composite of the four curves and makes evident the trend of energy consumption per connected user, as the percentage of metered houses increased. The downward slope of this curve is significantly indicative of the economy effected through the use of these meters.

#### METERING ALL HOUSES INCREASES ECONOMY

This economy can be summarized by stating that at the beginning of the period under consideration there were only 76 meters installed among 382 houses served, with an average monthly consumption of 220 kw.-hr. per house. After three years, 709 out of a total of 712 consumers were on a meter basis and average monthly consumption had fallen to 62 kw.-hr.

Even with watt-hour meters installed, the determination of an equitable charge for electric energy supplied by coal-mining companies to the homes of their workers is not always easy. For instance, there is the problem of floating population. Some mining companies install meters only in houses occupied by salaried men, and other classes of consumers whose interests are regarded as permanent.

By subtracting the aggregate quantity of energy passing through these meters from the total output of current shown by the totalizing meter registering the energy supplied outside the company plant, the quantity of current furnished the miners is determined. A charge is made in proportion to this total quantity of energy, the charge being divided among the whole body of miners.

As an inducement to economy, a charge for service is made to the metered consumers only when the energy used passes a certain figure. As a result, power consumption is kept within close bounds. For a consumer in this class to run over the quantity given free

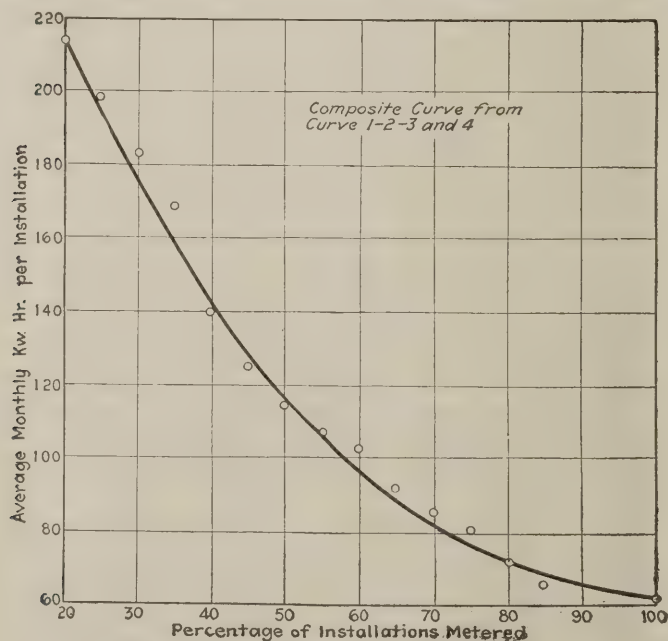


Fig. 2—Curves of Fig. 1 Combined

With no yardstick to serve as a measure anyone may consider that he is saving in his use of electric current when, as a matter of fact, he may be highly extravagant. Installation of a watt-hour meter immediately furnishes the householder with a means for comparing his current consumption from month to month and enables him to judge for himself whether he is frugal or extravagant.

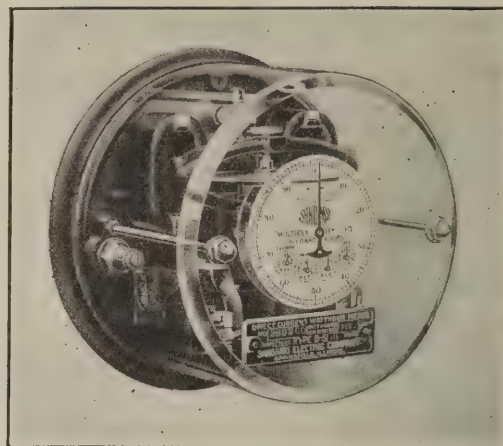


Fig. 3—Direct-Current Watt-hour Meter

It is useless and illogical to demand economy in power production and permit unchecked extravagance in its use. Installation of an instrument such as this in the supply line or power circuit prevents "saving at the spigot and wasting at the bung hole," as electric current too often is handled at mining plants.

is exceptional. It is estimated that the power consumption among this class is now hardly half what it was before the installation of meters.

In order to drive home to the miners the need of economy in the use of electric current in their unmetered houses, the flat rate was increased 60 per cent. The miners were told that the new rate would be reduced as soon as they became more economical of the service. Up to the present time, however, no evidence of such economy has become apparent.

Apropos of economy in the use of electric energy in the homes of company employees, it seems rather inconsistent to insist upon such frugality without taking effective steps to accomplish similar savings in the company's plant itself. Power costs in coal mining are appreciable, and the proper use of watt-hour meters can effect substantial savings whether the energy used is purchased from a central station, or generated at the mine.

It is of little use to require the plant engineer to make power from bone coal or "dirt and dust," in order to save marketable fuel for sale, if the economy thus effected is offset by waste of the power generated. It is of little use to install carbon-dioxide recorders and other up-to-date boiler-room instruments for checking up economy in power production, unless suitable instruments are also employed for checking power consumed.

Some of the places where power may be wasted are the haulage circuit, the breaker or tippie drive, the ventilating fans, the coal cutters, the air compressors, the electric mine pumps, and the like. If power is purchased, it is certain that the central station company supplying that power has a meter on the feeder through which energy is transmitted to the mining plant. It is, therefore, equally as important that the mine operator should have his own meter on his end of the feeder so that he can check up intelligently the power bills his company must pay. If the bills show that his company is being charged for more electric energy than the watt-hour meter indicates was consumed by his plant, there is obviously a difference between the meter on his end of the line and that installed by the power company. When such differences occur, both meters should be tested and the trouble rectified.

In order to determine the cost of the various mine



operations, the cost of power consumed in them must be charged into the total figure. Unless watt-hour meters are installed on the various circuits supplying such power, it is impossible accurately and conveniently to determine these power costs. Neither is it possible, without such meters, to check up and detect power wastes that may cause appreciable losses.

In this connection, note the extensive employment of watt-hour meters on street cars. Such meters so installed provide a continuous record of operating economy. By simply dividing the power consumed by the mileage multiplied by the load, the efficiency of both car and driver can be easily determined. Knowing that such a check is placed on their work, motormen are more careful than they would otherwise be. It is estimated that from 10 to 20 per cent saving in power is thus effected in street-car operation.

The same principles apply to the operation of electric mine locomotives. Progressive mining companies are already demonstrating that similar economy can be affected in the department of mine transportation.

Still another advance toward power economy obtainable from the use of watt-hour meters on mine locomotives can be gained by installing a totalizing watt-hour meter on the main haulage-circuit feeder. By subtracting the aggregate energy consumption of the locomotives from the total energy supplied the haulage circuit, as shown by the haulage-feeder meter, any excessive absorption of energy by reason of poor rail bonds, feeders of insufficient cross-section or equipment in poor condition, becomes immediately apparent.

Thus, motorman efficiency, locomotive efficiency and the general efficiency of the entire haulage system are at once collectively and individually indicated by the data afforded through the use of these various meters.

Similarly, watt-hour meters on light and power circuits in and around the coal mines can be made to yield substantial dividends on a moderate investment. There are, of course, various types of such meters respectively adapted to the different conditions encountered. The manufacturers are in a position to effectively co-operate with mine operators and engineers interested in such installations.

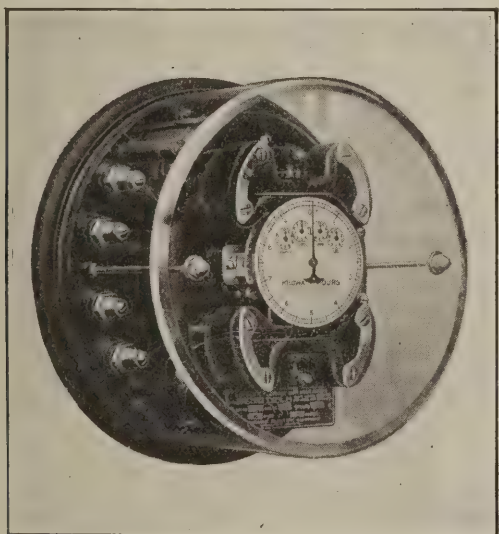


Fig. 4—Alternating-Current Watt-hour Meter

This is a polyphase instrument intended for mounting on a switchboard. It may be used to measure either the output of a plant of the input to any particular line. Actual costs of any process of mining must remain unknown until definite records can be had of the power consumed in that particular process.

## The Miner's Torch

### When the Big Boss Goes a Visiting

THE president of a large coal mining company gave me an invitation today to accompany him on an inspection trip covering all of his mining camps and I declined with thanks. Whenever I get invitations of that kind I recall the heart aches and the disappointments brought to me and mine back in the days when I was a mining superintendent and our president, or general manager, and his friends honored our camp with such a visit. Me and mine includes not only my men but my wife and children as well.

The first ordeal of that kind that I recall came early in my married life. We had received notice from the general office that our president and some of our directors would honor us with their presence on a certain day about two weeks later. That night I broke the news to my wife and from that moment she was the busiest person in the camp.

We had a pretty fair house, as mining-camp houses go, but my wife had never been in mining camps previous to our marriage and she knew that our house and its furnishings would not reflect credit on her when inspected by the average city folk. Furthermore, our daily menu, dependent as it was on commissary variety, would hardly cause visitors from a city to wax enthusiastic about our eating; my wife reasoned that her only chance to make an impression was through her housekeeping or her cooking, so our commissary manager had to make several special trips to town for provisions before he satisfied my wife. Of course, it was useless for me to argue that she was taking the thing altogether too seriously; she had found out that I was moving heaven and earth to have the general appearance of the camp improved, and had instructed every mechanic on the job to get busy cleaning machinery.

I have had charge of quite a number of different operations in my day but I have never succeeded in getting one more nearly ship-shape than was that plant when the day for inspection arrived. And what was the reward?

While the crowd was standing at the slope mouth waiting for a trip of cars to come to daylight, a perfectly good wooden roller decided to stop turning and before the trip reached the outside the rope had worn a groove in the roller and yanked it out. Not one of the party noticed the rope or the roller until the roller was lying outside of the track and the rope was sawing grooves in the wooden ties and striking fire on the ballast. I am sure that that one little missing roller made more of an impression than anything that the visitors saw while inspecting the plant.

And what about the wife? The visitors came out in a private car and preferred to have their own chef serve lunch because, as one of them expressed it, a change of food and especially water is always risky. Not one of the visitors met my wife nor suggested that she come over to the car for the noon luncheon they had while the car was on our camp siding. Perhaps they didn't know I had a wife.



# Competition of Oil with Coal for Fuel Purposes Begins to Lose Its Edge

Increasing Price Taking Away Principal Advantage—Uncertainty of Supply Menaces Future of the Industry—High Operating Efficiency and Absence of Ashes Counterbalanced by Wear and Tear on Boilers

**O**IL IS losing the advantage in price it once had in competition with coal and its supply is by no means as sure as that of coal in this country. For these reasons Borden Covell, president of the Northern Coal Co., of Boston, sees a weakening of oil as a competitor of coal in New England and elsewhere. He reviewed the matter before the American Wholesale Coal Association convention in June.

Six or seven years ago, he said, oil came in strong against coal, mainly because oil salesmen could convince buyers of heating equipment that oil would cost them 10 per cent less than coal and that they could save the entire cost of their oil-burning equipment during the life of their very first oil contract. In the thickly settled and manufacturing districts there is enough labor trouble to make coal firing often troublesome. This, too, helped the oil man. The high coal prices of 1920 made the oil buyer feel justified in the belief that he had done the right thing when he shifted to oil. But conditions have changed. The coal man has the advantage today.

Owners of plants who think of changing from coal to oil today should make haste very slowly, in Mr. Covell's opinion. Even if the price of oil is as low as coal now, what will it be on the next contract? And how long will plenty of oil of the right quality be available?

## OILS OF MANY SPECIFIC GRAVITIES RECEIVED

"Approximately 725 billion barrels of fuel oil," said Mr. Covell, "are produced annually. Mexico contributes 25 per cent of this. Crude oil as produced in Mexico carries too low a flash point to permit its use generally. Therefore the oil is topped—that is, a small percentage of gasoline and other light oils is distilled to save the oil and produce a fuel which will flash at not less than 150 deg. This residue runs 14 to 16 deg. Baumé and will average 18,400 B.t.u. per pound. It is well to add right here that whereas in the early stages of the game oil ran uniformly, it is now quite the opposite. There are so many grades of oil coming into the market that a plant now using oil for fuel must figure on receiving oil of different specific gravities, just the same as it received different grades of coal.

"In order to give some figures on cost, we will assume as a standard coal showing 14,250 B.t.u. as received. Fuel oil is sold by the barrel. To reduce that fuel to weight, let us figure 18,400 B.t.u. per pound, 8 lb. to the gallon, 42 gal. to the barrel. These figures give 31,920,000 B.t.u. per gross ton of coal, and 6,180,000 B.t.u. per barrel of fuel oil. One gross ton of bituminous coal will be equal to 5.17 bbl. of oil on a heating-value basis, *regardless of efficiency*. In some sections steam sizes of anthracite coal are sold in competition with bituminous coal. Therefore, figuring 11,500 B.t.u. per pound for this class of fuel gives us 25,760,000

B.t.u. per gross ton, or equal to 4.17 bbl. of oil on a heating-value basis, regardless of efficiency.

"The percentage of efficiency is of paramount importance. Comparing oil as against the various types of coal, we find:

	Operating Efficiency	Barrels of Oil Equivalent to Tons of Coal
Hand firing.....	63%	4.23
Stoker firing.....	75%	4.96
Pulverized coal.....	80%	5.36
Steam sized anthracite.....	68%	3.68

"Cost of changing over from coal to oil is important. Hand-fired plants usually are small and therefore not attractive to the oil man. Stoker plants, depending on how elaborate, cost from \$16 to \$25 per horsepower. The cost of installing oil as a fuel depends largely on the size of storage required, ease of installation—regulations are very strict on this—resetting of old boilers, or the installation of new ones. Conditions vary, so that the cost runs from \$15 to \$40 per horsepower.

## EAST USES MEXICAN OIL, SOUTH-WEST AMERICAN

"The oil used for steam production in the East is essentially Mexican oil, while that used in St. Louis, Chicago and the Southwest is what might be called American fuel oil. The Mexican is a good deal heavier and conditions of feeding it into furnaces are quite different from those when American fuel oil is used. For instance, some years ago a large plant in Rhode Island ran short of its regular fuel oil and the contractors shipped to it quite a bit of American fuel oil. The plant's apparatus was lined up to use the heavy oil with a steam pressure for putting it into the furnaces considerably higher than is necessary in using the lighter oils. Therefore the waste sustained was considerable.

"The first contract made on fuel oil in New England was in the autumn of 1915 on the basis of 85c. a barrel f.o.b. cars tidewater point New England, for a term of five years. Assuming 4½ barrels of oil per ton of high-grade coal, this was equal to coal at \$3.61 f.o.b. cars shipping point.

## NOWADAYS MUST PAY MARKET PRICE FOR OIL

"When fuel oil was first introduced, contracts could be made at a fixed price for a term of years; today it is customary to base the price on the price of bunker oil f.o.b. New York as quoted daily in the New York *Journal of Commerce*. Today the price quoted is \$1.75 per barrel. Prices in Providence, Boston and Portland are 10c. a barrel higher. Therefore, if you order today, say, 10,000 bbl. of oil, the price is based on the quotation that you read in the New York *Journal of Commerce* as of that day, plus the differential charged at the various distributing points in New England, or say \$1.85 Boston. Using 4½ bbl. as equivalent to a ton of coal, this means coal at \$7.86 f.o.b. Boston. We are



asking \$5.75 f.o.b. cars Boston for high-grade West Virginia smokeless coal, or a difference of \$2.11 a ton in favor of coal.

"I have a few comparative costs of the typical New England mill burning around 10,000 tons of coal a year. An engineer went into this plant, studied the conditions as he found them, and reported to the owners that coal and oil bore the following relation in cost: Coal at \$6 per ton equals oil at \$1.58 per barrel; coal at \$7 equals oil at \$1.80; coal at \$8 equals oil at \$2.02; coal at \$9 equals oil at \$2.24; coal at \$10 equals oil at \$2.47.

"We will assume for comparison that coal today would cost this plant \$7 in its bins; therefore, it would have to buy oil at \$1.80 per barrel delivered, whereas the cost today is \$1.85 f.o.b. Boston and there is a freight rate of 25c. a barrel. In other words it could pay between \$8 and \$9 for coal and be on an equal footing with oil.

#### NOW COAL IS 30 PER CENT CHEAPER THAN OIL

"In the last five years it would seem as if there was less spread between the contract and spot prices of oil than of coal; so in this comparison oil is favored. However, during that time there were two periods when coal was difficult to obtain and consequently prices were high. On the other hand, there were two periods of overproduction in oil and prices consequently fell. A comparison of figures shows fuel oil today at \$1.75, New York Harbor, and high-grade coal at \$5.25@5.50 per gross ton at the piers, with, I fear, a tendency downward. On the basis of 4½ bbl. of oil to a ton of coal, we find oil costing \$7.43. This means coal is approximately 30 per cent cheaper than oil.

"In a manufacturing plant the value of fuel as it is delivered is not so important as the cost per 1,000 lb. of steam leaving the boiler room. Each plant has its own particular conditions and therefore study is required before proper decision can be made. It behooves the concern studying its present costs with coal as fuel against those submitted by engineers for the oil people to see first if he cannot improve the conditions under which he is burning coal without going into any heavy expenditure.

"The points usually stressed by the proponents of fuel oil are: That oil has higher efficiency, makes no ashes, is of higher capacity and can be fired with fewer labor charges.

#### OIL NOT ANY MORE EFFICIENT FUEL THAN COAL

"As to the question of efficiency it is a fact that there is little difference between a modern stoker layout and oil-fired furnaces. The error of excess air is more difficult to detect in oil combustion than in coal, thus tending to fuel waste.

"It is true oil makes no ashes, but to offset this is the residue deposited on the heating surfaces of the boiler—a deposit oily, hard to remove and highly non-conductive as to heat. Greater care is necessary in removing this deposit than is needed in blowing off the dust from ashes. In many localities today the demand for ashes, due to construction work, is so great that the cost of handling them is taken care of by those who are willing to buy them; in fact in some plants a little money is made.

"Undoubtedly the capacity is in favor of oil in plants of comparable efficiency, but this excessive forcing has ruined many boilers. The contact of the fuel-oil flame

has often cracked and burned parts of the combustion chambers.

"In hand-fired plants of a size requiring employment of many men, the labor cost is certainly higher in firing coal than in burning oil. However, modern stoker installation under average conditions existing today requires very little in additional labor costs, for under proper conditions mechanical stokers need but one fireman and one water tender for every 5,000-hp. of boilers. It is impossible for a plant equipped with fuel oil to get along with a lesser number. The labor of tending to the water levels in either installation is the same and stokers do not require any more adjustment than do the oil burners.

"We in New England have been particularly hard hit by fuel oil. Conservative estimates place the loss in coal consumption due to replacement by fuel oil at between four and a half and five million tons per year. Today the tide is beginning to flow our way and we expect to see by far the larger portion of our old customers back with us again in the next four or five years.

"The improvements each year in getting higher gasoline yields from oils make the refining process more attractive and consequently lessen the amount of fuel oil available for steam purposes.

#### OIL MAN DOESN'T WANT WINTER DELIVERIES

"Oil heating for homes has increased tremendously throughout the country, due primarily to the usual reasons—cost, scarcity and high prices. The campaign is being made almost entirely by the oil-heater man. He confines his energies to territories near the large storage centers and usually discourages the use of oil where it may be difficult to make deliveries during the winter months. Generally there is no saving in using house oil and in many cases it costs more than coal. It is attractive because there are no ashes and cellars are clean, but there is an objectionable noise and the fire risk is great. Many disastrous fires have occurred during the past winter and some fatal explosions, and we have innumerable instances of soot and oil smells invading the upper stories. We all know of instances where householders have returned to coal, but, generally speaking, this new form of heating houses will increase as better burners are put on the market. I think the use of oil for heating is in its infancy."

#### Paint Protects Concentrating Tables From Acid and Attrition

The highest upkeep item, chargeable to concentrator-table operation in anthracite breakers, is for covers and riffles. The acid water and the abrasive action of the coal tend to shorten the useful life of the covers and of the maple riffles which are nailed to them. It has been found practicable to coat the operating surface of the tables with high-grade resisting paint. In this way the life of the linoleum and wood is profitably prolonged. In the lead and zinc field concrete is being used for the table "cover." It has been used also by the Utah Copper Co., and still may be in use for that purpose. The lead and zinc companies are using rubber riffles, the Utah Copper Co. and Replogle Steel Co., however, pressing iron into that service. The first of these companies is cleaning copper ore and the second iron ore.





## News Of the Industry



### Storage Essential to Solution of Nation's Coal Problem, Says Engineers' Report

**Committee of American Engineering Council Declares It Will Eliminate Danger of Fuel Famine, Stabilize Industry, Relieve Railroads and Ultimately Cut Consumer's Coal Bill**

Storage of coal is essentially necessary as an aid to the solution of the national coal problem, the Storage of Coal Committee of the American Engineering Council declares in its report; will eliminate all danger of coal famine, stabilize industry, relieve the railroads and ultimately cut the consumer's coal bill.

The report of the committee, which was made public on July 7, sets forth that if each coal consumer will adopt the policy of annually purchasing coal on a uniform monthly delivery basis it will automatically result in sufficient seasonal storage to guarantee coal to the consumer as needed and will bring about a uniform demand for coal whereby the coal producer and carrier may establish uniform and standard production and shipment schedules.

#### Cites Hard-Coal Precedent

Confirmation of the practicability of coal storage is afforded by the anthracite industry, says the committee, which is far more stable than the bituminous, because producers, carriers and consumers of hard coal for a number of years have alike encouraged and practiced storage.

"The storage of coal also will remove the evils of intermittent operation of coal mines, frequent panicky market conditions, and coal shortages due to inability of the carriers to meet peak demand," declares the report.

The irregularity in coal production, the report continues, is largely due to seasonal demand. This seasonal demand is responsible for 47 per cent of the idle time of the coal industry. Seasonal demand also contributes to another very disturbing element, namely, the overdevelopment of mine capacity through opening too many mines. The two factors of intermittent or seasonal operation and overdevelopment are in a large measure responsible for the ills of the coal industry.

The report sets forth "a simple and practical remedy," saying that it is the coal consumer who must start the cycle that will bring about a stabilized industry.

"The amount of storage required to produce these corrective and constructive results," the committee declares in summarizing its conclusions, "is small in terms of the per cent of annual con-

sumption. For seasonal storage, from 9 to 10 per cent of the annual consumption is all that is required. If this amount is supplemented by additional reserve storage of no more than 7 per cent, the result will be an accumulation of some 83,000,000 tons of coal in storage by Sept. 30 of each year. The practicability of this amount of storage with but slight additional outlay for equipment is indicated by the fact that on Sept. 1, 1923, there was 56,000,000 tons in storage.

"Equipment has been developed and may be obtained to meet any storage situation or requirement. The cost of such equipment ranges from a few cents per ton of capacity up to \$2.50 or \$3 per ton of capacity.

"All kinds of coal have been and may be successfully stored. The cost of storage per ton, including fixed charges on equipment, maintenance and operation expense and interest on investment in coal as well as taxes and insurance, in most instances does not exceed 75c. per ton yearly. More generally it is around 50c. per ton yearly. This cost is insignificant when distributed over annual consumption.

"To increase transportation facilities to meet the peak demands resulting from the prevailing unsystematic practice in coal shipment would require an additional investment of some \$12,000,000,000. Such an investment is not justified.

#### Railroads Have Most to Gain

"The railroads have more to gain by storing coal than any other class of consumer. In general, storage should take place at the point of use, to accomplish the most in relieving transportation and safeguarding supply. In general, storage at mines is not recommended. Cars should be assigned to mines upon the basis of coal actually sold and not upon rated capacity of production."

While the report refers primarily to industrial consumers of bituminous coal, the householder, the committee says, is in a position to aid with the least cost, because no special equipment for storing and reclaiming is required and his individual investment in coal is relatively small. Householders use approximately 50,000,000 tons of bituminous coal annually, which, if placed in their bins by the end of September

### Nebraska Loses on Its Coal

Governor Charley Bryan, of Nebraska, is among those who regard coal producers as "barons." So last winter he ran a good many coal yards throughout Nebraska, undercutting the dealers. It was more or less of a success until they footed up the bills at the end of the year. Omaha, for instance, is short \$8,000 and the City Council is still wrangling over how to pay the deficit. There are about 900 tons of coal on hand, for which the city cannot get over \$3 a ton, which is less than cost, and this coal is estimated by city authorities to have depreciated about 50 per cent in value by long storage. So Governor Charley Bryan may not be so sure about coal baronism now.

of each year, would materially contribute to the solution of the coal problem.

"Federal, state, city and other civic divisions of the body politic are not meeting their responsibility in relation to the seasonal storage of coal," the committee states. "They are as derelict in regard to seasonal storage as are other users, and frequently add to a confused situation by obtaining priority orders. Public officials should take the lead, by precept and by example, in furthering the storage of coal.

"The evil practice of indiscriminate breaking of coal contracts has seriously injured the American coal industry with reference alike to production, transportation and consumption. Contracts for coal should be observed with the same good faith as universally prevails in regard to other forms of commercial contracts."

The personnel of the committee which made the investigation follows:

W. L. Abbott, chief operating engineer of the Commonwealth Edison Co. of Chicago, chairman; H. Foster Bain, Director of the Bureau of Mines, Washington; William Hutton Blauvelt, consulting engineer, New York City; W. H. Hoyt, chief engineer of Duluth, Missabe & Northern Ry., Duluth, Minn.; William J. Jenkins, vice-president and general manager of the Consolidated Coal Co. of St. Louis; David Moffat Myers, consulting engineer, New York City; Prof. S. W. Parr, University of Illinois, Urbana; Dean Perley F. Walker, University of Kansas, Lawrence; Roy V. Wright, managing editor of *Railway Age*, New York; Edgar S. Nethercut, secretary of the Western Society of Engineers, Chicago, and O. P. Hood, U. S. Bureau of Mines, Washington.



Accidents at Coal Mines  
During May Resulted in  
Loss of 131 Miners' Lives

Accidents at coal mines in the United States during May, 1924, killed 131 men, according to information received from state mine inspectors by the Bureau of Mines. The production of coal during the month was 38,981,000 tons; thus the fatality rate was 3.36 per million tons. This compares with a rate of 6.44 in the preceding month, 3.40 for May, 1923, and an average rate of 3.68 for May during the ten years 1914 to 1923. For bituminous mines alone the fatality rate for May, 1924, was 3.04 per million tons, as compared 2.89 for May last year and a ten-year average rate of 3.25. For anthracite mines alone the rate was 4.65 per million tons, as against 6.18 for May, 1923, and a ten-year average rate of 5.84.

Accident records for the first five months of 1924 show 1,132 lives lost, representing a fatality rate of 4.81 per million tons of coal produced. For the same period last year the death rate was 3.94. The five-month fatality rate for bituminous mines alone was 4.73 in 1924 and 3.65 in 1923; for anthracite mines alone it was 5.21 in 1924 as compared with 5.53 in 1923.

Explosions of gas or coal-dust are the only class of accidents showing increased fatality rates in 1924 as compared with 1923. All the other main causes—falls of roof and coal, haulage, explosives and electricity—show reduced rates.

Accident-Prevention Work  
Spreads in Pennsylvania

Accident-prevention meetings conducted by the State Department of Mines in the anthracite districts of Pennsylvania have been so successful, Secretary of Mines Joseph J. Walsh said in a recent statement, that similar meetings will be conducted in the bituminous region. The bituminous inspectors have been instructed to take up the question of holding safety meetings with the operators. It is proposed that a series of meetings be held in every section of the bituminous territory.

"The gathering of the superintendents, mine foremen and firebosses in the various anthracite sections has had an excellent effect," Secretary Walsh said. "There was real co-operation and the men entered into the safety discussions with unusual interest.

"In the bituminous region, the stone dusting of mines to prevent explosions of coal dust is receiving a great deal of attention. The experiments conducted thus far have proved the effectiveness of this method of accident prevention and I expect that the operators generally will avail themselves of this means of lessening mine hazards. This method and others will be discussed at meetings in the bituminous region."

New River Co. Asks Rehearing  
Of Joint Mine Case

The New River Co., of West Virginia, has filed a petition with the U. S. Supreme Court asking a rehearing of the joint mine case which was decided by that tribunal June 9. The petition will not come before the court for action until October.

In the joint mine case, the Supreme Court, with Justice McKenna dissenting, upheld the constitutionality of rule 4 of the car service circulars of the Interstate Commerce Commission, in which the commission set down the policy that in periods of car shortage a mine located on more than one railroad should not receive a total allotment of cars in excess of its gross rating. This rule placed joint mines on the same basis as local mines.

In its petition for rehearing, the New River Co. asserts that, owing to the fact the case was advanced for argument, there was not sufficient time for adequate preparation on the part of the coal companies operating joint mines. Attention is called to the fact that rule 4 affects shippers of all goods who are served by more than one carrier if its application is carried to a logical conclusion. It is furthermore contended that the court paid more attention to the question of jurisdiction involved in this case than to the property rights which it is insisted were involved, or to the obligations of the carriers to provide adequate transportation. As another point the petition contends that under rule 4 joint mines are actually placed at a disadvantage in comparison with local mines.

Coal-Mine Fatalities During May, 1924, by Causes and States

(Compiled by Bureau of Mines and Published by Coal Age)

State	Underground											Shaft				Surface					Total by States						
	Falls of roof (coal, rock, etc.).	Falls of face or pillar coal.	Mine cars and locomotives.	Gas explosions and burning gas.	Coal-dust explosions (including gas and dust combined).	Explosives.	Suffocation from mine gases.	Electricity.	Animals.	Mining machines.	Mine fires (burned, suffocated, etc.).	Other causes.	Total.	Falling down shafts or slopes.	Objects falling down shafts or slopes.	Cage, skip, or bucket.	Other causes.	Total.	Mine cars and mine locomotives.	Electricity.	Machinery.	Boiler explosions or bursting steam pipes.	Railway cars and locomotives.	Other causes.	Total.	1924	1923
Alabama	3		1										5												1	6	3
Alaska																										0	0
Arkansas																										0	0
Colorado	2												3												1	4	12
Illinois	1												3												1	3	15
Indiana													1													1	2
Iowa	1												1													1	0
Kansas	1												1													1	1
Kentucky	9	1	4										16									1			1	17	6
Maryland																										0	0
Michigan																										1	0
Missouri																										0	0
Montana																										0	0
New Mexico	1												2													2	4
North Dakota																										0	0
Ohio	5		2										9												1	10	1
Oklahoma																										0	0
Pennsylvania (bituminous)	9	1	2										13													13	34
South Dakota																										0	0
Tennessee	3		2										7													7	1
Texas																										0	0
Utah																										0	1
Virginia	2		1										3													3	1
Washington																										0	2
West Virginia	11		9										23							1				2	3	26	31
Wyoming																										0	2
Total (bituminous)	48	2	25	2				10	1				88						1	1			1	4	7	95	133
Pennsylvania (anthracite)	12	7	4				4					6	33										2	3	36	53	
Total, May, 1924	60	9	29	2		4		10	1			6	121					3	3	2	1		1	6	10	131	
Total, May, 1923	89	8	72	14		12	1	10	1	2		10	174	3				3	3	2			1	3	9		186



## Jones Preaches Safety By Using Rock Dust at Rocky Mountain Mines

John E. Jones, rock-dust expert, has spent a month traveling the highways and byways of the Rocky Mountain coal mining region preaching safety by dusting. His tour was arranged by the Bureau of Mines. Mr. Jones was borrowed by the Bureau from the Old Ben Coal Corporation, of Illinois. He had as traveling companions most of the time C. L. Duer, district supervisor of the Bureau's leasing division, and H. I. Smith, mining supervisor for the same division.

During late May, Jones, Smith and Duer spent several days at the Stag Canyon mines of the Phelps-Dodge Corporation, at Dawson, N. M., and on June 3, 4 and 5 they met R. L. Hair, division engineer, and Robert McAllister, mine inspector for the Colorado Fuel & Iron Co., and with them, visited the Morley, Sopris, Primero, Frederick, Berwind, Tabasco and Toller mines of that company. On the evening of June 4 Mr. Jones talked before the superintendents' and foremen's club of the Colorado Fuel & Iron Co. at Trinidad, Colo.

On June 5 the party visited the Bon Carbo mine of the American Smelting & Refining Co. and in the afternoon made a trip to the Lodge of the Whispering Pines near Stonewall, Colo. On June 6 and 7 Jones, Smith and Duer visited some of the Victor-American Fuel Co.'s and the National Fuel Co.'s mines. On the night of June 6 Mr. Jones spoke at a safety meeting in Walsenburg, Colo. Thus ran his "triumphal tour" so far as it covered the southern and central parts of the territory he visited.



Here We Have Jones and His Party at "Lodge of the Whispering Pines"

The party had visited the Bon Carbo coal mine of the American Smelting & Refining Co. that forenoon and were entertained at the Lodge. Those in the picture, left to right, are: C. L. Duer, district supervisor, leasing department, Bureau of Mines; Robert McAllister, mine inspector, C. F. & I. Co.; H. H. Bubb, general superintendent, American Smelting & Refining Co., Cokedale, Colo.; W. M. Laurie, deputy state coal mine inspector; Mr. Garrett, superintendent American Smelting & Refining Co., Bon Carbo, Colo.; R. L. Hair, division engineer, C. F. & I. Co.; H. I. Smith, mining supervisor, Bureau of Mines, leasing department; John E. Jones, safety engineer, Old Ben Coal Corporation, West Frankfort, Ill. The gentleman in the six-gallon hat must remain unknown. He probably was there merely to furnish atmosphere.

## Creating New Industries to Make Jobs for Miners

Indiana has sat around and done nothing for its jobless miners about as long as it can stand it. The state conservation department has a scheme and the first effort to try it out is being made now in and around Clinton. The department is making geologic and industrial surveys of the region to point out to capital the local resources which might be developed in order to create new industries in which the jobless and suffering union miners nearby can find work. The Clinton territory contains shales, sands, clays, gravels and ferruginous materials that might profitably be produced and used for the manufacture of concrete, road building and ceramic materials and other products. Dr. W. N. Logan, state geologist, is working on the matter.

## Merger Movement Appears in Pennsylvania

The Hillman Coal & Coke Co. of Pittsburgh, Pa., has acquired and merged with that corporation five other companies directly connected with the operating end of the coal industry. The merged company will operate under the name of the Hillman Coal & Coke Co. and will have a capitalization of \$8,752,000.

The companies taken in by the parent corporation are the Diamond Coal & Coke Co., the Merchants Coal Corporation, the Jenner Quemahoning Coal Co., the Pittsburgh & Baltimore Coal Co., and the Naomi Coal Co.

## Say C. & O. Imperils Rail Brotherhood Mine Road

The Brotherhood of Locomotive Engineers' investment in coal and rail properties in West Virginia, representing approximately \$3,000,000, faces ultimate failure if the Interstate Commerce Commission denies the application of the Coal River & Eastern Ry. for an order authorizing the company to operate in interstate commerce between coal mines owned by brotherhood members and the Chesapeake & Ohio R.R., according to representations to the commission by the Coal River & Eastern in support of its application.

The Chesapeake & Ohio is making a vigorous fight against approval of the application, contending that the lines controlled by the brotherhood members between their coal mines and the C. & O. are nothing more than spur tracks and therefore not admissible as a part of the interstate transportation system. The Chesapeake & Ohio also charges that the proposed capitalization of \$1,500,000 of the Coal River & Eastern is grossly excessive. It says the capitalization has as a basis \$750,000 as the value of surface right-of-way land worth but a few thousand dollars at most.

The tracks in issue connect the mines of the Coal River Collieries, a brotherhood company, in Boone County, W. Va., with the Chesapeake & Ohio. They are now owned and operated as a private railroad by the Coal River Collieries. The Coal River & Eastern was organized to take over the lines and operate as a common carrier in interstate commerce.

The Coal River & Eastern has authorized the issuance of \$500,000 of bonds and \$1,000,000 of common stock. It is proposed to deliver the bonds and \$250,000 of the stock to the Coal River Collieries for the railroad. The Brotherhood Investment Co., another engineer brotherhood organization, will offer \$750,000 of the stock to individual investors.

The charge is made by the Coal River & Eastern that the "real basis of the protest by the Chesapeake & Ohio is the pursuance of the policy which it has persisted in from the beginning of resisting the application of its group rates to independent short lines."

The Chesapeake & Ohio, however, says the Coal River & Eastern has admitted that the sole purpose of organizing the railroad company was to compel the Chesapeake & Ohio to extend its Kanawha district coal rate to the brotherhood mines and to compel the Chesapeake & Ohio to divide with the Coal River & Eastern its Kanawha district coal rate. It further says it refused to operate over the tracks in issue because they were unsafe for such operation.

Approval of the application, the C. & O. contends, would have the effect of transferring from the Collieries company to the C. & O. not only the expense of moving empty and loaded cars between the brotherhood mines and the connections with the C. & O. but also the burden of investment of the Collieries company in necessary railroad facilities connecting the C. & O. with the mines.



## Sop to Radicals of Northwest Seen in Democratic Anthracite Plank

Adoption Due to Pressure from New England—Non-Partisan Element Provides Loophole Against Hampering Private Enterprise—Selfish Interests Could Keep Regulatory Legislation Before Congress

By PAUL WOOTON  
Washington Correspondent of *Coal Age*

Pressure brought by New England members of the resolutions committee of the Democratic National Convention resulted in the adoption of this plank in the party's platform:

"We pledge the Democratic party to regulate by governmental agencies the anthracite coal industry and all other corporations controlling the necessities of life where public welfare has been subordinated to private interests."

While the loophole provided by the concluding phrase is large enough for a sound administration to make use of without being open to the charge of violating a platform pledge, this declaration paves the way for the radicals and the selfish to bring in and keep before Congress coal-regulation proposals.

New England has been more outspoken than any other section in regard to the desirability of keeping the government out of business and of preserving private initiative in business. Were the consumers of dry goods to propose regulation of the textile industry because there is an indefensible spread between the cost

of cotton and its manufactures New England would be ready to leave the Union. The sentiment in New England, which is typified by the Democratic plank, is not partisan. Republican members of Congress from those states have been active in forwarding the regulation idea in so far as anthracite is concerned. In this they have had the support of the radicals from the Northwest, who in addition to being radical also have had trouble in recent years in obtaining coal at prices which they regard as reasonable.

While the sessions of the Democratic resolutions committee, which framed the platform, were executive, it is understood that this plank provoked little comment. The committee was so torn by its differences over the Ku Klux Klan and the League of Nations planks that it had little time to give consideration to a "minor" matter such as regulating the coal industry.

There was no opportunity for the convention itself to pass upon the respective merits of the different planks. Separate votes were had only on the two controverted planks mentioned.

### More Connellsville Plants Return to 1917 Scale

Following the lead taken a few weeks ago by most of the other independent companies in the Connellsville (Pa.) coke region, W. J. Rainey, Inc., the Republic Iron & Steel Co. and the Crucible Fuel Co. reduced wages on July 1 to the Nov. 10, 1917, scale. As the Rainey company had been working full time up to the time of the reduction, some of the men decided they would not stand for the reduction, and did not go to work July 1. None of the men at the Royal and Allison plants went to work, so these plants were promptly closed down by the company for an indefinite period. At the Mt. Braddock plant about half of the men continued at work and this plant is continuing to operate. The Revere, Paul and Elm Grove plants continued operating in full.

The Republic Iron & Steel Co. has only two mines in operation in the region, Bowood and Martin, and these continued without interruption. The Crucible Fuel Co. plant, which had been idle for several weeks, resumed with a full force.

The only companies in the region now that have not gone back to the November, 1917, scale are the H. C. Frick Coke Co., subsidiary of the United States Steel Corporation, and the Monessen Coal & Coke Co., subsidiary of the Pittsburgh Steel Co. The Frick company has resumed operations at the Bridgeport mine and increased working time at the Colonial plants, but has closed Leisenring No. 3 mine.

### Ohio Miners Conciliatory on Wage Concessions

A two-day joint meeting of operators and miners in the southern Ohio field was held at Logan beginning July 1. The conference was called upon the invitation of miners in an effort to arrive at an agreement relative to concessions to be made on the wage scale in order to permit mines in that field to open in competition with other fields. Practically all of the larger operators were represented.

A conciliatory mood was shown by the miners as a rule and many propositions to reduce the cost of dead work and to reduce expenses generally were made. A joint scale committee was then named to canvass the situation and report back at a future meeting. Operators on the scale committee are James H. Pritchard, commissioner for the Southern Ohio Coal Exchange; F. S. Knox, Jr., New Pittsburgh Coal Co.; G. J. Jones, Ohio Collieries Co.; T. R. Biddle, Biddle Coal Co.; O. S. Newton, Sunday Creek Coal Co.; P. C. Morris, New York Coal Co.; R. T. West, N. D. Monsarrat, Monsarrat Bros., and H. Charleton.

### Last Kanawha Operators Retire from Union Fold And Announce New Scale

Despite persistent efforts of the owners of union mines in the Kanawha district of West Virginia to reach an amicable agreement with District No. 17, United Mine Workers, the last union operators in southern West Virginia left the fold Monday, July 7, according to an announcement by Duncan C. Kennedy, secretary of the Kanawha Operators' Association. Mr. Kennedy stated that every suggestion made by the producers was vetoed by the union's representatives, who frankly stated that it must be the Jacksonville agreement or nothing.

"To continue the 1923 wage scale in this district would mean to keep all the union men in it out of employment, as we could not operate the mines," said Mr. Kennedy. "The scale that we have offered is absolutely the best that we can do. The tonnage rates are the same as those in the 1917 scale, while the day wages are higher."

The new scale follows:

GAS SEAMS	
Pick mining.....	\$0.70½
Pick mining, Powellton Seam.....	.67½
Yardage in pick entries.....	1.24½
Machine loading in rooms.....	.44
Machine loading in entries.....	.49
Machine cutting in rooms and entries.....	.10
Machine cutting, turret and arewall.....	.06
NO. 5 SEAM	
Pick mining.....	.12½
Yardage and pick entries.....	1.37
Machine loading in rooms.....	.45
Machine loading in entries.....	.49½
Cutting rooms.....	.10½
Cutting entries and room necks.....	.11½
Machine cutting, turret and arewall.....	.06½
COALBURG SEAM	
Pick mining.....	.78
Yardage, pick entries.....	1.55
Machine loading, rooms.....	.50½
Machine loading, entries and room neck.....	.55
Machine cutting, rooms.....	.11
Machine cutting, entries and room neck.....	.12½
Machine cutting, turret and arewall.....	.07
RAYMOND CITY SEAM	
Pick mining over 1 in. screen per 100 bushels.....	\$4.16
Yardage in entries.....	1.55
Pick pillar coal, retreating, gas seam.....	.61½
Splint seam.....	.67½

No yardage to be paid in airways, following entries or breakthroughs, where the width exceeds 15 ft.

### GRADUATED SCALE FOR GAS AND SPLINT SEAMS

	Gas	Splint
Machine loading		
4 ft. and over.....	\$0.43	\$0.44
3 ft. 9 in. to 4 ft.....	.44½	.45½
3 ft. 6 in. to 3 ft. 9 in.....	.46½	.47½
3 ft. 3 in. to 3 ft. 6 in.....	.48½	.49½
3 ft. to 3 ft. 3 in.....	.50	.51

Machine cutting below 4 ft. shall be increased ½¢ per ton for each 3 in., in accordance with graduated scale. Graduated scale applies to all seams except those based on Coalburg.

### INSIDE DAY WAGE SCALE

	Hour Rate	Day Rate
Drivers, 1 mule.....	\$0.59½	\$4.76
Drivers, 2 mules.....	.61½	4.92
Tracklayers.....	.61	4.88
Tracklayers, helpers.....	.57	4.56
Slate shooters.....	.58	4.64
Greasers.....	.32	2.56
Trappers.....	.32	2.56
Spraggers and couplers.....	.33	2.80
Old men trappers.....	.43	3.44
Motor and machine runners.....	.62½	5.00
All other inside day labor.....	.56½	4.52

### July Circular Prices for Anthracite

	Broken	Egg	Stove	Nut	Pea	Buck No. 1	Rice	Barley
Philadelphia & Reading.....	\$8.95	\$8.95	\$9.10	\$8.95	\$6.00	\$3.00	\$2.25	\$1.50
Erie.....	8.70	8.70	8.80	8.60	5.50	3.00	2.00	1.50
Hudson Coal Co.....	8.80	8.80	8.80	Range	8.80	3.15	Boiler	1.60
Lehigh Valley.....	8.50	8.75	8.95	8.95	5.75	3.00	2.00	1.50
Lehigh & Wilkes-Barre Coal Co.....	8.00	8.55	8.55	8.55	5.75	3.00	2.00	1.50
Lackawanna.....	8.00	8.55	8.55	8.55	5.85	3.00	2.00	1.50
Lehigh Coal & Nav. Co.....	8.95	8.95	9.20	9.05	6.00	3.00	2.00	1.50



## Fierce Battle Now Rages Over Electric Cap Lamps At Oklahoma Coal Mines

They are still enjoying frontier stuff down in the coal fields of Oklahoma. Once they had the infamous "Molly Maguires." Now they have bolsheviki and "wop lawyers" and "saddle-colored coons" defying John L. Lewis' union and fighting "the battle of the cap lamps" with mass meetings where they threaten to kill somebody and into which hated but intrepid Bureau of Mines men walk unarmed. And all the while the three Hartshorn mines of the Rock Island Coal Mining Co. are tied up tight.

The whole business started almost two years ago, when the Rock Island company introduced electric cap lamps into its No. 12 mine. This move in the interest of safety was disapproved by a section of the district union organization and by State Inspector Edward F. Boyle. However, the company was sold on the idea, as were several other coal producers of the region. So in the settlement made for the Southwestern Interstate district in May, based on the Jacksonville agreement, the operators insisted upon an electric cap lamp provision, which was written into the contract after a long dispute.

In the dispute, Andrew McGarry, district president of the miners, and his district committee refused to accept an arbitration decision by Dave Frampton, an international union representative, in which Frampton recommended that the question go to the joint board for settlement under the contract while the lamps were used in Rock Island mines Nos. 7, 9 and 12 and while the mines went ahead and worked. But McGarry appealed to international union headquarters. By unanimous vote of the international board Frampton's decision was supported. Then the agreement was signed at Kansas City and everybody expected the Rock Island mines to go to work with electric cap lamps when the rest of the state resumed. But it was not so. State Inspector Boyle burst out with an order barring every sort of lamps underground in Oklahoma except carbide lamps.

Inspector Boyle's position is represented to be this: Electric cap lamps are so safe that mining companies using them will neglect their ventilation, to the detriment of Oklahoma miners. Boyle threatened to arrest the entire Rock Island railroad if necessary, and Mine Superintendent Jones in particular, if those cap lamps went below.

Then followed mass meetings of miners. They rallied around McGarry and around their paid lawyers and even around Inspector Boyle.

But it chanced that Frank Feehan, once president of District No. 5 miners' union, Irish by nature and with a fist the size of a ham at the end of each able arm, joined the Bureau of Mines service May 1 as a safety commissioner and was in Oklahoma at the time. Hearing about all this bloodthirstiness on the part of a controlling element of the Oklahoma district, believing in the righteousness of electric cap lamps and being Irish, he strode



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**Richard F. Grant**  
President U. S. Chamber of Commerce

onto the platform at the next miners' outdoor mass meeting in Hartshorn, announcing that the assemblage could look him over. He was one of those hated government men they so yearned to puncture.

There ensued a dialog substantially as follows:

Mr. Feehan: "I'm going to address this meeting. I——"

Mr. Chairman: "You ain't neither. Nobody ast you to——"

Mr. Feehan: "I don't have to be asked. You have been misleading a lot of these miners and keeping them from working and——"

One hundred flivvers: "Whrrrt! Honk! Honk! Whrrrrrt! Whrrrt!"

Mr. Feehan: "Honk your horns off; I'm going to be heard. You men simply don't know what you're doing in this fool fight against electric lamps. I'm here to give you the facts in——"

A kindly voice: "Get ta hell outa here while you're still in one piece."

But finally Feehan said his say. And they do say it was full of straight-arm thrusts and jabs to the wind.

Before the meeting was over there was a different feeling evident toward Feehan and electric cap lamps. A few days later a delegation of miners called on Boyle and asked him to lift his ban on lamps. Their families are hungry and the Rock Island's three mines stand ready to give 900 of them almost steady work.

A wave of sentiment against the controlling union element in Hartshorn appeared to develop. For one thing a viciously worded "Warning" flier was posted all over Hartshorn against the "bolsheviki" and the "saddle-colored coons" and others thought to be responsible for the mine shutdown. For another, a miner met a union lawyer on the street and beat him up with what is known as neatness and dispatch.

But the latest news from the front in "the battle of the electric lamps" is that Inspector Boyle's order still stands and the three Rock Island mines are still down, although nearly 100 company men are daily going in and out of them wearing electric cap lamps without getting arrested.

## R. F. Grant Is New Head of U. S. Chamber of Commerce

Richard F. Grant, of Cleveland, vice-president of the M. A. Hanna Co. and a former president of the Cleveland Chamber of Commerce, was elected president of the Chamber of Commerce of the United States at a meeting of the board of directors, July 1 in Washington. He succeeds Julius H. Barnes, of Duluth, who declined another term. The board also elected Owen D. Young, chairman of the board of the General Electric Co., as a director to take the place of Lewis E. Pierson, chairman of the board of the Irving Bank-Columbia Trust Co., of New York, who was recently elected vice-president for the Eastern District of the National Chamber. John H. Fahey, Boston publisher, who was the second president of the National Chamber and who served several years as a member of the senior council, was elected an honorary vice-president.

In addition to his interests in the M. A. Hanna Co., one of the large producers of coal, iron and steel, Mr. Grant, the new president, has taken an active interest in public affairs. He was born at Owatonna, Minn., in 1879. He obtained his Ph. B. degree at Yale in 1899 and was graduated with a Bachelor of Law degree from the New York Law School in 1901. He took up the practice of law in Duluth in 1901 as a member of the firm of Sullivan & Grant. In 1909 he became general counsel of M. A. Hanna & Co., a partner in the firm in 1917, and in 1923, when its interests were taken over by the M. A. Hanna Co., he became vice-president.

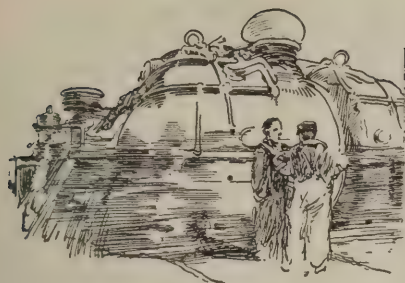
Mr. Grant also is president of the Susquehanna Collieries Co., vice-president of the Hanna Furnace Co., president of the Virginia Ore Mining Co., and a director in the Cleveland Trust Co. and many other business institutions. He was appointed by President Wilson a member of the National War Finance Committee of the American Red Cross and served as chairman of the membership and finance drives for Ohio, Indiana and Kentucky in 1917. He also is a member of the American Bar Association and the American Iron and Steel Institute.

## Carnegie Plant at Clairton Is Now Biggest Coke Producer

With the first output of coke recently at the newly completed units of the byproduct coke ovens at the Carnegie Steel Co.'s works at Clairton, Pa., the plant became the largest in the world. It has a total of 1,134 ovens having an annual carbonizing capacity of 8,085,000 tons of coal and a yield of 6,350,000 tons of coke.

The latest addition, consisting of 366 ovens arranged in six batteries of 61 ovens each and having a carbonizing capacity of 8,500 tons of coal per day, had been under construction nearly two years. It will produce daily 6,000 tons of coke, 55,000,000 cu ft of gas, 90,000 gallons of tar, 215,000 lb. of ammonium sulphate and 25,000 gallons of benzol products.





## Practical Pointers For Electrical And Mechanical Men



### Reasons Why Open-Delta Connected Transformers Often Burn Up

Phase Relations Often Overlooked—Two Open-Delta Connected Transformers Cannot Carry Two-Thirds the Kilowatt Load of Three Fully Loaded Delta-Connected Units

By O. E. KENWORTHY

Electrical Engineer

Lehigh Valley Coal Co., Wilkes-Barre, Pa.

Though many operating companies have their transformers connected in open delta the principles under which the transformers operate, though quite simple, is not clearly understood and needs explaining.

To present this explanation let us consider Fig. 1 which represents schematically a three-phase load connected to the secondaries of three transformers. Both the load and transformers are connected in delta. Let us assume that the load is balanced and that each transformer is delivering the same amount of current.

Also let us represent the value of the transformer secondary currents by  $i$ ; then

$$i_1 = i_2 = i_3 = i$$

The line current we know has a value equal to 1.73 times the transformer secondary current. Representing the value of the line current by  $I$  we have

$$I_1 = I_2 = I_3 = I, \text{ and } I = \sqrt{3} \times i$$

The power delivered by each transformer can be indicated by the letter  $P$ . Hence

$$P_1 = P_2 = P_3 = P$$

Now if  $E$  is the voltage at the secondary terminals of each transformer.

Then  $P = Ei \cos \theta$  where  $\cos \theta$  is the power factor of the transformer secondary.

The total power  $P_t$  delivered by the three transformers is

$$P_t = 3 Ei \cos \theta$$

Substituting for  $i$  in this equation its value expressed in terms of line current we have when  $i = \frac{I}{1.73}$

$$P_t = 3 E \times \frac{I}{1.73} \cos \theta \\ = \sqrt{3} EI \cos \theta$$

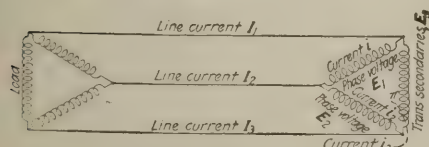


Fig. 1—Usual Delta Connection

This illustration represents the current and voltage values when the load is balanced and three single-phase transformers are delta connected.

Fig. 2 shows the relation of the voltages and current. Fig. 3 is a schematic diagram of the load in Fig. 1 connected to the same bank of transformers but with one of the three transformers cut out of service, or in other words connected open-delta. Assuming that the load has not changed we will have the same values of line current as before, i.e.,

$$I_1 = I_2 = I_3 = I$$

However, the value of the transformer secondary current is now equal to the line current, but it lags behind the secondary voltage by an angle which is 30 deg. greater than before. Instead of the power factor of the secondaries being the cosine of  $\theta$  degrees it is now  $\cos \times (\theta + 30 \text{ deg.})$ .

The total power delivered by the two transformers is now

$$P_t = 2 EI \cos (\theta + 30 \text{ deg.})$$

For simplicity let us consider  $\theta = 0 \text{ deg.}$ ; then

$$P_t = 2 EI \cos 30 \text{ deg.} = 2 E \times \sqrt{3} i \times \cos 30 \text{ deg.}$$

By proportion we have.

$$\frac{P_t \text{ (1st case)}}{P_t \text{ (2nd case)}} = \frac{3 Ei \cos \theta}{2 \sqrt{3} Ei \cos (\theta + 30 \text{ deg.})}$$

but since  $\theta = 0 \text{ deg.}$

$$\frac{P_t \text{ first case}}{P_t \text{ (second case)}} = \frac{3}{2 \sqrt{3} \times 0.866} \\ = \frac{3}{3} = 1$$

which is true because we assumed the load to be the same in both cases. However, the following is also true: The power in one transformer in the second case was

$$E \sqrt{3} i \cos (\theta + 30 \text{ deg.})$$

and the power in one transformer in the first case was  $Ei \cos \theta$

Assuming again that  $\theta = 0 \text{ deg.}$

$$\frac{E \sqrt{3} i \times 0.866}{Ei} = 1.5$$

or each transformer in the second case is delivering 50 per cent more power than each transformer in the first case. The kilowatt capacity of each transformer is now exceeded by 50 per cent. Again, the kilovolt-ampere of each transformer in the second case is

$E \sqrt{3} i$ ; whereas in the first case it is  $Ei$ .

$$\text{Therefore } \frac{E \sqrt{3} i}{Ei} = \frac{1.73}{1}$$

or the kilovolt-ampere capacity of each transformer in the second case is exceeded 73 per cent. This fact is vitally important as will be recognized when it is recalled that transformers are rated on their kilovolt-ampere capacity. By inverting the last equation we get the decimal 0.577. We can say then that the kilovolt-ampere capacity in the first case is 57.7 per cent of the kilovolt-ampere capacity of each transformer in the second case.

Let us further consider a third condition using Fig. 3 again. We will now reduce the load to the point where the value of current in each transformer is equal to the current values in the first case, but at the same time keep it balanced. This means that now we have made the kilovolt-ampere capacity of each transformer in this, the third case, equal to the kilovolt-ampere capacity of each transformer in the first case. The line current is now

$$i_1 = i_2 = i_3 = i$$

The current in each leg of the three-phase load is  $\frac{i}{1.73}$ .

The load in the first case was

$$3 Ei \cos \theta$$

but is now  $3 Ei \cos \theta \div 1.73$

By proportion again

$$\frac{\text{load (third case)}}{\text{load (first case)}} = \frac{3 E \frac{i}{1.73} \cos \theta}{3 Ei \cos \theta} \\ = \frac{1.73}{3} = 0.577$$

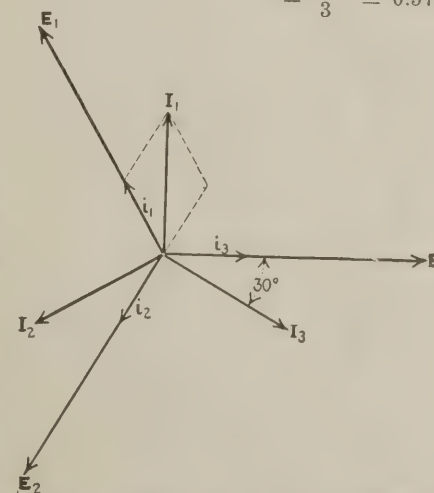


Fig. 2—Vector Relations in Delta-Connected Circuits

Note that the line currents lag behind the corresponding transformer currents 30 deg. The line current is always the vector sum of currents in the two transformers.



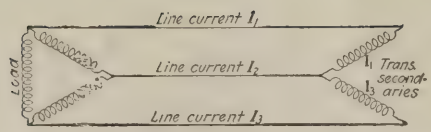


Fig. 3—Open-Delta Current Relations

Here the line current is equal to the transformer current but it lags behind the transformer current 30 deg. more than when the three transformers are delta-connected.

This means that when two transformers are placed in open-delta service they are capable of delivering only 57.7 per cent of the kilowatt capacity that the three transformers delivered in the first case if they are to be kept within their kilovolt-ampere capacities. Going still farther, in the first case the kilowatt capacity of each transformer secondary was

$$Ei \cos \theta$$

whereas in the third case the kilowatt capacity is  $Ei \cos (\theta + 30 \text{ deg.})$ . Assuming  $\theta = 0 \text{ deg.}$

$$\frac{Kw_1}{Kw_3} = \frac{Ei}{Ei \times 0.866} = \frac{1}{0.866}$$

or the kilowatt capacity of each transformer in an open-delta bank is only 86.6 per cent of what it is in a closed-delta bank of transformers.

We can again prove the statement that two transformers working in open-delta can produce only 57.7 per

cent of the capacity of other transformers working in a closed-delta circuit by the following:

$kW_1 = \text{kw. of each transformer connected in a closed-delta}$

$kW_3 = \text{kw.} \times 0.866 = \text{kw. of each transformer connected in an open-delta}$

$3 \text{ } kW_3 = \text{total output of the transformers connected in a closed delta}$

$2 \text{ } kW_3 = 2 \text{ kw.} \times 0.866 = \text{total output of two transformers connected in a closed-delta.}$

$$\frac{2 \text{ } kW_3}{3 \text{ } kW_1} = \frac{2 \text{ } kW_1 \times 0.866}{3 \text{ } kW_1} = \frac{1.73}{3} = 0.577 \text{ or } 57.7 \text{ per cent.}$$

There are a few other facts in relation to the open-delta connection which are worth while mentioning at this time and they are as follows:

The voltages of the three phases on open-delta connections are a trifle unbalanced but for practical operation the lack of balance is really negligible.

In selecting transformers for a given load the open-delta connection requires transformers approximately 15 per cent larger than for the closed-delta, but there are two units instead of three.

In efficiency and weight the closed delta is practically the same as the open delta, but in cost the latter has a slight advantage.

## Selecting the Proper Size Wire For Electric Circuits

In inspecting the electrical equipment of almost any mine many of the feeder circuits will be found to be overloaded, the circuit being required to supply more motors than was originally intended when the feeder was installed.

Whenever a new motor is installed it is connected to the nearest supply line and no further consideration is given to the circuit. Within a short time the feeders are so greatly overloaded that the voltage drop is excessive and the wires become hot.

The safe current-carrying capacity of a single 1/0 rubber-covered wire is about 125 amp. Should this conductor be required to carry 200 amp. it would be overloaded 60 per cent. During the starting period of a motor such a conductor often would carry a much larger current and consequently become hot.

The safe current-carrying capacity of a wire is determined by the current which will pass through it continuously without causing it to become so hot as to damage the insulation or surrounding materials.

We all know that current flowing through a resistance develops heat. The same is true when a current flows through a conductor. The practice of carelessly overloading electrical conductors is more prevalent than generally believed, and the effects upon the conductors are quite serious. If the square of the current flowing through a conductor is multiplied by the circuit resistance, the heat developed, expressed in watts, may be determined. It will be noticed that the heat loss in the conductor varies directly as the square of the current, that is, if the current in any conductor is doubled, the heat is increased four times. Referring to the conductor hav-

ing a normal capacity of 125 amp. but carrying a current of 200 amp. we see that although the current has been increased only 60 per cent, the heat has increased 156 per cent.

This explains why burnouts occur when electrical equipment is overloaded. The excess load may not be very great, but the wires are greatly overheated.

To guard against overloading conductors, the current which is to flow in the line first should be determined, then a suitable conductor should be selected. Whenever the circuit is long, consideration should be given to the voltage drop, as it is possible to select a wire of ample current-carrying capacity but yet too small efficiently to deliver power to the motors connected at the end of the circuit.

The table shows the normal current-carrying capacity of each conductor which in no case should be exceeded, because the starting current required by most mine equipment is from one to four times the normal full-load current.

By following the suggestions given in the table, when installing new feeders, properly functioning circuits will be more common. In laying out new circuits due consideration should be given to future extensions.

### Area and Capacity of Rubber-Covered Wires

Wire Size	Area in Circ. Mil	Capacity in Amp.
14	4,133	12
12	6,555	23
10	10,430	32
8	16,466	39
6	26,304	43
4	41,827	65
3	52,740	76
2	66,407	90
1	83,770	107
1/10	105,738	127
2/0	133,426	150
3/0	167,884	177
4/0	211,876	210

## Gage Checks Wheel Center

The electric locomotive is one of the most important pieces of mining equipment yet it is in many cases more abused than any other piece of apparatus used in the mines.

Accidents caused by locomotives are nearly always attributable to incorrect operation or lack of proper care of the equipment. At best the service demanded from a mine locomotive is very severe. The strains and shocks that must be sustained even when starting an ordinary trip of mine cars are always quite great. When the track conditions are bad or many of the cars are loaded with rock the strains are much worse.

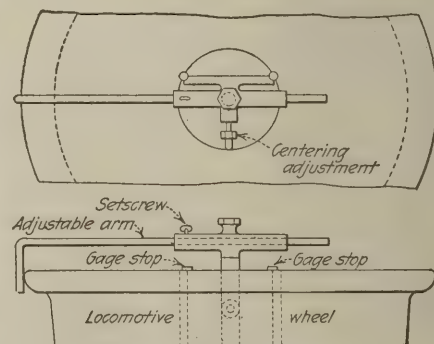
Consequently, if best results are to be obtained, the locomotive should always be kept in good repair. Dangers and damages to the locomotives, cars, track and workmen quickly multiply when the equipment is not properly designed.

One of the best ways to prevent delays and accidents is to repair the locomotives just as soon as conditions warrant. This, however, is not sufficient because a repair should be always as good as the original job.

Rolled-steel wheels are bored after being rolled and the possibility of the bore not being true, although remote, is quite possible. The bore of the wheel should be correctly centered.

Whenever a new locomotive wheel is used at the shops of the Pennsylvania Coal and Coke Corporation, Cresson, Pa., the device shown in the illustration is used to determine whether the bore is in the exact center of the wheel. The tool consists of a block having two parallel edges and an adjusting screw. This part of the device is placed inside the bore and the adjusting screw tightened to properly center it. When this is done the rotating arm, shown in the illustration, is exactly centered with respect to the axis of the hole. The adjustable arm is next extended and locked in a position where the short right-angled section just touches the outer edge of the wheel flange. By rotating this arm a check is made which determines whether the bore is properly centered.

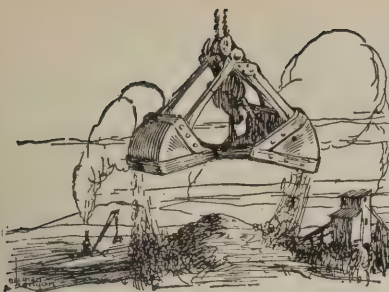
The best way to avoid accidents is to provide accurately machined repair parts.



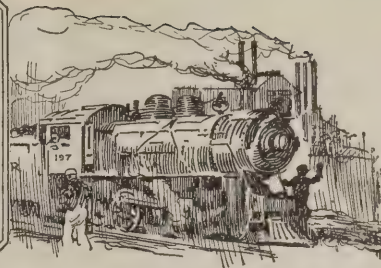
### Wheel-Testing Device

After the gage is put in position the adjustable rod is set to touch the outer edge of the wheel flange and rotated. If it touches the wheel at all points on the circumference the machinist is assured the wheel will not operate like an eccentric when mounted on a locomotive driving axle.





# Production And the Market



## Discouraging Conditions Fail to Dampen Optimism Of Bituminous-Coal Trade

Although visible foundation for hopefulness is lacking—in fact conditions seem to be growing even more discouraging for the time being—the bituminous-coal markets maintain a dogged confidence that the end of the prolonged period of depression is in sight or at the very worst is within hailing distance. As the coal business of late has fairly closely reflected general industrial conditions the predicted revival by leaders in the textile industry and the reported halt in the downward tendency in steel production are hailed as favorable omens. The president of one of the large coal roads, sailing for Europe last week, expressed his confidence that a turn for the better in business conditions would soon take place. All of which would indicate that the positive psychology that is the necessary prelude to a buying movement is being implanted.

### Hoover Reiterates Advice to Buy Now

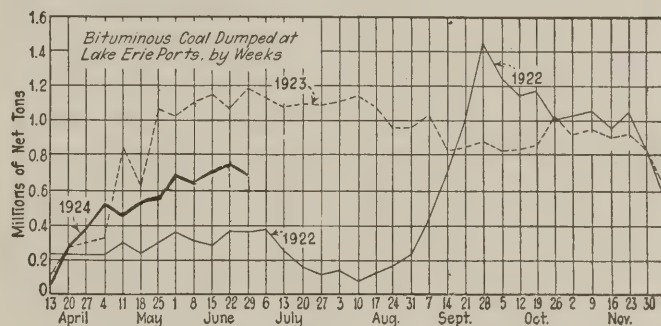
The latest financial report of the Erie R.R. indicates the far-reaching effect of the curtailment of coal movement on the earnings of the coal-carrying roads. That the roads are not doing as much to help themselves as they might is indicated by the reiteration of Secretary Hoover's advice to buy coal before autumn.

Coal Age Index of spot prices of bituminous coal continues to move, if at all, within a narrow range, the figure for July 7 receding to 164, the corresponding price for which is \$1.99. The index figure on June 30 was 166, which represents a price of \$2.01 per net ton, a level which held for three weeks.

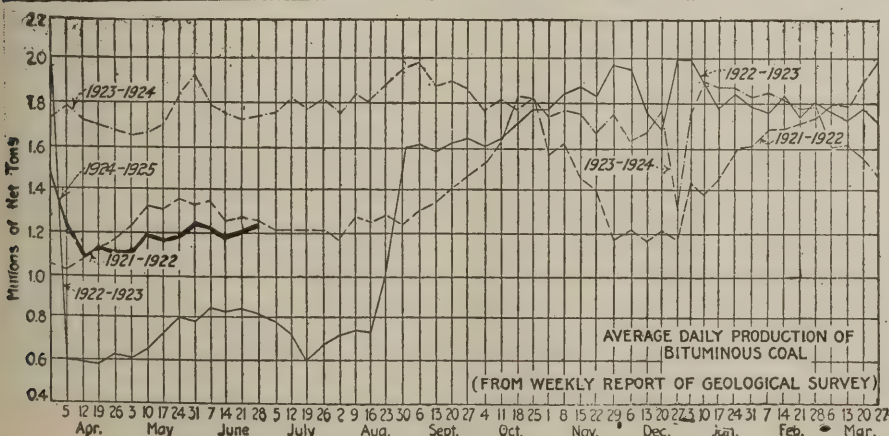
There has been a notable increase in activity at Hampton Roads, dumpings of coal for all accounts during the week ended July 5 totaling 401,935 net tons, representing a gain of 114,065 tons over the last week in June, when 287,870 net tons was handled. Coal dumped at Lake Erie ports during the week ended June 28, according to the Ore & Coal Exchange, was as follows: Cargo, 657,327 net tons; fuel, 41,393 tons.

The figures for the preceding week were 699,519 net tons of cargo coal and 41,168 tons of fuel coal.

The gradual upturn in the production of bituminous coal continues in evidence, output during the week ended June 28, according to the Geological Survey, reaching a total of 7,327,000 net tons, an advance of 125,000 tons over the revised figures for the preceding week, when 7,202,000 tons was produced. Anthracite production also registered an increase during the week ended June 28, when the output was 1,885,000 net tons. This compares with 1,823,000 tons during each of the two preceding weeks.



Quiet has settled over the anthracite market, demand being quite slow. As a result the supply is plentiful for practically all requirements, especially as interruptions to production by local labor troubles are less in evidence. Stove continues to lead in demand, the movement of egg and chestnut, such as it is, being largely dependent upon the amount of stove available. The smaller sizes, including pea and the steam, are inactive and accumulating steadily. The leading companies have added 10c. per ton to their July prices for egg, stove and chestnut, but the independents, having found it difficult to obtain even the old company circular, have announced no advances.



### Estimates of Production

(Net Tons)

#### BITUMINOUS

	1923	1924
June 14.....	10,573,000	7,152,000
June 21 (a).....	10,422,000	7,202,000
June 28 (b).....	10,458,000	7,327,000
Daily average.....	1,743,000	1,221,000
Cal. yr. to date (c)...	270,811,000	226,172,000
Daily average to date	1,770,000	1,479,000

#### ANTHRACITE

June 14.....	2,053,000	1,823,000
June 21.....	2,042,000	1,823,000
June 28.....	2,105,000	1,885,000
Cal. yr. to date (c)...	51,392,000	45,592,000

#### COKE

June 21 (a).....	398,000	131,000
June 28 (b).....	399,000	126,000
Cal. yr. to date (c)...	10,002,000	6,083,000

(a) Revised from last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.



### Midwest Screenings Softer

The week drilled along in the Midwest without much encouragement to the coal seller and producer. An anticipated slight strengthening of the market stirred up a slight increase in production, and then, when the market remained entirely dormant, prices had a tendency to weaken even from the low points of recent days. Thus southern Illinois screenings sank from a previous low of \$1.75 to a new low of \$1.60 and little moved at more than \$1.75 although there was a skim of country town business as high as \$1.90. Central Illinois prices were not affected. Indiana softened a shade, however.

And now the trade is looking forward to the latter half of this month to start the expected pick-up. Meantime strip mines in Illinois continue to get good running time meeting west Kentucky low prices. Anthracite throughout the Midwest made its scheduled increase of 10 or 12c. a ton without stirring up any business.

The Fourth of July lull prevailed during the week in southern Illinois and there was practically nothing doing, with several thousand cars of "no bills" of all sizes on hand. Much discontent prevails among miners on account of no work, although the field generally expects something to start after the Fourth. Some little activity in railroad coal

the last week has helped the situation somewhat. The mines are working from 1 to 2 and 3 days a week. Three days are rare and usually on railroad coal.

Things are quiet at St. Louis. A little domestic is moving for current business on account of wet cold weather. Wagonload steam has eased up and carload screenings shows a little activity, but other sizes are slow. Country steam is quiet and country domestic is just beginning to pick up. The tonnage of threshing coal this year is so small that it is not a factor any more. There is no change in retail prices and practically no early delivery of coal on account of rainy weather.

The oil refineries in the St. Louis switching limits are beginning to use more coal on account of warm weather making a better demand for gasoline. A continuous period of two warm weeks will show an increase of almost 25 per cent in the tonnage of coal used in the refineries.

### Kentucky Pick-Up Continues

While business is not at all rushing, volume has been somewhat better over the past week or ten days. Salesmen in the North and West are doing more, especially the commission salesmen, who have been making a hard drive, and retailers have been placing slightly better orders. Indus-

### Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern				Midwest			
Market	Quoted	July 9 1923	June 23 1924	June 30 1924	July 7 1924†	Market	Quoted
Smokeless lump.....	Columbus...	\$5.85	\$3.85	\$3.85	\$3.75@ \$4.00	Franklin, Ill. lump.....	Chicago.....
Smokeless mine run.....	Columbus...	3.25	2.20	2.20	2.10@ 2.35	Franklin, Ill. mine run.....	Chicago.....
Smokeless screenings.....	Columbus...	3.10	1.30	1.30	1.10@ 1.50	Franklin, Ill. screenings...	Chicago.....
Smokeless lump.....	Chicago.....	6.10	3.60	3.60	3.50@ 3.75	Central, Ill. lump.....	Chicago.....
Smokeless mine run.....	Chicago.....	3.60	2.00	2.00	1.75@ 2.00	Central, Ill. mine run.....	Chicago.....
Smokeless lump.....	Cincinnati...	6.00	3.85	3.85	3.75@ 4.00	Central, Ill. screenings...	Chicago.....
Smokeless mine run.....	Cincinnati...	3.60	1.85	1.80	1.60@ 2.05	Ind. 4th Vein lump.....	Chicago.....
Smokeless screenings.....	Cincinnati...	3.35	1.50	1.10	1.00@ 1.25	Ind. 4th Vein mine run.....	Chicago.....
*Smokeless mine run.....	Boston.....	5.35	4.30	4.30	4.25@ 4.40	Ind. 4th Vein screenings...	Chicago.....
Clearfield mine run.....	Boston.....	2.25	2.00	1.95	1.65@ 2.20	Ind. 5th Vein lump.....	Chicago.....
Cambria mine run.....	Boston.....	2.85	2.45	2.50	2.00@ 2.75	Ind. 5th Vein mine run.....	Chicago.....
Somerset mine run.....	Boston.....	2.50	2.15	2.15	1.80@ 2.50	Ind. 5th Vein screenings...	Chicago.....
Pool 1 (Navy Standard).....	New York.....	3.50	2.70	2.70	2.50@ 2.90	Mt. Olive lump.....	St. Louis.....
Pool 1 (Navy Standard).....	Philadelphia...	3.55	3.00	3.00	2.60@ 3.00	Mt. Olive mine run.....	St. Louis.....
Pool 1 (Navy Standard).....	Baltimore.....					Mt. Olive screenings...	St. Louis.....
Pool 9 (Super. Low Vol.).....	New York.....	2.75	2.20	2.20	1.90@ 2.40	Standard lump.....	St. Louis.....
Pool 9 (Super. Low Vol.).....	Philadelphia...	2.70	2.20	2.20	1.95@ 2.35	Standard mine run.....	St. Louis.....
Pool 9 (Super. Low Vol.).....	Baltimore.....	2.60	1.85	1.85	1.80@ 1.90	Standard screenings...	St. Louis.....
Pool 10 (H. Gr. Low Vol.).....	New York.....	2.35	1.85	1.85	1.65@ 2.00	West Ky. lump.....	Louisville.....
Pool 10 (H. Gr. Low Vol.).....	Philadelphia...	2.25	1.85	1.85	1.65@ 1.90	West Ky. mine run.....	Louisville.....
Pool 10 (H. Gr. Low Vol.).....	Baltimore.....	2.25	1.65	1.65	1.60@ 1.70	West Ky. screenings...	Louisville.....
Pool 11 (Low Vol.).....	New York.....	1.80	1.60	1.60	1.40@ 1.85	West Ky. lump.....	Chicago.....
Pool 11 (Low Vol.).....	Philadelphia...	1.85	1.50	1.50	1.35@ 1.60	West Ky. mine run.....	Chicago.....
Pool 11 (Low Vol.).....	Baltimore.....	2.05	1.55	1.55	1.50@ 1.60		

High-Volatile, Eastern				South and Southwest			
Market	Quoted	July 9 1923	June 23 1924	June 30 1924	July 7 1924†	Market	Quoted
Pool 54-64 (Gas and St.).....	New York.....	1.65	1.50	1.50	1.35@ 1.65	Big Seam lump.....	Birmingham...
Pool 54-64 (Gas and St.).....	Philadelphia...	1.55	1.55	1.55	1.40@ 1.60	Big Seam mine run.....	Birmingham...
Pool 54-64 (Gas and St.).....	Baltimore.....	1.75	1.50	1.45	1.40@ 1.50	Big Seam (washed).....	Birmingham...
Pittsburgh sc'd gas.....	Pittsburgh...	2.40	2.40	2.40	2.30@ 2.50	S. E. Ky. lump.....	Chicago.....
Pittsburgh gas mine run.....	Pittsburgh...		2.10	2.10	2.00@ 2.25	S. E. Ky. mine run.....	Chicago.....
Pittsburgh mine run (St.).....	Pittsburgh...	1.95	1.85	1.85	1.75@ 2.00	S. E. Ky. lump.....	Louisville.....
Pittsburgh slack (Gas).....	Pittsburgh...	1.50	1.20	1.20	1.15@ 1.25	S. E. Ky. mine run.....	Louisville.....
Kanawha lump.....	Columbus...	3.00				S. E. Ky. screenings...	Louisville.....
Kanawha mine run.....	Columbus...	1.85				S. E. Ky. mine run.....	Cincinnati...
Kanawha screenings.....	Columbus...	1.10				S. E. Ky. screenings...	Cincinnati...
W. Va. lump.....	Cincinnati...	3.25	2.25	2.25	2.00@ 2.50	S. E. Ky. mine run.....	Cincinnati...
W. Va. gas mine run.....	Cincinnati...	1.75	1.35	1.40	1.25@ 1.60	S. E. Ky. screenings...	Cincinnati...
W. Va. steam mine run.....	Cincinnati...	1.75	1.35	1.40	1.25@ 1.60	Kansas lump.....	Kansas City...
W. Va. screenings.....	Cincinnati...	1.05	.90	.85	.75@ 1.00	Kansas mine run.....	Kansas City...
Hocking lump.....	Columbus...	2.75	2.45	2.45	2.25@ 2.65	Kansas screenings...	Kansas City...
Hocking mine run.....	Columbus...	1.85	1.70	1.70	1.60@ 1.85		
Hocking screenings.....	Columbus...	1.25	1.35	1.35	1.30@ 1.45		
Pitts. No. 8 lump.....	Cleveland...	2.55	2.35	2.35	2.00@ 2.75		
Pitts. No. 8 mine run.....	Cleveland...	1.90	1.85	1.85	1.85@ 1.95		
Pitts. No. 8 screenings...	Cleveland...	1.25	1.10	1.10	1.05@ 1.20		

### South and Southwest

Market	Quoted	July 9 1923	June 23 1924	June 30 1924	July 7 1924†
Big Seam lump.....	Birmingham...	3.25	3.00	3.20	3.10@ 3.30
Big Seam mine run.....	Birmingham...	2.05	1.90	2.10	1.50@ 2.10
Big Seam (washed).....	Birmingham...	2.35	2.00	2.20	1.75@ 2.25
S. E. Ky. lump.....	Chicago.....	3.25	2.10	2.10	2.00@ 2.25
S. E. Ky. mine run.....	Chicago.....	2.35	1.60	1.60	1.25@ 1.75
S. E. Ky. lump.....	Louisville.....	2.75	2.10	2.10	2.00@ 2.25
S. E. Ky. mine run.....	Louisville.....	1.85	1.50	1.55	1.35@ 1.75
S. E. Ky. screenings...	Louisville.....	1.05	.95	.95	.85@ 1.10
S. E. Ky. mine run.....	Cincinnati...	3.25	2.50	2.50	2.25@ 2.75
S. E. Ky. screenings...	Cincinnati...	1.60	1.45	1.45	1.25@ 1.65
S. E. Ky. mine run.....	Cincinnati...	1.05	.90	.90	.75@ 1.10
Kansas lump.....	Kansas City...	4.00	4.50	4.50	4.50
Kansas mine run.....	Kansas City...	3.25	3.50	3.50	3.50
Kansas screenings...	Kansas City...	2.60	2.50	2.50	2.50

\* Gross tons, f.o.b. vessel, Hampton Roads.

† Advances over previous week shown in heavy type, declines in *italics*.

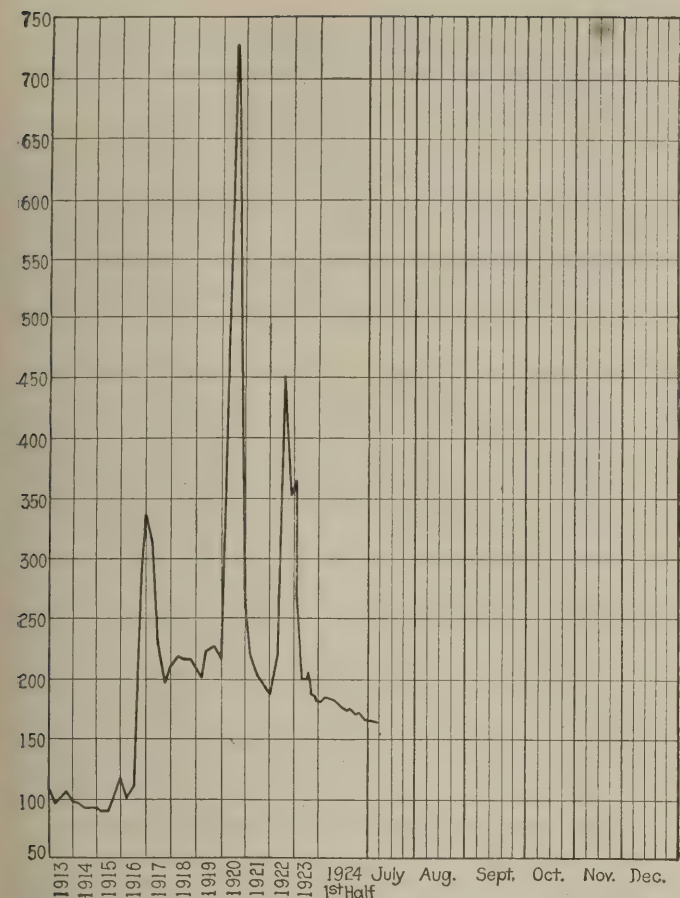
‡ On strike.

### Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

		Market	Quoted	Freight	July 9, 1923	June 30, 1924	July 7, 1924†
				Rates	Independent	Company	Independent
Broken.....	New York.....	\$2.34			\$7.75@ \$8.35	\$8.00@ \$8.85	\$8.00@ \$8.95
Broken.....	Philadelphia...	2.39			7.00@ 8.10	8.70@ 8.85	8.80@ 8.95
Egg.....	New York.....	2.34			\$8.50@ \$12.00	\$8.75@ \$9.00	8.75@ \$9.00
Egg.....	Philadelphia...	2.39			9.25@ 11.00	8.10@ 8.35	8.80@ 8.95
Egg.....	Chicago.....	5.06			8.50@ 12.00	7.25@ 7.45	7.86@ 8.00
Egg.....	Chicago.....	5.34			8.50@ 12.00	8.00@ 8.35	9.00@ 9.25
Stove.....	New York.....	2.39			9.25@ 11.00	8.15@ 8.35	9.15@ 9.80
Stove.....	Philadelphia...	5.06			8.50@ 12.00	7.25@ 7.45	8.17@ 8.30
Chestnut.....	Chicago.....	2.34			8.50@ 12.00	8.00@ 8.35	8.13@ 8.23
Chestnut.....	New York.....	2.39			9.25@ 11.00	8.75@ 9.00	8.45@ 8.95
Chestnut.....	Philadelphia...	5.06			8.50@ 12.00	8.15@ 8.35	8.85@ 8.85
Chestnut.....	Chicago.....	5.34			8.50@ 12.00	7.25@ 7.45	8.00@ 8.13
Range.....	New York.....	2.34			8.30	8.70	8.08@ 8.13
Pea.....	New York.....	2.22			6.75@ 8.00	4.50@ 5.50	5.50@ 6.00
Pea.....	Philadelphia...	2.14			7.00@ 7.50	6.15@ 6.20	5.75@ 6.00
Pea.....	Chicago.....	4.79			7.00@ 8.50	5.50@ 5.65	5.13@ 5.45
Buckwheat No. 1.....	New York.....	2.22			2.75@ 3.50	2.00@ 2.75	2.00@ 2.75
Buckwheat No. 1.....	Philadelphia...	2.14			2.75@ 3.50	2.50@ 3.00	2.50@ 3.00
Rice.....	New York.....	2.22			1.80@ 2.50	1.50@ 2.15	1.50@ 2.15
Rice.....	Philadelphia...	2.14			1.75@ 2.50	2.50	2.00@ 2.25
Barley.....	New York.....	2.22			1.25@ 1.50	1.50	1.10@ 1.50
Barley.....	Philadelphia...	2.14			1.15@ 1.50	1.50	1.50
Birdseye.....	New York.....	2.22			1.60	1.60	1.10@ 1.50

\* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in *italics*.





	1924			1923
	July 7	June 30	June 23	July 9
Index .....	164	166	166	197
Weighted average price .....	\$1.99	\$2.01	\$2.01	\$2.38

This diagram shows the relative, not the actual, prices on four-teen coals, representative of nearly 90 per cent of the bituminous output of the United States weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board.

trial business continues a little quiet due to the dullness in some metal-working interests, the auto trade, etc.

The eastern Kentucky fields appear to be operating on a very fair basis and are increasing production as a result of better movement to the Lakes, to large retailers and to scattered utilities and industrial consumers. Cool weather has resulted in ice- and cold-storage plant consumption being relatively light, while refiners are principally burning fuel oil instead of coal on the present screenings market. Prices show no material change.

Western Kentucky is producing a little more. Prices in western Kentucky show no change over the week. Strip operators apparently are very busy. There has been a fair movement from western Kentucky on stove sizes to the South, with some scattered movement to nearby districts, Michigan and the North and Northwest.

### Northwest Trade Is Slow

The coal market at Duluth is still very quiet and sales are at a standstill with the exception of scattering public-utility contracts. The only movement of coal from the docks is by the railroad companies, which are taking coal for storage elsewhere against the time of the grain movement and possible coal movement.

The movement to the docks last week was good. Thirty-one cargoes arrived in all, of which three were hard coal. Twenty-two were reported en route, of which seven are hard coal. This report of the cargoes en route is exceptionally good for the present season. The docks here need about 1,400,000 tons of anthracite to carry through. This

means that the shipments must continue steadily until the fall in order to supply the demand.

The soft-coal situation may be worse than it looks too. Many mines are reported shut down and many of the lake carriers are tied up, as the result of a scarcity of cargoes in grain and ore.

Little anthracite is moving out now. Retailers report poor collections. Anthracite took its monthly increase of 10c. on July 1. Prices of bituminous are the same, and seem to be holding firmly.

July finds the coal market at Milwaukee exceedingly quiet but hopeful. With the exception of the usual monthly advance of 10c. on all grades of anthracite except buck-wheat, coal prices remain unchanged. Soft coal moves sluggishly. The record of cargo arrivals during June shows an aggregate of 143,197 tons of anthracite and 273,363 tons of soft coal. This makes the total receipts for the season thus far by lake 282,505 tons of anthracite and 599,462 tons of soft coal.

### West Fights for Business

A scramble for business in Oklahoma has resulted in a slash of from \$1 to \$1.50 a ton in the price of Henryetta coal. It is now quoted at \$4@\$4.50 for lump, \$3.50@\$4 for nut; \$3@\$3.75 for mine run and \$2@\$2.25 for screen-ings. Few mines are working.

There has been little change in the situation in Kansas. The threshing demand is a little more brisk, but there has been no improvement in the other markets. A slight increase in storage of Arkansas semi-anthracite is apparent. Prices on both Kansas and Arkansas coals are unchanged.

The only change noted in the Colorado market was another advance in prices effective July 1. Walsen and Canon City lump, nut and slack being \$4.75, \$4.25 and \$3.25 respectively. Crested Butte high-grade anthracite is \$7. Dealers still refuse to place summer orders and movements on all sizes are slow. Mines worked on an average of 18 hours last week. Forty-seven per cent of working time lost was attributed to "no market."

In Utah coal prices are on the upgrade. Operators have just announced a new schedule as follows: Lump, \$4.25; stove, \$4.25; domestic lump, \$4; nut, \$3.50; slack, \$1.50. This schedule is a little different from the old schedule in matter of grades. There has been very little storage of coal so far. Mines are operating a little better than two days a week. Practically no coal contracting is reported.

### Some Improvement at Cincinnati

The Cincinnati market shows signs of slight improvement. Both steam and domestic inquiries are numerous and real orders significantly better. There was more than a 15 per cent increase last week in moving tonnage from West Virginia and Kentucky in spite of a two-day rest in mining in connection with the national holiday. There also was a slight increase in lake business and buyers are saying here that their requirements for July will be from 30 to 50 per cent above those for June. The additional demand has not thus far caused any enhancement of wholesale prices, which continue so low as to afford the barest margin of profit.

With midsummer dullness prevailing in the domestic trade, there is practically no change in the Columbus market. Buying on the part of all classes of users is limited to immediate wants. Everyone seems to be playing a waiting game. Domestic trade is not quite as brisk as formerly. Householders in many cases are holding off in the belief that low prices will continue throughout the summer. Smokeless and splints are in the best demand from dealers although a fair amount of southern Ohio grades is sought. Retail prices are unchanged and are generally well maintained. Owing to lack of production and the closing of many large mines there is not much distress coal on the market. Steam trade is quiet, as has been the rule for several months.

Business in the Cleveland market fell off because of the holiday, but spot prices have not shown any weakening due to this cause. Demand for lake cargo fuel is lessening, which is attributed to the heavy tonnages now at the upper docks and the slow movement therefrom. Inquiries are negligible in the steam trade, and an active resumption of industrial operation is hardly looked for before the middle of July. Railroads report no improvement in the volume of general traffic and this has resulted in the curtailment of their consumption. Despite the conditions herein set forth, there is a feeling of optimism that the low point in coal



supply and demand has about passed, and an upturn will come within the next thirty days.

The Pittsburgh market shows no improvement. Prices are unchanged, except that slack is off 5c. This is due to offerings of strip mines, which crush coal to make slack, as that at least can be sold.

The entire trade at Buffalo is even more quiet than usual at this time of the year, though this is the dull season. And the outlook is far from promising. Prices are lower than at any other time since the war.

Inaction prevails in the Toronto market with practically no demand for soft coal. Although the hard-coal market is generally slow at this time of year, one Toronto firm reports fairly brisk business. The small dealers, however, are getting very few orders.

### New England Market Almost Stagnant

In New England the steam-coal trade drags along with almost no relieving features. Both all rail and by water there is still a great dearth of business, and in no direction is there much hopeful sentiment for July and August. Output is being held down in drastic fashion, but there are accumulations at practically every pier. Inquiry is extremely light and trade is almost stagnant.

At Hampton Roads the shippers are following out their close-hauled policy of May and June. On No. 1 Navy Standard Pocahontas and New River the range of \$4.25@ \$4.40 per gross ton f.o.b. vessel still obtains, with now and then a slight modification to dispose of distress coal. The less desirable grades sell down to \$3.85, but these are not much heard from in this market. Occasionally there are mixtures offering at the railroad wharves for distribution inland that account for prices on cars at less than \$5.50, but the No. 1 coals are being held with reasonable firmness at from that figure to \$5.75.

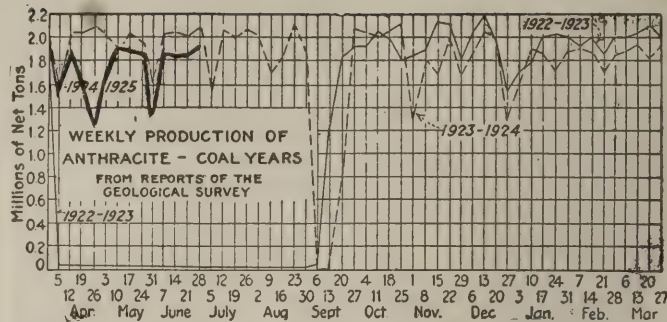
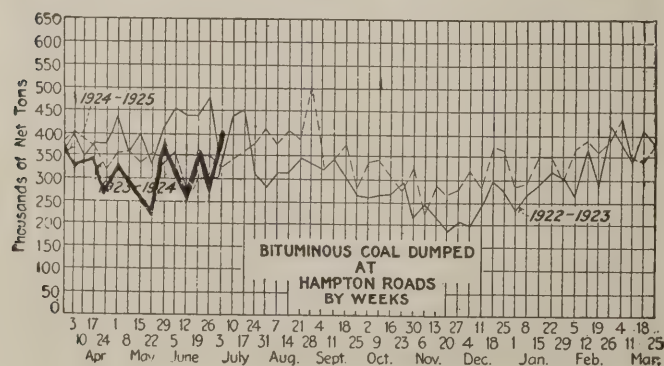
All-rail from central Pennsylvania trade is particularly dull, although not much different from any time since March. A few producers of non-union coals are making special efforts to move output this month to show the organization how idle it is to make labor contracts on the present union scale. Prices are therefore reduced in some quarters, but it is hard to find users even at a much lower level.

At retail the trade shows the demoralization consequent upon such a situation at wholesale. During last week a municipal school contract in the vicinity of Boston was taken at less than \$6.42 per net ton delivered. Subtracting teaming charges, marine freight, discharging, etc., leaves rather a small residuum for the operator.

### Seaboard Markets Dull but Hopeful

Conditions at New York underwent practically no change during the last week. Prospects of increased business are not evident at present. Coal continues to come to tidewater in increased tonnage, and as a result is being sold at what are considered low prices. Buying along the line is a trifle more brisk and prices are on a firmer basis. Few contracts are reported as closed recently. Some railroads are said to be adding to their reserves and contract coals are moving easily, but consumers are not inclined to take more than their contracts call for.

The Philadelphia market remains flat. The holiday may add a little impetus to the trade this week. Renewed buying is believed to be almost at hand, as stockpiles are disappearing, except at utility plants. Industrial conditions, however, are not much improved. There has been a slight softening in prices in desperate drive for business, and



this has induced a number of producers to meet quotations.

The situation in Baltimore and vicinity with regard to both steam and gas coal continues most uninterestingly dull. Low prices continue to prevail, but there is not much sacrificing at tide, as fuel handlers are cautious in placing their orders without an assured outlet. After a very poor start in June the export trade woke up and a fair total went out for foreign delivery. Fourteen steamers carried 59,450 tons of cargo and 4,720 tons in bunkers.

There has been no favorable turn in the Birmingham coal market. Inquiry is extremely weak for all grades of coal. Industrial requirements are lighter than for several years at this season. There is little call for spot domestic and retail yards have pretty well stocked upon contract fuel and are now waiting for the ultimate consumer to order his winter coal—a matter that seems to be receiving scant attention at this time, as the retail market is showing little activity. Quotations f.o.b. mines have changed very little for several weeks, a few grades being slightly lower.

### Hard-Coal Demand Quiet; Supply Ample

Labor troubles at the mines have ceased to affect the supply of hard coal at the New York tidewater market. Arrivals are ample for requirements. Except in the case of stove coal, demand is quiet; the movement of egg and chestnut in fact depends almost entirely upon the available tonnage of stove. All of the larger companies have added 10c. per ton to their June prices for egg, stove and chestnut, but because of the dullness of the market no change is reported by the independents, who find it difficult at times to obtain anything like company prices for their product. Some operators continue to break their broken coal in order to keep up mining, while pea coal is being stored in good volume. Steam coals are inactive and accumulating rapidly. There is practically no demand for free coals of the three small sizes and only contracts prevent heavier storing. Quotations for independent coals are low, only the best grades being held close to full company schedules.

The Philadelphia market is extremely quiet, the retail trade having slipped away to almost nothing and dealers are holding their orders generally. As expected, company shippers added 10c. a ton to the prices of the large sizes, leaving pea and steam sizes untouched. The independents also increased their prices on egg and stove, some leaving nut at last month's price, while others even reduced nut. Pea also was unchanged. Nut is moving so poorly that it may be necessary to store it soon, and pea is nearly as bad. Stove continues in strong demand, with egg also in good call. Retail prices are unchanged despite the increase at the mines.

Retail prices have again advanced in Baltimore as a result of new wholesale advances. The increase ranges from 25 to 50c. per ton, the new schedule being as follows: hard white ash, No. 1 (broken), \$15.50; No. 2 (egg), \$15.75; No. 3 (stove), \$16; No. 4 (chestnut), \$15.75; pea, \$11.50; buckwheat, \$8.50; Sunbury, No. 2 (egg), \$16; No. 3 (stove), \$16.25; Lykens Valley, No. 2 (egg), \$16.75; No. 3 (stove), \$17.

### Car Loadings, Surpluses and Shortages

	Cars Loaded—	
	All Cars	Coal Cars
Week ended June 21, 1924.....	903,700	140,807
Previous week.....	902,710	138,252
Week ended June 23, 1923.....	1,004,982	183,402
	Surplus Cars—	
	All Cars	Coal Cars
June 22, 1924.....	359,644	167,315
Previous week.....	362,961	169,133
June 22, 1923.....	58,671	4,269
Car Shortage—		
	11,896	7,976



Foreign Market  
And Export News

British Market Better but Still Below  
Average; Output Rebounds

The Welsh coal market is slightly better since the Whitsuntide holidays and the return of the railway shopmen to work, but sales are still below the average and shipping tonnage is ample. The passing of the French political crisis and the slight improvement in the exchange has led to more business with France. Some of the older and more expensively operated pits have been closed down as the result of the increase in working costs brought about by the recent agreement between operators and miners. In some cases the Ministry of Mines has intervened to induce the owners to reopen the closed pits, which will be done if the miners agree to work double shift to reduce the costs of operation. South American business is below the average and European business is very slow.

There has been an increased number of contract inquiries on the Newcastle market, especially for gas coals, but otherwise the market remains in the

same state as last week. Prices are very low, in many cases below the cost of production. The French State Railways have placed orders for 10,000 tons of Durham coking coals of guaranteed analysis at 20s. f.o.b., and also for 30,000 tons of Welsh coals. The Swedish State Railways have taken 60,000 tons of steams at 26s. 9d.; Copenhagen Sugar Works, 15,000 tons of steam smalls at 12s. 5d. f.o.b.; West-eras Railway of Sweden, 20,000 tons of steams at 21s. f.o.b. The French Est Railway is negotiating for 20,000 tons of Durham coals, and the German State Railways are inviting offers for steam coals.

Production by British collieries during the week ended June 21, a cable to *Coal Age* states, was 5,173,000 tons. This was a marked rebound from the previous week, when the output was only 3,236,000 tons owing to the observance of Whitweek, according to the official Board of Trade returns.

**Fair Trade at Hampton Roads; Outlook Is Promising**

Business is fair at Hampton Roads, with some contracts going to New England and with foreign movement dropping slightly, due to expiring contracts. General bunker business also is fair, though the market has weakened slightly.

There has been the usual slow-up for the holiday and shippers predicted a pick-up for the following week, the reduced holiday supply being expected to have a tendency to cause the market to strengthen somewhat.

The tone of the market is dull, but the outlook is promising, although no unusually heavy business is in sight for the immediate future. June's dumping record showed an improvement over the previous month, and the trade appeared fairly well satisfied with the situation.

**Conditions in French Market Show Slight Change**

The situation in the French coal market shows comparatively little change. Output is increasing and is being pushed as much as possible. Demand, however, is equal to supply; in fact, in the Nord and Pas-de-Calais there are no available stocks, the volume of orders in sized products precluding the collieries disposing of any quantities other than those covered by contract. The bituminous grades are quite neglected.

The recent decline of sterling has lessened the difference prevailing between the prices of British and French coals; nevertheless, the quotations on the latter continue to be the more attractive. The prices of anthracites remain prohibitive.

The supply of rolling stock to the mines is satisfactory and the freight

rate is quoted at 20 fr. Bethune-Paris. In the Nord and Pas-de-Calais, the complements of wages granted by the companies as from November, 1923, and continued until June 30 of this year, have been renewed until Sept. 30, at which date further steps will be taken. It is likely, therefore, that prices will remain unchanged. However, until July 31 or Aug. 15, a summer premium of 8 fr. per ton will be allowed to retailers.

**Ruhr Prices Cut 20 per Cent**

Price schedules on all Ruhr district coals have been reduced 20 per cent, in order to stimulate sales, which have recently taken a sharp decline.

**Export Clearances, Week Ended July 5, 1924**

FROM PHILADELPHIA		Tons
For Cuba:		
Nor. Str. Lisbeth for Havana.....		.....
FROM BALTIMORE		
For Italy:		
Ital. Str. Giovanni.....		10,690
For Cuba:		
Br. Str. Berwindmoor.....		1,522
For France:		
Swd. Str. Stureholm.....		7,051
FROM HAMPTON ROADS		
For Canada:		
Nor. Str. Bjornstjerne Bjornson, for Three Rivers.....		8,161
Br. Str. Lord Ormonde, for St. John.....		5,367
For Chile:		
Jap. Str. Belgium Maru, for Iquique.....		4,621
For China:		
Br. Str. Romeo for Hong Kong.....		2,404
For France:		
Br. Str. Exmoor, for Marseilles.....		7,533
For Germany:		
Ger. Str. Ludwigsteiner, for Hamburg.....		3,034
For Italy:		
Ital. Str. Mergheb, for Porto Ferrajo.....		6,205
For West Indies:		
Nor. Str. Skogheim for Port of Spain.....		3,510

**Hampton Roads Pier Situation**

N. & W. Piers, Lamberts Pt.:	June 28	July 5
Cars on hand.....	1,205	1,238
Tons on hand.....	76,843	74,708
Tons dumped for week.....	102,165	142,164
Tonnage waiting.....	15,000	20,000
Virginian Piers, Sewalls Pt.:		
Cars on hand.....	1,355	1,551
Tons on hand.....	981,200	115,200
Tons dumped for week.....	86,998	91,037
Tonnage waiting.....	2,851	167
C. & O. Piers, Newport News:		
Cars on hand.....	1,892	1,337
Tons on hand.....	94,665	69,036
Tons dumped for week.....	67,863	125,668
Tonnage waiting.....	2,305	14,710

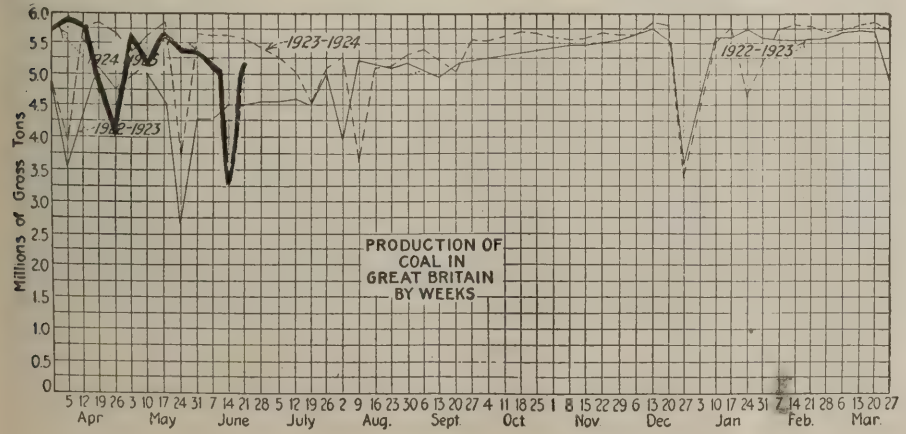
**Pier and Bunker Prices, Gross Tons**

PIERS		June 28	July 5†
Pool 9, New York.....	\$4.60@	\$5.00	\$4.60@ \$5.00
Pool 10, New York.....	4.50@	4.75	4.50@ 4.75
Pool 11, New York.....	4.35@	4.50	4.25@ 4.50
Pool 9, Philadelphia.....	4.70@	5.05	4.70@ 5.00
Pool 10, Philadelphia.....	4.45@	4.80	4.45@ 4.70
Pool 11, Philadelphia.....	4.30@	4.55	4.30@ 4.50
Pool 1, Hamp. Roads.....	4.35@	4.40	4.30@ 4.35
Pool 2, Hamp. Roads.....	4.15@	4.20	4.15@ 4.20
Pools 5-6-7, Hamp. Rds..	4.00@	4.10	4.00@ 4.10
BUNKERS		June 28	July 5†
Pool 9, New York.....	4.90@	5.30	4.90@ 5.30
Pool 10, New York.....	4.80@	5.05	4.80@ 5.05
Pool 11, New York.....	4.65@	4.80	4.55@ 4.80
Pool 9, Philadelphia.....	5.00@	5.40	5.00@ 5.30
Pool 10, Philadelphia.....	4.75@	5.00	4.75@ 4.95
Pool 11, Philadelphia.....	4.50@	4.80	4.50@ 4.70
Pool 1, Hamp. Roads.....	4.40		4.35
Pool 2, Hamp. Roads.....	4.20		4.20
Pools 5-6-7, Hamp. Rds..	4.10		4.10

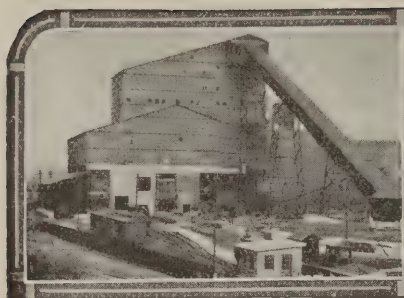
**Current Quotations British Coal f.o.b. Port, Gross Tons**

Quotations by Cable to <i>Coal Age</i>		June 28	July 5†
Admiralty, large.....	28s. 3d. @ 28s. 6d.		28s. 6d.
Steam smalls.....	18s. 6d. @ 19s.		18s. @ 18s. 6d.
Newcastle:			
Best steams.....	20s. @ 21s.		19s. 6d. @ 20s.
Best gas.....	23s. @ 23s. 6d.		23s. @ 23s. 6d.
Best bunkers.....	20s. @ 21s. 6d.		22s.

† Advances over previous week shown in heavy type, declines in *italics*.







## News Items From Field and Trade



### ALABAMA

The Sloss-Sheffield Steel & Iron Co. has entered the retail coal trade by the establishment at its City Furnace plant of a battery of storage bins from which it will dispense direct to consumers its lump and washed nut coal as well as its line of domestic nut coke.

It is reported from Scottsboro, Jackson County, that the Pierce coal mines, near Limrock, have been purchased by a corporation which will place the mines in operation soon. This operation has been idle for about ten years. A spur track is now under construction from Limrock, on the Southern Ry., to the mine site.

The board of mine examiners will hold a session in the offices of C. H. Nesbitt, chief mine inspector, Lincoln Life Bldg., Birmingham, July 21-24, to consider applications from candidates who would occupy positions as mine foremen and firebosses in Alabama mines. The personnel of the recently appointed board is as follows: C. H. Nesbitt, chairman; Sam Y. Leith, C. M. Parker, C. E. Bowron, F. G. Long and J. S. Kellum.

### COLORADO

During the month of May, Colorado mines produced 678,345 tons of coal. This is a decrease of 54,128 tons as compared with the corresponding month last year. The total number employed in and about the mines in May was 12,648.

The Victor-American Coal Co. has abandoned its Grey Creek mine and the State Public Utilities Commission has granted the Colorado & Southern R.R. permission to tear up the 7-mile spur line from Beshoar Junction to the mine site.

### IDAHO

Teton coal is to get railroad service. The State Utilities Commission, following the long series of recent hearings, has ordered the Oregon Short Line to repair and operate its 11-mile spur from Tetonia Junction to the Brown Bear mine of the Teton Coal Co., and the coal company is required to post a bond of \$27,160 with the railroad company, covering the cost of putting the line back into service. The coal company guarantees to ship at least 29,920 tons of coal per year. The railroad had objected to spending the money on the spur, asserting that the effort of H. F. Samuels to open the mine was mainly a political move to further his probable candidacy for Governor and that he did not intend to produce much coal.

Samuels insisted he was in earnest as a coal producer and got a good many towns worked up over the prospect of getting coal from him at low cost. The hearings attracted much attention.

### ILLINOIS

A. T. Allen has been appointed coal transportation agent of the Chicago & Eastern Illinois Ry. at Chicago. The position of manager of coal traffic, formerly held by the late D. R. Patterson is abolished. Mr. Allen's appointment was effective July 1.

Some Illinois mines are reopening. The Marion County Coal Co. has resumed work at its Glenridge mine after having been closed down since April 24. The mine at Rutland, which has been at a standstill for several weeks, also has been reopened. Coal rights under adjacent property have been obtained and it is thought that these rights will pave the way for other additions.

A receiver was asked for the O. K. Coal Co., of Marissa, in a petition filed in U. S. District Court at East St. Louis, on June 27, by Arthur C. Smith and John Henderson, stockholders, both of St. Louis, Mo. Gross mismanagement is charged. The company was incorporated in 1917 and operated under its own name until 1922, the petition states, at which time it entered into an agreement with the Egyptian Coal & Mining Co. whereby the latter gained control of the O. K. company, both companies having the same majority stockholders and officers. It is further alleged that the mines of the company were closed down this year and have been allowed to fill with water and gas, so that they are unworkable. The property of the O. K. company is estimated at \$125,000 in the petition.

### INDIANA

Cairy Littlejohn, of Indianapolis, state mine inspector and formerly a resident of Hymera, Ind., has been admitted to the Sullivan County Bar.

About 60 per cent of Indiana mines are idle and the coal mining industry in the state still remains in the dumps. If the present rate of production is maintained during the remainder of the year, only about 50 per cent of the normal production will result. Operators say Indiana coal is suffering because of competition from non-union fields. They say a lower wage scale would be the solution.

W. J. O'Brien, of Chicago, is suing to gain possession of a majority of the

stock of the Glendora Coal Co., which he claims to have bought and paid for with \$577,500, but which has never been completely delivered. His suit is against the First National Bank of Vincennes; Joseph E. Paplante, its president; the Glendora Coal Co. and John L. Baker, its president, and Frank P. Emison, its treasurer. O'Brien claims Baker deposited only 1,785 shares of the stock and not the full 2,100, which would have given O'Brien control of the company.

According to a report by Cairy Littlejohn, chief mine inspector of Indiana, 12,289,296 tons of coal was mined in the state during the first half of the present fiscal year. The report shows that \$20,932,231.52 in wages was paid to Indiana miners during the same period. The total amount of wages for all the last fiscal year was \$45,920,877.54. The number of employees for the first six months of the present year, as shown in the report, totals 23,861, as compared with 31,189 for all of last year. The number of fatal accidents totals 33, which is less than for the same period of last year.

### KENTUCKY

W. H. Jones, of Prestonsburg, has been appointed by Governor Fields as Chief Mine Inspector of the state, succeeding L. V. Blenkinsopp, of Lexington, whose term of office has expired, the latter having been appointed when Gov. Morrow, Republican, was in the Governor's chair.

Fred M. Sackett, of the Byrne & Speed Coal Co. and allied interests in Louisville, which operate a number of coal mines in the state, has filed papers as candidate for Republican nomination for the U. S. Senate, and will wage an active campaign in the autumn for election if he is nominated.

The annual production report of mines in the northeast Kentucky district recently completed by C. J. Neekamp, secretary of the Northeast Kentucky Coal Association, and F. E. Durham, statistician, shows the tonnage produced from 1910 to 1923, inclusive. A black and white chart in thermometer form shows production from 1906 to 1922, inclusive, along with tonnage for each mine, and total tonnages by mines from 1910 to 1922, inclusive. Figures by mines for 1906 to 1909 are not available, and only totals for the field in those years are shown. In 1923 the field broke all previous records with a total production from 180 mines of 7,464,185 tons, bringing field production from 1906 through 1923 to 55,672,525 tons.



The Himyar Mines, of the Himyar Coal Co., Domino, in Perry County, have closed indefinitely. A fire underground started several weeks ago. The blaze followed an explosion in which one man was killed and others hurt. The mines were sealed and the fire was reported out. When the fans were again started the blaze rekindled, and the mines have now suspended indefinitely.

Increases in tax assessments are being fought by many coal companies in the state. The St. Bernard company, whose properties were assessed at \$1,534,000, is fighting an increase of \$800,000; the Fordson Coal Co. is fighting an increase from \$2,000,000 to \$3,000,000, and the Kentland Coal Co., in Pike County, which made a return of \$1,600,000, is protesting a \$400,000 increase.

The Louisville & Nashville R.R. Co. some weeks ago denied a report of friction existing between that road and the Southern Ry. whereby the Southern would withdraw from the Middlesboro field, over refusal to pay an increased rental use on trackage of the L. & N., yet for some reason mines serving the Southern are shutting down. The Fork Ridge mines, employing 300 men, were ordered down on July 1.

Loading records from western Kentucky show four mines of the St. Bernard Mining Co. producing coal on June 26 and 27 under the new agreement with 20-per cent reduction in wages, whereby the workers withdrew from the United Mine Workers, and formed a Mutual Welfare Association. It was reported on June 28 that 310 men had been busy getting some of the plants in shape for operation, and that of the men who returned to work on June 25, six quit the next day.

## MINNESOTA

Robert D. Loudon, president of the Loudon Coal Mining Co., of southern Illinois, now in receivership, has been indicted in Minneapolis by the grand jury, on a charge of embezzlement. He was arraigned in district court and entered a plea of not guilty. Bail was fixed at \$5,000. The charge brought by the grand jury was for grand larceny in the first degree, and alleges that as president of the company, he

embezzled \$2,600 of company funds by trading 2,600 dollar bonds for 160 acres of Montana land, placed in his own name. The Loudon Coal Co. was formed in Minneapolis by Mr. Loudon to operate coal yards to association members and thereby reduce the cost of fuel.

## NEW YORK

The Pennsylvania Coal & Coke Co. reports a May deficit of \$49,540 after ordinary taxes, depreciation and depletion, but before federal taxes, comparing with a profit of \$79,707 a year ago. For the five months the deficit was \$86,513, against a profit of \$549,320 in the same period of 1923. The gross revenue in May was \$430,046, representing a decline of \$306,580 from last May.

The United States Distributing Corporation, New York City, will handle in excess of 5,000,000 tons of anthracite and 2,000,000 tons of bituminous coal in 1924, according to a statement by Harry N. Taylor, president of the corporation. This compares with 1,000,000 tons of anthracite and 300,000 tons of bituminous coal distributed last year. Both the corporation's full sales department and its distributing subsidiary, the U. S. Trucking Corporation, have extended their facilities this year to make possible the placing of this additional tonnage.

Since the beginning of Burns Bros., fiscal year, April 1, the company has retired \$94,300 of prior preference stock at 120 and dividends, leaving only \$775,000 of the original \$1,292,100 outstanding, Frank L. Burns, president, announced last week. Owing to the cool weather the earnings in April and May were better than were anticipated, and the company will enter the fall better off than last year, he declared.

## NORTH DAKOTA

At the annual meeting of stockholders of the Washburn Lignite Coal Co., held at Minneapolis, plans were laid for continuing the successful operation of its mines at Wilton, where the company has produced lignite since 1901.

The following officers were re-elected for the ensuing year: President, W.

P. Macomber, Wilton, N. D.; Vice President, Stanley Washburn, Lakewood, N. J.; Secretary and Treasurer, Jefferson Steiner, Bismarck, N. D.; General Manager, W. P. Macomber, Wilton, N. D.

## OHIO

The Jobs mine, at Murray City, has resumed work after a long suspension. About 50 men have been given work.

William S. Harman, of the W. S. Harman Coal Co., of Columbus, will soon start the development of a large stripping operation adjacent to the new power plant of the Ohio Power Co., located at Philo, on the Muskingum River. Mr. Harman and associates acquired the tract some time ago and a contract to furnish fuel to the power company has been signed and thus active development work will start. Steam shovels and other stripping equipment will be installed.

Bondholders of the Superior Coal & Dock Co., of Superior, Wis., which is a subsidiary of the Maynard Coal Co., of Columbus, now in the hands of William S. Harman and Frank L. Stein as receivers, met with representatives of the Ford Motor Co. in Columbus July 1 to discuss the offer made by the Ford Co. of \$658,500 for the dock properties. No change was made in the offer and a number of legal tangles appeared to cloud the situation. Further conferences will be held which may result in closing the deal.

A new chapter of the Joseph A. Holmes Safety Association has been organized at Senecaville, Ohio, designated as Chapter No. 95. The officers of this chapter are: J. S. Channel, president; C. O. Harding, vice-president; M. C. Miley, secretary-treasurer, and W. Christian, educational director. A charter was granted Cambridge Safety Chapter No. 96, Cambridge, on May 29. The officers of this chapter are: John Rigby, president; Charles Richardson, vice-president; H. C. Knapper, secretary-treasurer; J. W. Rarick, safety director, and Arthur G. Faught, educational director.

Medals have been received at the headquarters of the Ohio Mining Department, Columbus, from the Wheeling Steel Corporation, Wheeling, in recognition of the good work done by the chief and assistant inspectors of the department in the explosion of the Benwood mine in April in which 119 lives were lost. The medals are of bronze bearing a wreath inclosing a miner's safety lamp and the inscription "For Exceptional Service Rendered Humanity." On the reverse side is the inscription "Benwood Mine Explosion, April 28, 1924." The medals were awarded to Jerome Watson, chief inspector; P. W. Moore, first-aid and rescue supervisor, and the 10 Ohio deputies who aided in the rescue work.

The Red Jacket Consolidated Coal & Coke Co., which formerly had general offices at Detroit, has been taken over by the W. M. Ritter Lumber Co., of Columbus, and the general offices moved to the Hartman Building, Columbus. The company, which controls a large acreage with a capacity of ap-



Courtesy U. S. Distributing Corp.

## Underwood Colliery, Pennsylvania Coal Co., Throop, Pa.

This mine on the Erie R.R., near Pittston, Lackawanna County, Pennsylvania, mines coal from six seams. The many beds in the anthracite region make its operations more permanent than those in the bituminous field.



proximately 100,000 tons monthly, is functioning as a separate entity, although a subsidiary of the Ritter company. H. T. Wilson is president and T. H. Wilson is sales manager. The properties are located in Mingo County, West Virginia.

### OKLAHOMA

Drilling and shoveling contests among miners of the Miami district, with prizes ranging from \$10 to \$100, are to be held in July, during the Imaim Amohalko fiesta, under rules similar to those which prevailed last year.

Tough times in coal did not discourage the King Koal Karnival, which is held annually at Henryetta. This year it ran from July 1 to July 5, drawing people from many surrounding towns to see the street pageant and to enjoy the street carnival of the type that has been conducted in Henryetta each year for four years. Coal displays in store windows and special coal advertising of all sorts during the week helps merchandise the coal produced in the Henryetta field.

### PENNSYLVANIA

The Westmoreland Coal Co. is preparing to develop a large tract of Pittsburgh coal recently purchased in Sewickley township, Westmoreland County.

Because mine workers at the Woodward colliery of the Glen Alden Coal Co., at Edwardsville, Luzerne County, closed down the operation to hold election of officers, district officials of the United Mine Workers may refuse to recognize the elected officers. Several fights occurred at the colliery during the day of election and arrests were made. An insurgent faction carried the election.

The Hazle Brook Coal Co. now has another colliery on its chain of operations. The new operation is located at Good Springs, near Maryd. The Skidmore and Buck Mountain veins have already been reached and fuel is being shipped.

A 5-ft. vein of coal was reported to have been struck last week in the No. 4 slope of the Evans Colliery Co. at Beaver Meadow, where Contractor Peter Ecker, of that place, is driving a tunnel from the Buck Mountain to the lower Gamma vein.

The Alliance Coal Co., a subsidiary of the Lehigh Coal & Navigation Co., is planning to install automatic controls on its pumps, as it has already done with its fans. These vital machines will be handled by one man, who will control them by means of a gage located in a substation on the surface.

That advertising urging the installation of special grates for the burning of small sizes of anthracite coal brought results is evidenced by the reports of dealers in the anthracite region. In Freeland, Pa., in the heart of the hard coal region, agencies report a large sale of special grates. The Coxie Traveling Grate Company at Port Carbon is now working on a new small heating plant which will burn steam sizes of anthracite.

The Shamokin Colliery Co., a \$250,000 corporation of Boston and Wilkes-Barre capitalists, recently acquired from Daniel H. McGhee and Joseph J. Evans, of Shamokin, their colliery located about two miles west of Mt. Carmel. Matt Stevens, of Wilkes-Barre, is president and general manager of the new company, and Ernest P. Chapin is secretary and treasurer. The Shamokin company recently leased a section of coal land and some valuable culm banks just west of the new acquisition.

The Rochester & Pittsburgh Coal & Iron Co. is rebuilding the tippie of its Helvetia mine near Punxsutawney, which was burned last October, employing Heyl & Patterson of Pittsburgh to do the work. The cost is to be about \$50,000 and the tippie will be finished in two months, when the mine will start up.

### UTAH

Thirty-five prominent Salt Lake City business men met at the Alta Club one day recently where they gave a dinner in honor of L. F. Rains, head of the Carbon Fuel Co. The dinner was in recognition of Mr. Rain's part in developing the steel industry in Utah.

The U. S. Land Office will in the near future contest 20,000 acres of coal land in Emery and Carbon counties, claimed by the state as school sections. The national government contends the mineral character of the land was known prior to the date the state rights attached.

A coal tract comprising 1,818 acres in the Castlegate district has been let by the Register of the Land Office to L. A. Lawyer. It is one of the largest single units to be let in recent years. Under the terms of the lease not less than \$50,000 must be spent on bringing the property to an annual production of 60,000 tons of coal in three years. The government royalty is 10c. a ton.

### VIRGINIA

The Amherst Coal Co. and the Logan County Coal Corporation have consolidated, and the name of the latter will be used for the new firm. The Norfolk office will be in charge of H. M. Fadley, former manager for the Amherst Coal Co.

### WEST VIRGINIA

It having been established that the fire which resulted from the gas and dust explosions in the Benwood mine of the Wheeling Steel Corporation on April 28 has completely died out, the State Mine Department has recalled its corps of inspectors in charge since the explosion and the company is now preparing to resume operations in the mine. Men are at work clearing the motor road and placing new timbers along the main entry, which will require several months and will involve the expenditure of a large sum of money. An order has been promulgated to the effect that none but electric safety lamps shall be used by the employees at all mines of the corporation.

It is stated that ventilation at the Benwood mine at the present time is better than in any other mine in the northern Panhandle. Brattices and walls built on the aircourses and other changes made under state supervision insure a constant flow of air into all of the workings.

### WISCONSIN

Bertram M. Ainsworth, of Milwaukee, who skipped when his arrest was ordered for conspiracy and using the mails to defraud in the Valley Coal & Dock Co. bankruptcy case, was captured by the police in New York City, June 25, and has been returned to Milwaukee for trial. Ralph Clements, of Cleveland, the other operator of the Valley company, surrendered some time ago and is out on bail awaiting trial.

### CANADA

T. H. Williams has been appointed manager of the Reserve Mine, Western Fuel Corporation of Canada, to succeed Robert Henderson, resigned.

The Toronto Board of Health has let the contract for the anthracite required for the building under its control to W. Scott & Co. at \$15.50 per ton. There were six tenders for the contract, all of which quoted the same figure.

On June 20, the first box of coal was raised from No. 1 B, the newest and best equipped colliery of the Dominion Coal Co. at Glace Bay, N. S., which has cost nearly \$3,000,000. It has a normal capacity of about one million tons yearly. No. 1 B is exclusively an undersea mine, but how far under the Atlantic it will be possible to continue the extraction of coal will depend on how far ventilation can be economically developed.

The Canadian Collieries (D), Ltd., is opening a new slope in the Bright district, Vancouver Island, on the outcrop of the Wellington seam. It will be operated as an extension of the Wellington Ladysmith Colliery. The same company is unwatering No. 8 shaft, Cumberland. This development was carried out in the year 1914 and was stopped to permit concentration of production from other workings.

At the annual meeting of the Nova Scotia Mining Society at New Glasgow, N. S., on June 24, President Alex. McNeil, general superintendent of collieries for the British Empire Steel Corporation, in his presidential address emphasized the necessity for an increased duty on coal. He contended that if Nova Scotia was to compete with American coal in the markets of Quebec and Ontario the cost of production must be lowered and freight rates decreased.

### New Companies

The Standard Fourth Vein Coal Co., of Linton, Ind., has been capitalized with 5,000 shares of no par value stock to mine, sell and ship coal and coke and other minerals. The incorporators are G. B. Taylor, of Erie, Pa., C. F. Shepard, of Ladd, Ill., and Peal Poole, of Linton, Ind.



## Traffic News

### Rate Cuts Allowed, Advances Denied in Kansas

The Kansas Public Utilities Commission has issued an order reducing freight rates on coal from southeastern Kansas to points in the central and western parts of the state. Some time ago the railroads filed an application for authority to increase some rates and lower others on joint line hauls of coal from the Kansas field. About 200 towns were affected. The commission denied the application to increase the rates, but allowed the railroads to make the reductions they proposed. The reductions amount to from 10c. to 25c. a ton. The Santa Fe, Katy, Rock Island, Union Pacific and the Frisco are the railroads involved.

### North Dakota Not to Call Parley On Lignite Rates

The North Dakota State Railroad Commission will not call any conference for the purpose of considering new lignite rate tariffs, Frank Milhollan, chairman of the commission, said last week after an announcement had been made that the South Dakota commission was considering such action. The North Dakota commission which recently dismissed the complaint of railroads for higher lignite tariffs, takes the position that as the proposals for increased rates were instituted by the carriers, the burden of proof naturally fell upon them and if there is to be any conference of interested parties it would be up to them to take the initiative, Mr. Milhollan said.

### B. & O. Must Pay Damages In Coke Rate Case

The Interstate Commerce Commission in a formal report in the case of the Pittsburgh Steel Co., against the Baltimore & Ohio R.R. and connecting lines held that the rate on coke, in carloads, from Cascade, W. Va., to Monessen, Pa., between June 10 and June 20, 1923, were unreasonable. The complainants were awarded \$7,789 with interest as reparation damages.

### Decision on C. C. & O. Lease May Be Deferred

Decision of the Atlantic Coast Line and the Louisville & Nashville as to whether or not they will accept the Carolina, Clinchfield & Ohio lease under the terms laid down by the Interstate Commerce Commission may not be definitely decided for several months, according to a report last week. Since the order was handed down by the Interstate Commerce Commission thirty days ago, counsel for the railroads concerned have been making a careful study of the situation, but have not made a report. Under the terms of the order of the Interstate Commerce Commission the Atlantic Coast Line and the Louisville & Nashville will have six months in which to make their decision.

### Assigned Car Case Deferred Again

The Interstate Commerce Commission announced on July 5 the tenth postponement of the hearing on distribution among coal mines of privately owned cars and cars for railroad fuel until Nov. 1, 1924. A hearing had been set on the last postponement for August 1.

### Indiana Rate Cuts Hold

An injunction which nineteen railroad companies operating in Indiana sought in a suit filed in March to prevent the Indiana Public Service Commission from enforcing a schedule of rates which the commission approved in February on coal shipments from producing points to different group destinations, all in Indiana, has been denied by Judge Hay, in Superior Court, in Indianapolis. The court said there was no evidence to show the proposed rates would not be sufficient to produce an adequate return, including a reasonable profit, or that the rate would force the reduction of any rate, either interstate or intrastate, below such a level. The railroad companies, in their suit, alleged the schedule of rates was too low to yield a fair return.

Petitions asking lower freight rates on coal from certain Indiana points have been filed with the Interstate Commerce Commission against the Chesapeake & Ohio and other railroads. Rates on coal from Ohio, West Virginia and Kentucky to Elkhart, Ind., have been lowered, the petition states, and adjustment of eastern rates is asked.

## Obituary

Maynard O. Gibbs, mining engineer and former well-known resident of Bluefield, W. Va., was killed a few days ago by a fall of slate in the No. 10 mine of the United States Coal & Coke Co. at Gary. The room in which Mr. Gibbs was killed had been regarded as dangerous for some time and Mr. Gibbs was warned as to its condition before he entered it. During the world war Mr. Gibbs served overseas. Returning to the United States in 1919, he obtained a position with the United States Coal & Coke Co. at Gary as a mining engineer. Mr. Gibbs was graduated from the Virginia Polytechnic Institute, at Blacksburg, as a civil and mining engineer. He was about thirty-two years of age and is survived by his wife and one daughter, aged six years.

## Coming Meetings

**First International Management Congress**, Prague, Czechoslovakia, July 21-24.  
**Rocky Mountain Coal Mining Institute**, Summer meeting, Aug. 7-9, Rock Springs, Wyo. Secretary, Benedict Shubart, 521 Boston Bldg., Denver, Colo.

**New York State Coal Merchants Association, Inc.**, 14th annual convention, Sept. 4-6, Stamford-in-the-Catskills, N. Y.; headquarters Churchill Hall. Executive secretary, G. W. F. Woodside, Arkay Building, Albany, N. Y.

**National Safety Council**, Thirteenth annual safety congress Sept. 29 to Oct. 3, Louisville, Ky. Managing director and secretary, W. H. Cameron, 168 No. Michigan Ave., Chicago, Ill.

## New Equipment

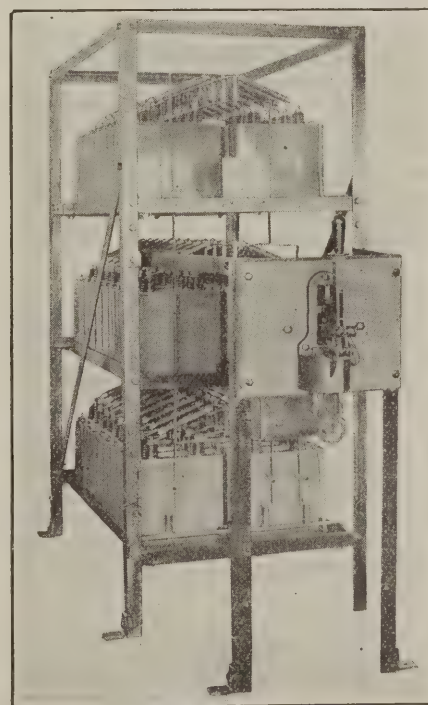
### Power-Factor Correcting Unit

A static condenser of an improved design, said to be durable, efficient, of light weight and low cost per kilovolt-ampere, is now on the market. This device is designed to enable industrial concerns to improve the power factor of their electric circuits and thus increase the available capacity of their generators and transformers, decrease the energy losses in their distribution systems and improve their voltage regulation.

A specially high-quality dielectric is used by the manufacturers of this device, enabling them to cut down the thickness of the layers without reducing their efficiency, thus reducing the size and weight of the condenser.

Among other advantages claimed by the General Electric Co., who markets this condenser, are efficiency, simplicity of operation and convenience of location. No attendant is required, the condenser being placed in operation by closing a control switch. It may be left on the line indefinitely with but occasional inspection. Operation is claimed to be practically noiseless. The condensers may be designed for out-of-door service. There are no moving parts, thus eliminating the need for a special foundation.

Low losses are also a feature of this device, the losses in 2,300-volt equipment being approximately one-half of one per cent of the rated kilovolt-ampere capacity. For low-voltage equip-



Static Condenser Unit

This is a three-phase, 60-cycle, 180-kva. 2,300-volt static condenser. Power-factor correcting equipment will increase the kilowatt capacity of transformers, lines, and switches. Power savings are also possible because of the lower heat losses.



ments, a transformer is included, the losses being approximately 3 per cent.

The improved condenser consists of a number of units, a reactance for dampening out the higher harmonics in the voltage wave, a discharge resistance for draining the condenser charge when disconnected from the line and an oil circuit breaker for the control of the equipment. The number of condenser units is directly proportional to the capacity required. Each unit is composed of a large number of couples of metal-foil paper laminations as a dielectric. These units are mounted on a rack.

The condensers are being marketed for 40- to 125-cycle circuits, of 220 to 2,300 volts, in six sizes from 30 to 300 kva. For larger capacities, the complete units are arranged in tiers or banks. The weights of the standard units, without reactor and transformer, range from 805 lb. for the 30-kva. size to 5,510 lb. for the 300-kva. size.

### Cable Connector with Enclosed Fuse

The Ohio Brass Company of Mansfield, Ohio, has developed a device known as a fused cutting-machine connector, made in any amperage for use on 250- and 500-volt circuits. The connector is of an unusual design, arranged so that it can be easily attached to the machine circuit or the trolley wire simply by turning the handle, this having a tightening effect on the clamp and giving a contact surface of about 3 in.

In cases where the connector is attached to the trolley wire it allows sufficient clearance for the locomotive to pass under it without removing the connector from the wire. Another rather convenient feature is the fact that in cases where it is necessary to run the mining machine cable under the track a plug connection at the end of the connector can be removed, thus eliminating the necessity of cleaning under the track sufficiently to allow the whole connector to pass, this plug connection being just slightly larger than the diameter of the mining-machine cable.

The connector is of rugged construction and is unaffected by moisture. The case is of the highest grade bakelite and the metal parts are of a high grade bronze, thus insuring proper insulation and maximum current-carrying capacity. A large disk on the handle prevents the operator's hand from slipping onto the metal parts that are not insulated.

The connector is equipped with a Trico fuse link and a case, thus insuring long life to the fuse compartment—eliminating practically all carbon de-

posits from the inside of the case and the possibility of leakage. The fuse case is so arranged that the machine operator cannot easily insert anything but the proper fuse.

The connector can be attached to the mining-machine cable with little or no expense by simply soldering the charged side of the cable into the lower plug terminal of the connector. It is also arranged with a glider to be used when traveling from one cutting place to another. The head of the clamp is drilled to receive a 4/0 wire, the wire being held into the connector by a set screw, thus making it easy to replace the glider. The fuse case is properly ventilated, eliminating the possibility of its exploding in the operator's hand.

Expensive mine fires are frequently caused by mining-machine cables becoming so greatly overheated that they cause fire. There is in general use today an all-rubber insulated mining-machine cable, which being expensive might well be given the protection that this cutting-machine connector will afford.

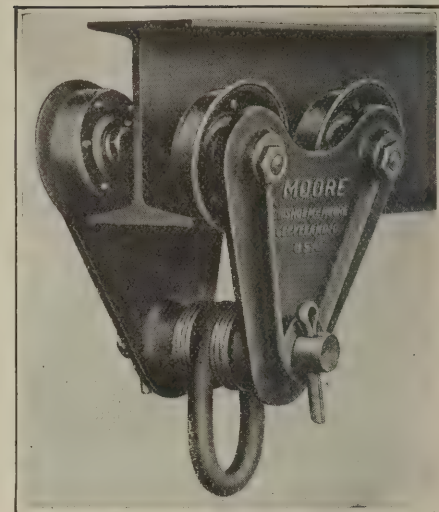
This connector also protects the mining machine and the machine operator. It eliminates the line contact made by the rather crude hook, which has been used for so many years. Compensation laws require a fused connection on the end of trailing cable and if such a connection is not used the mining company is liable to an increased charge.

### Trolley with Ball-Bearing Pressed-Steel Wheels

A new trolley, the distinctive feature of which is that it has ball-bearing pressed-steel wheels, has been brought out by the Chishold-Moore Mfg. Co., Cleveland. The bearings are built in the wheel during its manufacture, so that the wheel and its bearings form a complete unit. The wheel is of 3-in. diameter and has a  $1\frac{1}{8}$ -in. tread.

The side frame is of steel and has an oscillating feature to distribute the load on all four wheels and thus assure positive traction. By the shifting of washers the trolley may be used for 4- to 7-in. I-beams and by the use of special separators it can be operated on larger beams. A hoist with swivel connection when hung from this trolley can swing a complete circle. When an I-beam is closed at both ends the trolley may be installed quickly by removing the equalizing pin shown in the lower part, thus separating the two side frames.

It will be noted that the trolley is simple in construction and convenient to install. It weighs only 17½ lb. complete. It is made at present in one size to handle loads up to 1 ton.



**Adjustable Hoist Trolley**

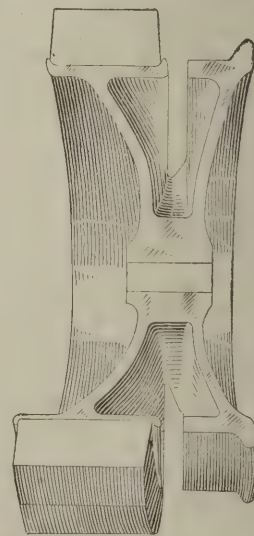
Ball-bearing wheels with bearings built into the wheels makes this trolley operate easily even under full load. This makes it an ideal outfit for machine shops and store rooms.

### Wheel with Double Tread

A wheel designed with a double tread to run on rails or flat surfaces is being manufactured by the Vulcan Iron Works, of Wilkes-Barre, Pa., for sale by the Griffin Double Tread Wheel Co., 27 William St., New York. The illustration shows the wheel with a section cut out. It is made in the usual diameters and weights depending upon the service for which it is to be used.

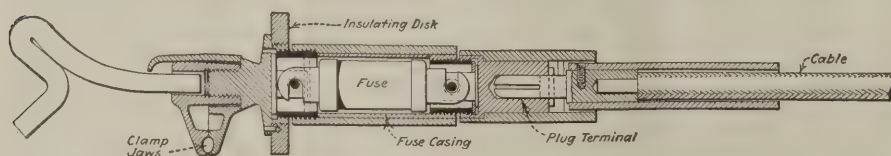
This wheel can be made from open-hearth steel or chilled steel made by the Griffin process. The manufacturers claim that the sections can be made as thin as the ordinary wheel and yet have sufficient strength.

On specially designed trucks, brakes may be applied to bear directly on the metal surface of the inner or rail tread. The flat large diameter tread is covered with a rubber tire. By the use of this wheel, it is easy to transfer from a rail to a floor or vice versa.



**Wheel for Operating on Rail or Flat Surfaces**

Wherever the distance between the top of the tie and the top of the rail is sufficient, this wheel can be used on either rails or flat surfaces. Such a wheel will no doubt find application in mine repair shops and foundries.



**Special Protective Connector for Mine Cables**

Many of the more serious delays to electric equipment in the mines are due to mining machine and drill machine cables being grounded. This clamp is designed so that an efficient connection can be made to the trolley wire. A fuse in the handle protects the equipment working from the cable circuit and also eliminates dangers to the workmen.



# COAL AGE

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Devoted to the Operating, Technical and Business  
Problems of the Coal-Mining Industry

R. Dawson Hall  
Engineering Editor

Volume 26

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Number 3

## Fourth Annual Model Mine Number

NONE of the bituminous coal companies of the United States can lay claim to producing more than 3 per cent of the country's output of soft coal. The Glen Alden Coal Co., however, during the year 1923, produced somewhat over 10 per cent of the total output of the anthracite region, thereby supplying approximately 800,000 families with domestic coal in addition to furnishing steam coal for numerous industries throughout the eastern and middle western parts of the United States. Nearly twelve miles of railroad cars are shipped daily from its various operations. It normally carries 20,000 names on its payroll.

The Glen Alden Coal Co. began operations as a successor to the Delaware, Lackawanna & Western R.R. Coal Department on Sept. 1, 1921, at which time W. W. Inglis, who prior to that time was vice-president and manager of the Delaware, Lackawanna & Western R.R. Coal Department, was made its president, and Shelby D. Dimmick, who prior to that time was assistant to the vice-president and manager, was made its vice-president and general manager.

The property of this company is situated within Lackawanna and Luzerne counties, there being seven collieries in each county. Tributary to these fourteen collieries are many mines which, in years gone by, were separate and distinct operations. By consolidating a number of local collieries into one, the Glen Alden Coal Co. has effected appreciable economies. Of these fourteen collieries, four during the past year produced over one million long tons of coal each.

At the present time, twelve separate coal beds are worked by the Glen Alden company, the number operated by the various collieries ranging from three to eleven. The number of mines tributary to the different collieries of this company, the number of beds worked at each colliery and the revenue output produced by each during the year 1923 are shown in the table.

Naturally a company of this size arouses no little interest as to its methods of operation. As little has hitherto been written, *Coal Age* in this number gives a general review of this property, elaborating on the Baker Colliery which is its most modern and important development.

To those who have been associated with the anthracite field sufficiently long to observe the

changes that have taken place in this industry' modern equipment like the Baker Colliery will be recognized readily as being as much a revolution in anthracite mining as is the modern trans-Atlantic steamer from the sailing vessel that plied the ocean lanes when the anthracite industry was at its beginning.

Much has been said by the newspapers of the country during the past ten years regarding the constantly rising price of coal. Little do the readers of these periodicals appreciate the fact that were it not for such modern equipment as is typified by the Baker Colliery, the prices of anthracite would be far beyond the figures now made necessary by constantly increasing labor costs and the growing difficulty of mining. The Glen Alden Coal Co. is a pioneer in the electrification and mechanization of coal properties. Its progressive policies have fully justified its selection of this periodical for treatment in its fourth annual model mine number.

The officers of the Glen Alden Coal Co., to whom credit for its progressive operations is largely due, are: W. W. Inglis, president; Shelby D. Dimmick, vice-president and general manager; G. N. England, secretary and treasurer; James Dodson, assistant secretary and treasurer; Bradford Samson, assistant to the vice-president and general manager; Charles R. Seem, electrical engineer; N. N. Nichols, chief mining engineer; Charles St. John, mechanical engineer; Frank Hildebrand, auditor; J. N. Shaw, purchasing agent; and J. H. Oliver, general counsel. John R. James is the colliery superintendent of the district tributary to Baker Breaker.

Glen Alden Output and Where It Comes From

County	Colliery	No. of Tributary Mines	No. of Beds Worked	Revenue Output in 1923 in Long Tons
Lackawanna	Storrs.....	2	11	1,040,810
Lackawanna	Diamond.....	2	11	605,585
Lackawanna	Hyde Park.....	3	4	499,900
Lackawanna	Archbald.....	1	5	442,623
Lackawanna	Pyne.....	1	5	458,749
Lackawanna	Taylor.....	3	6	677,043
Lackawanna	Baker.....	2	8	759,772
Luzerne	Bliss.....	1	6	601,705
Luzerne	Halstead.....	1	4	163,786
Luzerne	Pettebone.....	2	6	638,247
Luzerne	Woodward.....	1	7	1,259,206
Luzerne	Avondale.....	1	3	299,669
Luzerne	Loomis.....	2	4	1,255,295
Luzerne	Truesdale.....	2	9	1,270,759
Total.....				10,182,769 or 11,404,702 short tons



## Do You Know or Merely Suppose?

**F**EW HAVE decided just how many men are needed in any one section of a mine or at any one mine to produce any given tonnage. At one plant the foremen and section foremen met and decided, with the assistance of the management, just how many men were needed in each of the major divisions of the mine. Comparisons between sections enabled a labor budget to be planned and, when it was decided, the sections were restricted to just that number of men. The number was not finally decided at a single meeting. It took two or three sessions and some discussion, but at last a labor budget was fixed, and the foremen were obliged to conform to it. The company found that it reduced operating costs immensely.

## The Public Generalizes

**O**NLY A CLEAR case is a good case. No one can clear himself effectually who needs a lawyer, an accountant and a mathematician to do the clearing. A maze of figures scares the public. That is why wise men leave figures out of their editorials. The public does not pick up the paper usually to make complicated calculations.

Our coal case has been complicated by the troubles of the retailers. As shown in another section of this paper the wages of wharfmen and teamsters in Boston have much more than doubled. The increase in wages of those employees in 1920 and 1921 outstripped the cost of living. Since then living costs have declined, but the wages of wharfmen and teamsters have not fallen in proportion.

The domestic consumer makes no fine distinction between mines, railroad and retailer. They are all one to him. It is a folly to forget that they are all part of the coal family. The railroads stand a little apart because they are not engaged solely in the transportation of coal. But the operator and retailer are in a real sense one. They come alike under the ban of the public when the public is displeased about coal. The retailer has a right to concern himself with costs and quality at the mine and the operator with costs of distribution and quality of coal as delivered to the consumer. Both also are interested in railroad transportation.

Lower costs to the consumer by the payment of reasonable wages, by efficiency, by a reduction in the wastes of competition are matters of interest to the whole industry. The excessive increases in wage in all three industries, due largely in the case of mining and transportation to government interference, has placed a burden on the coal consumer against which he is revolting. The operator should bear that fact in mind and let the public know that coal at the mine, coal on the railroad and coal in the delivery truck are, one and all, paying excessive wage bills.

The decline in the roadbuilding and house-erecting industries will probably correct this anomaly in the wages of wharfmen and teamsters before long and may make the consumer's bill a little lower, thus relieving the anthracite operator of some of the opprobrium that accompanies high prices. It is interesting to note what generous increases the wharfmen and teamsters have received as compared with those of the men in the building trades. The public too often overlooks the fact that the mechanic or alleged mechanic in the

building trade always has received wages above the average and consequently the present wages are relatively not much out of proportion to former wages, when the cost of living is considered. Even, at that, the wages of all construction men are due for a heavy decline.

## Electricity as a Simplifier

**W**HAT is said about the Baker breaker in regard to electricity is true not only of breakers but of the underground. The simplicity of that building is largely due to the absence of mechanical drives. In past generations the breaker was full of ropes, even today in a few breakers some still remain. They strain the structure, they shake it and they add somewhat to the hazards of operation. Furthermore they interfere with design.

Still worse would be the complication underground if the mine were operated by rope drives. We can hardly conceive of setting a hoisting engine at the top of a shaft to operate a tail-rope haulage underground. But this must be done if the mine is to be operated without electricity and all of four substitute plans are rejected, none of which are as convenient as the electrical method. A steam engine could be placed below ground at each level to operate a hoist. An air engine could be used for the same purpose, pipes being carried down the shaft. Compressed air at high pressure could be piped to a point underground and fed to a compressed-air locomotive, or animal power could be used.

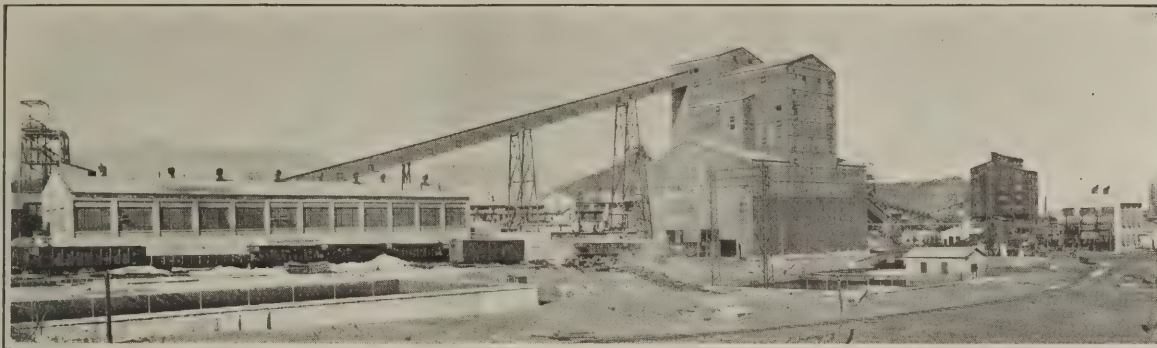
In some metal mines steam engines are placed below ground. Temperatures of 130 deg. are common. What it means, even in the dry air of Arizona, to work at such a temperature can be imagined. Fortunately only at odd times does a steam engineer actually have to work, but to stay in a place having such an excessive temperature is extremely enervating.

The loss in steam pressure in such installations is immense and the dangers of fires in any but a fire-proofed shaft is extreme, for not only is the heat for combustion provided by the pipes but the draft to fan any combustion into flame is also afforded. The loss of air pressure when an air-driven hoist is set below ground is deplorable and the pipes, that lead the air to it, must be of large diameter and thus cumbrous and space filling.

The compressed-air locomotive is more feasible and is used in some mines. Animal haulage is, of course, taboo. How feebly all these expedients compare with electricity as an agent for underground service! Nothing has been said as to pumps and auxiliary fans, but with them also the argument in favor of electricity is equally strong. In fact, electricity it is that is making compressed air underground feasible. The compressor is placed in the mine and is driven electrically. Thus, what compressed air can do best in the way of percussion and shovel operation it can be permitted to do, and it will not be hampered by difficulties of transmission.

Electricity has been the great simplifier of mine operations from face to breaker or tippie. Just think what a mess of ropes we would have if we tried to cut, load, transport as well as hoist coal by ropes and to pump by similar methods. A little consideration of this fact and it will be easy to understand why electricity has made such rapid strides. The mining industry above as well as below ground could not do without it.





General View of Storrs Colliery.

## Glen Alden Operates Three Longwall Faces with Conveyors in a Thirty-Inch Coal Seam

Mining Methods That Presage Company's Ability to Mine Thin Coal Whenever Big Seams Begin to Fail—Company Mines Eleven Seams but Not All at Every Property

BY FRANK H. KNEELAND

Associate Editor, *Coal Age*, New York, N. Y.

CONVEYOR mining methods are not new in the anthracite region whatever they may be in bituminous. The region that invented and fathered the scraper had conveyors many years before the West Virginia Coal & Coke Co. tried its experiments.

Little has been said about the Glen Alden Coal Co.'s face conveyors and longwall methods. Most persons believed the company had stuck uncompromisingly to room-and-pillar workings, electric and mule gathering methods, chutes and full batteries. But the Glen Alden has been doing a little pioneering of its own in hunting for a way to mine thin coal to maintain its large output.

Just a word about the seams in the Glen Alden mines prior to a description of its mining methods. In Lackawanna County the beds worked are as follows: The 8-ft. or Olyphant No. 1, the 5-ft. or Olyphant No. 2, the 4-ft., the Diamond, the Rock, the Big or 14-ft., the New County or Marcy, the Clark, and the Dunmore Nos. 1, 2 and 3. In Luzerne County the beds worked include: The No. 5, the Snake Island, the Abbott, the Mills or Kidney, the Hillman, the Baltimore, the Forge, the Twin, the Ross and the Red Ash. In some operations some of these beds are divided forming two or more workable measures. Thus in some localities the Baltimore bed is split into an upper and a lower measure called respectively the Cooper and the Bennett beds.

The thickest coal now worked occurs in the Red Ash bed at Avondale, but the Baltimore bed at Bliss colliery is about equally thick. The thinnest coal is found in the Dunmore No. 1 and New County beds at Diamond colliery, the thickness of these measures being about 30 in. Beds of this thickness cannot, under present conditions, be worked by themselves at a profit. It is

only when such measures occur near thicker coals that can bear a portion of the expense of their operation that it is permissible to mine them.

In most places the coal beds worked are both overlaid and underlaid with hard rock which renders either the brushing of top or the lifting of bottom difficult and expensive. The coal pitches at all angles from horizontal to vertical. On the other hand, considering the reflex folding of the measures, it is often said that the pitch is more than 90 deg.

The methods of mining in any section of the mines vary greatly with the pitch of the measures at that point. As a rule the coal is mined by room-and-pillar methods. On pitches not exceeding 15 to 18 deg. cars are taken to the room faces by means of room hoists. On steeper pitches varying from this inclination up to about 40 deg., sheet-iron chutes are employed. On steeper slopes coal is broken down into full batteries or rooms. In low flat beds the Strange scraper serving three to five rooms is being used with much success.

At the Dodge slope of the Baker colliery an undercutter is in use in conjunction with a face conveyor. This mining machine makes an undercut 5½ ft. deep on a continuous face 220 ft. long which constitutes approximately a full shift's work in this coal. In the bottom at this point are small hummocks or knobs that the cutter bar encounters. These make cutting difficult. Machines have never been used in these mines on grades exceeding about 5 deg. Scrapers, however, have been employed on pitches up to 20 per cent.

In shooting coal it has been found best to follow the directions of the explosives' manufacturer. On the other hand the miners insist on doing about as they please. Actual practice with the use of explosives therefore varies greatly with conditions. Under ordinary circumstances the miner shoots the face of his chamber much as a contractor blows the face of a rock

NOTE—The reader will not fail to observe the multiplicity of buildings and other structures including reservoirs in the illustration of the Storrs Colliery, which forms the headpiece of this article. Hard coal as it comes from the mines is not salable; it must be manufactured or as it is commonly expressed "prepared for market."



tunnel except that fewer holes are used. In most cases four shots are enough to bring down a face. The coal is more or less distinctly stratified and some vertical-cleavage faults and slips are also present.

Much coal drilling is being done by hand percussive drills of the jackhammer type. These are purchased by the miners and paid for in monthly installments deducted from their wages.

Coal is mined in almost every instance by room-and-pillar methods, the rooms being normally driven from 20 to 30 ft. wide depending upon local conditions. Wherever possible all unburnable material is left in the room. Sometimes, however, it is cheaper to bring it to the surface than to stow it underground.

As a rule central compressor plants are installed on the surface, and the air is piped underground to the point of use. Small local air compressors, electrically driven, are also sometimes installed underground. Air lines from central plants are seldom over 4,000 to 5,000 ft. long. Screwed joints in such lines are red-leaded and are kept tight by frequent inspections.

In all recent mining operations ample pillars have

able intervals. When the point is reached where it is desired to start a longwall face a "doghole" 16 ft. wide is turned from the side of the entry away from the aircourse. Coal is shot from the solid until the recess is 10 ft. deep. The undercutter is then put into the place thus formed and successive cuts taken until the doghole has been advanced to a depth of 35 ft., the coal meanwhile being reshoveled to the gangway.

The head and tail sections of the conveyor are next connected up in the doghole and succeeding cuts conveyed to the gangway. At every third cut a section of conveyor is added to that already in place. This is installed next to the takeup section. That is, at every third cut the takeup section is disconnected and drawn back to the face and another length of plain conveyor put into place between it and the rest of the conveyor already in position. In this manner the face is advanced until the doghole has attained a depth equal to the length of longwall face desired.

In this mine three such faces are at present worked—one 220 ft. long, another 175 ft. and the third about 160 ft. As the operation of all is exactly similar,



FIG. 1  
Conveyor  
Discharge

This shows the delivery end of the coal conveyor extending from the side of the heading over a partly loaded mine car. The coal cutter also appears in the position it occupies at the end of its face cut. The timbermen turn this machine sidewise, that is, lengthwise of the face and utilize its power in pulling the conveyor over to its new position. The undercutter thus serves two purposes.

been left to insure adequate surface support. The width of pillars is increased with the depth of bed worked.

In the second mining of flat beds, the pillars are usually drawn by men working at their inby ends. The pillars in the beds which pitch heavily are removed either by skipping or by splitting. Where the pillars are wide they are split and the pillars on either side are worked at such an angle that the coal will flow toward the center of the split. Where the pillar is not wide, skipping replaces splitting.

Reference has already been made to the mining machine and conveyor workings in the Dodge Slope. The average thickness of the coal worked at that point is 30 in. As the method employed in extracting this bed is peculiar to this mine a somewhat detailed description of it is perhaps justified.

To begin with, a 16-ft. main entry is driven in the coal. Parallel with this main entry and separated from it by a pillar 12 ft. thick a ventilation entry or air-course is driven. This entry is made 12 ft. wide with 12-ft. crosscuts between it and the main entry at suit-

attention in this description will be confined to the 220-ft. face. The number of shovelers employed and the tonnage of coal produced will depend, of course, directly upon the length of face worked.

When the doghole has been driven to the desired depth a slabbing cut is taken by the mining machine along the entire length of its inby rib, this cut being made from the inner to the outer end. The coal is then shot down and loaded onto the conveyor which delivers it to cars on the entry.

After a slabbing cut of this kind has been loaded out the timber gang comes in. This gang consists of a chargeman or miner and four laborers. They first turn the coal cutter, which has been standing beside and parallel with the entry, into a position parallel to the new face and close to it. A hitch is then taken on the conveyor with the main or lead rope or chain of the machine. The delivery end of the conveyor is thus pulled over 5½ ft. toward the coal by means of the machine. The men, however, assist in this operation by using crowbars at various points along the conveyor.



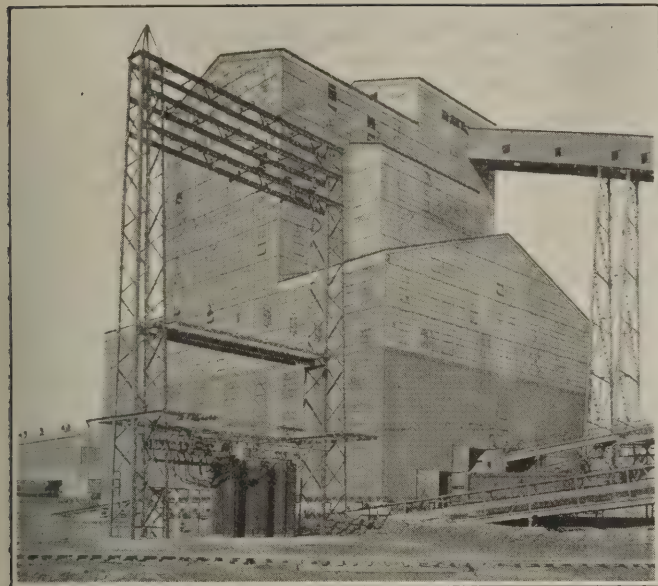


Fig. 2—Storrs Breaker, Glen Alden Coal Co.

Steel, concrete and glass are the accepted materials of breaker construction today. This is also true of most other mine buildings. Note the transformers and the transmission tower in the foreground. Electric current has practically supplanted all other means for energy distribution except for short distances, where belts are often employed.

The coal cutter is then moved (under its own power) back along the face for a distance of about 55 ft. and another hitch taken on the conveyor. This operation is repeated four times or until the coal cutter has been moved to the inner end of the coal face and the conveyor has been pulled into its new position and properly lined up about 7 ft. from the face.

The conveyor is now started but with its direction of travel reversed, that is with the upper strand moving inward or away from the entry instead of outward toward it. Round timbers in lengths of 4 ft. are next loaded into the conveyor from cars on the heading. These are removed from the conveyor at intervals along its length and laid to one side to be used in building cogs for roof support. About five mine-car loads of this cog timber and one carload of props are needed for each 5½ ft. advance of the face.

After enough timber has been spotted in this way, cogs are built, three timbers to each layer, on 8-ft. centers in a direction parallel with the face and on 5½-ft. centers in a direction at right angles to it. Props are set alternating with the cogs in the rows parallel with the face, except that no props are set immediately beside the heading. On the side of this passage, therefore, single cogs alternate with double ones. The entire arrangement is shown in Fig. 3.

After cogs and props have been put in place and securely wedged against the roof the machine runner and his "kailer" or helper, begin the new cut at the inner end of the face. This is made in a small parting that occurs in this bed about 6 in. from the bottom. A miner follows the machine setting props, usually about 6 ft. apart but closer if roof conditions require. This row of props is about 5½ ft. from the face.

Another miner and his helper follow the prop setters drilling and charging the shotholes necessary to bring down the coal. These are usually about twenty-two in number. They are made 1½ in. in diameter and 5½ ft. deep. Each is loaded with 2½ sticks of 1-in. Red Cross low-freezing dynamite. Just enough tamping is used to hold the charges in place.

On this 220-ft. face thirteen loaders are employed so that each has about 17 ft. of face to clean up. Inasmuch as the places near the far end of the conveyor are preferred to those near its discharge end (because the conveyor is loaded progressively from its rearmost end to the heading and because the man at or near the farther end, having an empty or nearly empty conveyor to shovel into, can clean up his allotted 17 ft. of face somewhat quicker than the man near the heading who must shovel to the conveyor when nearly full) the men rotate in their positions from day to day. In other words they change places exactly as did the scholars in the old-time spelling class when nobody missed a word and he who was head of the class today took position at its foot tomorrow.

In coal as low as 30 in. the men necessarily must work on their knees. As a result the shovelers as well as all others employed on these long faces wear heavy knee pads made of short sections cut from automobile tires. These are almost ideal for the purpose and afford thorough protection from the small coal and rock on the floor. In addition, however, some wear secondary or auxiliary pads of cotton sewed to their trousers legs.

The shovels used in this low coal are nearly straight, the angle between handle and blade being very small. To be exact No. 3 scoops with No. 1 lifts are used. After the loose coal brought down by the regular shots has been loaded out a "plugger" or miner straightens out the face by shooting off any projections that may remain upon it. The shotholes drilled in this work are

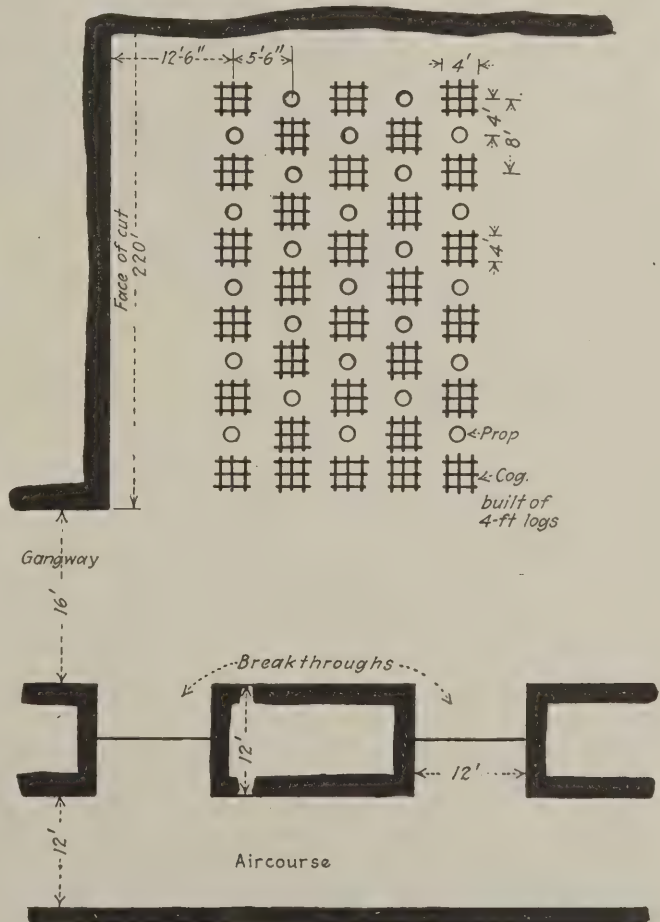
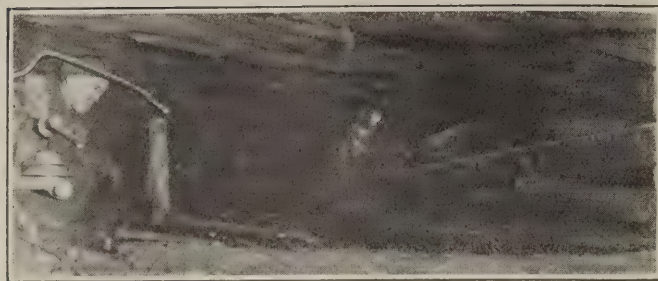


Fig. 3—Diagram of Longwall Face

This diagram, necessarily, is not drawn to scale. With a heavy brittle cover, roof support is the great problem encountered. Cogs and props are used in abundance and together control the settlement of the roof as long as necessary for the safe extraction of coal from the face.





**Fig. 4—Shoveling to the Conveyor**

This picture was taken from the heading. It shows one of the shovelers on his knees loading coal into the conveyor. This conveyor consists of a low, shallow, flaring trough in the bottom of which a chain with low flights or crossbars is drawn along. Being built in sections it may be readily transported over either short or long distances.

seldom more than 2 ft. deep, and the charges of explosive used are correspondingly light.

At 2 p.m. the timber gang arrives, and the cutter is ready to start his machine by 10 p.m. The cut is usually completed about 4 a.m. The chain on the mining machine carries thirty-eight bits in seven positions. Bits are changed three times in making a cut.

**FIG. 5**  
**Truesdale**

This is one of the largest collieries in the anthracite region. Again note the many structures of varied type, yet all built of substantial materials.



Shortly after the machine has finished its cut the coal is shot down. The smoke clears away rapidly, and the work of loading out usually begins about 6 a.m.

All bone is left in the face by the loaders. The timber gang throws this material into the gob between cogs. A space 2 ft. wide is left between the conveyor and the face of the first row of cogs. Coal falling from the edge of the conveyor into this space is cleaned up by the loaders before they leave.

The loading crew consists of thirteen laborers who shovel to the conveyor, three men (miners) on the gang-

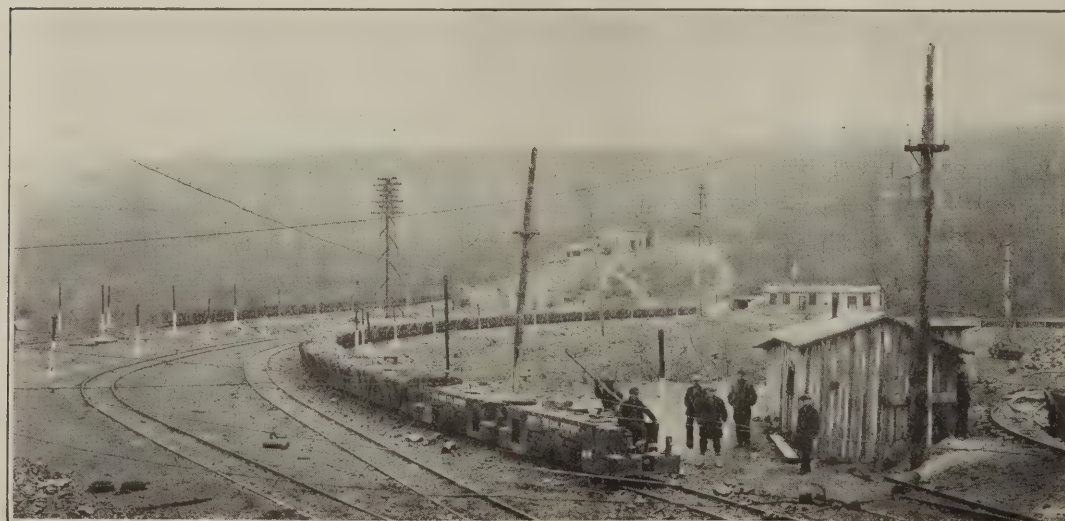
way and one plugger. One of the gangway men helps the plugger after the work has well started. The afternoon shift or timber gang consists of one miner and four laborers. The cutting or machine crew is composed of one machine runner, one helper or "kailer" and one miner who sets props after the machine. This crew is followed immediately by one miner and one laborer who drill, charge and blow down the coal. One foreman has general charge of all machine faces.

Every 5½-ft. cut on a 220-ft. face yields in coal of normal thickness about fifty-two mine-car loads. If the bed thins to any appreciable extent only fifty to fifty-one carloads are obtained.

When the longwall face on one side of the heading has been worked to its limit advancing, a second face is opened on the opposite side of the heading, and the coal on that side recovered in retreat. This second or retreating face necessarily extends across the aircourse previously mentioned. This, however, does not in any way interfere with operation.

Thus in brief has been described what is one of the most interesting mining methods in the entire anthra-

cite region. In an industry as inherently conservative as that of coal production success has not been attained without difficulty. And the obstacles encountered have not been confined to trouble from roof, floor, caving or machinery but have embraced the set habits of thought, the mental inertia of those engaged in the industry. The fact that this method of mining has been successfully adopted and that excellent team work now exists among the individuals and gangs employed speaks volumes for the zeal and perseverance of the officials who had the vision to perceive its possibilities.



**FIG. 6**  
**Sugar Notch**

A heavy articulated trolley locomotive taking a long trip of loads to the breaker. Glen Alden has approximately an aggregate of 500 miles of track at its mines under and above ground and an electric locomotive for each mile of track. A mining company as large as the Glen Alden Coal Co. has a trackage greater than some sizable railroads.





**Major W. W. Inglis**

*President, Glen Alden Coal Co.*

**S**HEER merit placed W. W. Inglis in the position of president of the Glen Alden Coal Co. In the undistinguished beginning of his career he was not a Glen Alden attaché, but an office boy for the Hillside Coal & Iron Co., an affiliation of the Erie R.R. He received the job April 1, 1884. By 1890 he was chief clerk, and in 1901 superintendent. Within a few short months, Sept. 15, 1902, he was made superintendent of the Pennsylvania Coal Co., an affiliated organization, but having more than twice as many mines and four times as many employees as the Hillside Coal & Iron Co. In 1909 he became superintendent of both companies and in 1913 he became general manager.

On Feb. 21, 1916, the Delaware, Lackawanna & Western R.R., reversing its general practice, went out of its organization to find a general manager for its coal department. Major Inglis was appointed to take complete charge of its properties. Since then he has become president and

the mines have become divorced from the railroad, the new company's name being the Glen Alden Coal Co. Major Inglis earned his title by service in the Pennsylvania National Guard and by active service in the Spanish-American War. Those who served under him recall with much pleasure the time spent under his command.

Major Inglis entered the business of coal production from the office, but let not that deceive anyone. Mr. Inglis is not deskbound in any sense. His delight is to follow out the details of mining and preparation; and the changes in methods of operation in the collieries under his control bear ample witness to the fact that he has the engineering problems of mining always before him, all the designs of the engineering department receiving his inspection and signature. He is "everlastingly at it" like the rest of his staff and finds nothing more pleasurable and inspiring than the task of making Glen Alden a profitable, economical, substantial coal property.





*Panoramic View of Baker Colliery*

**D**IN, DIRT, disorder and vibration formerly marked the anthracite breaker. The old-time coal breaker impressed and pleased the visitor by its size, but it appeared a sinister blot on the landscape and was an unpleasant place in which to work. It seemed almost a joke to describe it as a structure where coal was cleaned so grievously was it in need of that process itself. But modern methods of routing material have simplified this structure as they have the mills at the metal mines, and the modern breaker cleans and sizes coal so systematically and so simply and withal with such a little dirt and disorder that it can be entered without fear of soiling one's clothes.

The Baker breaker of the Glen Alden Coal Co. is kept as clean as a kitchen. The abundance of light makes it easy to ascertain just what results are being obtained. The old way of taking a handful of coal and carrying it to the uncertain light of a grimy window has passed with the age of darkness, and today it is easy to see the effect of each process at the point where it is performed.

#### ALL SIZES OF COAL CLEANED IN JIGS

In the Baker breaker the coal is crushed in a building near the ground level and then elevated to the top of the main building by means of a conveyor. Thereafter the coal passes by gravity through the various simple stages which convert it from a product of mixed size and mingled impurity to a carefully cleaned coal of eight sizes, all the grades, no matter how fine, being jigged free of impurity. The main rolls are placed on the ground level. Consequently the only vibration perceptible in the breaker is that due

NOTE—In the headpiece the foot house with the headframe may be seen on the extreme right. Next comes the long housed-in conveyor that may be seen leading to the top of the breaker. That the movement of material is an important operation at this colliery may be judged from the number of conveyors appearing in this picture.

## Baker—The Latest

Reaching the Breaker from  
on the Ground Level and the  
the Building—Simplicity and

to the jigs and shakers, and even this is reduced to a minimum by balancing; that is, by so arranging the equipment that the action of one machine, or part of a machine, tending to cause vibration in one direction is counteracted by another machine or another part of the same machine, which tends to cause vibration in an opposite direction. Sturdy construction and the use of separate drives for the larger units also do much to insure steadiness of the building.

Gone are the long ropes and the big driving belts that used to clutter and cumber the breaker, interfere with its rigidity and defeat any attempt to create order out of chaos. Electrical power is transferred from point to point by almost invisible conductors which can be made to follow the lines of the building and thus to perform their function without hindering the emplacement of machinery. The multiplicity of drives made possible by electric power has by the avoidance of synchronism made it possible to operate a breaker with minimum vibration. The old breaker was never a show place. The Baker breaker, on the other hand, is always in such order that it is ready for visitors. The attendant with his dust cloth and his O-Cedar mop sees to that.

Baker breaker is located on the outskirts of Scranton. It is a concrete, steel and glass structure throughout. In this breaker and adjacent buildings and structures a total of 4,773,800 lb. of structural steel and 44,666 sq.ft. of smooth wire glass were used. All machinery in the building is electrically driven, the larger units being fitted with individual drives and many of the





## Glen Alden Breaker

Several Sources, Coal Is Crushed  
Product Elevated to the Top of  
Neatness Foster a Good Morale

smaller machines or those requiring less power, such as the jigs, are driven in groups from line shafting. Steam from the boiler plant is used for heating, as may be judged from some of the accompanying photographs showing literally miles of pipe used in the heating coils. A small electrically-driven vacuum pump sucks the air from this heating system, and all condensate from it is collected and returned to the boiler plant.



Fig. 1—Trip Haul Feeding Cars to Dump

By means of this car haul the one man shown feeds the cars one at a time to the dump. The lever that the man is holding operates a friction clutch by means of which movement of the chain is controlled. This machine is driven by a motor in the small shed at the right.

Coal reaches the Baker breaker from several separate sources, namely: From the Dodge shaft, (1 on the flow sheet, Fig. 2), from the Bellevue slope (2), and from the Bellevue shaft (5). Coal from the Dodge shaft is brought to the loaded yard in trips each of about forty cars by electric trolley locomotives. Here it is joined by coal from the Bellevue slope which has been hoisted in trips each of four cars.

When a locomotive arrives in the loaded yard with a trip from the Dodge shaft it uncouples from its trip and shifts to the loaded track whatever loads from the slope may be waiting, returning any empties from the slope that may be ready. Cars from these two sources are of slightly different design, one end-gate of the slope cars being a little higher than the corresponding end of the shaft cars, so that they easily may be distinguished and switched to different empty tracks. After properly placing these cars, both loads and empties, the locomotive is coupled to a trip of shaft empties and returns to the mine with them.

An electrically driven tripmaker (3) feeds the loaded cars to the steam dump (3a) which discharges to a chute leading to the dragline conveyor (4). The tripmaker or car feeder (3) as may be seen in Fig. 1 consists of a strand of chain provided with lugs engaging the cars on the loaded track. This chain is driven through back gears and a friction clutch by a 50-hp. induction motor operating at 600 r.p.m. By manipulating the friction-clutch lever, therefore, the dumpman may feed cars to the dump as slowly or as rapidly as he pleases. About 600 cars are passed over this dump daily.

After being discharged on the steam dump (3a) the cars pass through a kickback and gravitate to the empty yard. As previously stated cars from the Dodge shaft are switched to one track and those from the Bellevue slope pass to another. Cars hoisted from the Bellevue shaft discharge to the same chute, (4a),



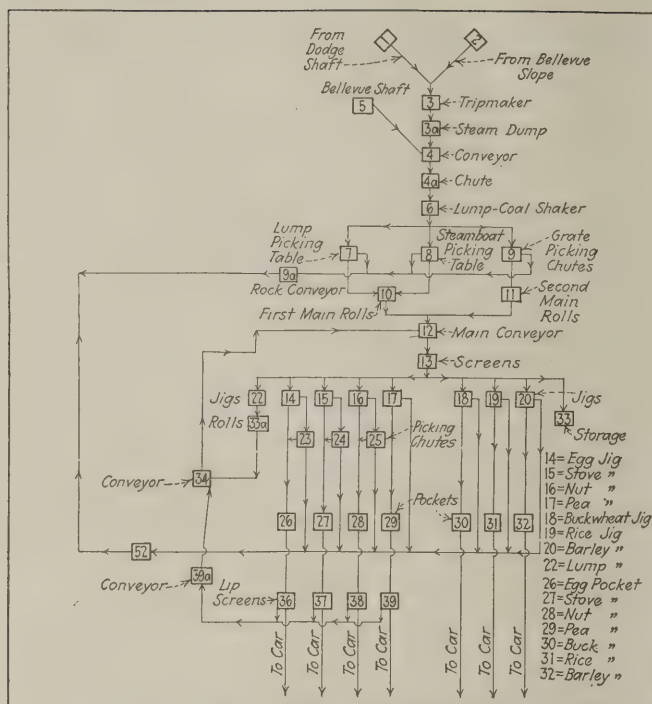


Fig. 2—Flow Sheet of Baker Breaker

This diagram is intended to show the origin and movement of the coal. It is strictly diagrammatic no attempt having been made to show anything other than the sequence of operations through which the coal passes.

that receives the coal from the conveyor (4). This chute leads to the foothouse.

Within the foothouse coal from all three sources (the Dodge shaft and the Bellevue shaft and slope) is discharged to the lump shaker (6). This machine is of somewhat unusual construction. It consists of two real and one false deck. That is the upper deck is short and unperforated and serves only as a reciprocating feeder to the other decks. This shaker separates the coal into three sizes, into lump, into steamboat and into grate and smaller.

From this shaker the lump passes to the lump picking table (7). The steamboat size likewise passes over a picking table (8), and the smaller coal is picked in the chute (9). Rock separated from the coal on the picking tables or in the chute is thrown into the rock conveyor (9a) discharging to the rock conveyor (52) leading to a conveyor (53 not shown) by which it is discharged to the dump.



Fig. 3—Drive of Conveyor to Foothouse

The head sprocket is driven by gearing from both sides. As may be seen all dangerous moving parts are thoroughly boxed and railed in, protecting the workmen from getting caught and being injured. Glen Alden believes in safety as well as neatness.

From the picking tables (7) and (8) the coal goes to the first main rolls (10). These are the largest in the anthracite region measuring 60x60 in. They are shown in Fig. 4 and are belted and backgeared to a 75-hp. motor that also drives the picking tables. These latter are of the pan-belt type, 4 ft. wide and set on an inclination. Grate coal from the picking chute goes through the second main rolls (11).

#### WHEN CRUSHED ALL COAL GOES TO TOP OF BREAKER

After crushing, coal from both rolls as well as the smaller material that is bypassed around them, goes to the main conveyor (12) leading to the breaker. This conveyor is of the dragline type, 5 ft. wide. It is driven from the top by a 300-hp. motor through a silent chain and a double spur-gear reduction. This motor and driving mechanism is shown in Fig. 5.

At the top of the breaker the coal is discharged from the main conveyor onto the screens (13). Here it is separated into the various market sizes, the egg passing to the egg jig (14) the stove to the stove jig (15) and so on, the barley jig being (20). Each jig is provided with a storage hopper or reserve pocket, assuring a

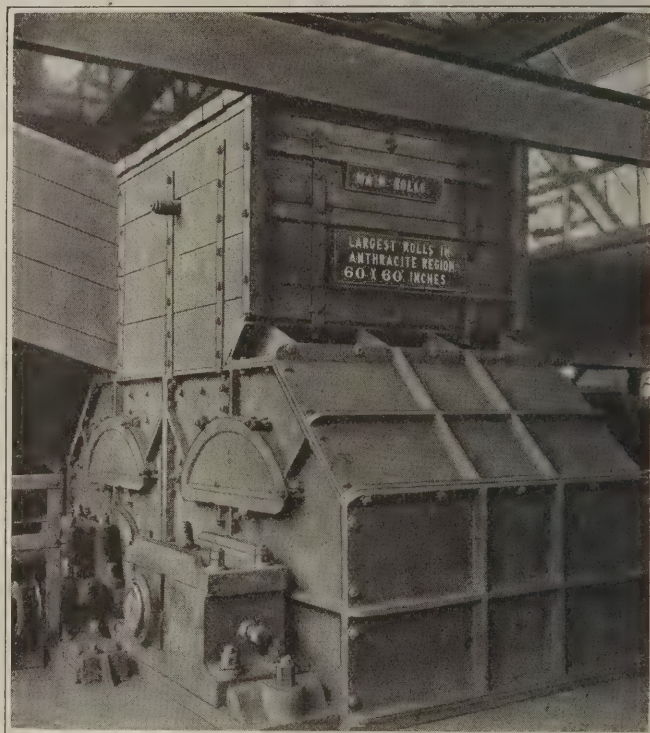


Fig. 4—Main Rolls in the Foothouse

These are the rolls that crush down the larger lumps. A smaller set of rolls located near them crushes the smaller lumps while coal of egg size and smaller is bypassed around both sets of rolls. To send coal already small enough to be marketable through rolls would result in needless degradation.

supply of coal to the jigs at all times. Buckwheat No. 4 is sent to the storage (33) and is ultimately sold for the manufacture of briquets.

Oversize coal or that larger than egg is first passed through the oversize jig (22) and then through the crusher (33a) whence it is sent back to the main conveyor (12) by way of the conveyor (34). Refuse from the egg, stove and nut jigs is hand-picked in the slate chutes (23), (24) and (25), the good coal being thrown into the chutes leading to the pockets. Refuse from all jigs passes to conveyor (52) going eventually to conveyor (53) which discharges to the rock dump.

From the jigs the coal goes to the pockets (26) to



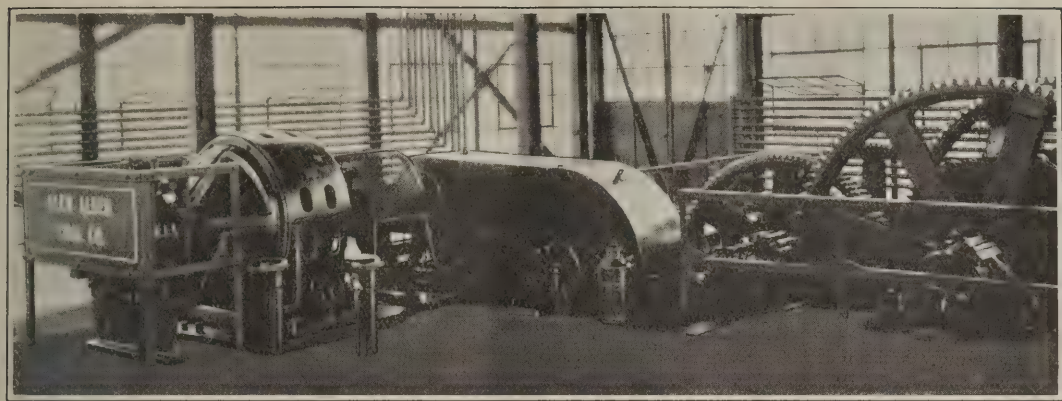


FIG. 5  
Main-Conveyor  
Drive

This is the conveyor that brings the coal to the top of the breaker. The first speed reduction from the motor is made by means of a silent chain; succeeding reductions are by spur gears.

(32). From these it is drawn off to railroad cars, the larger sizes going over the lip screens (36), (37), (38) and (39). Lip screenings are returned to the breaker for reparation by means of the conveyors (39a) and (34).

In all twenty-one Elmore jigs are installed in this breaker. These are driven by four 75-hp. motors through line shafts. These shafts are carried on pedestals from the floor, and one of them is mounted on roller bearings. This roller-bearing installation is in a degree experimental and the results obtained from it

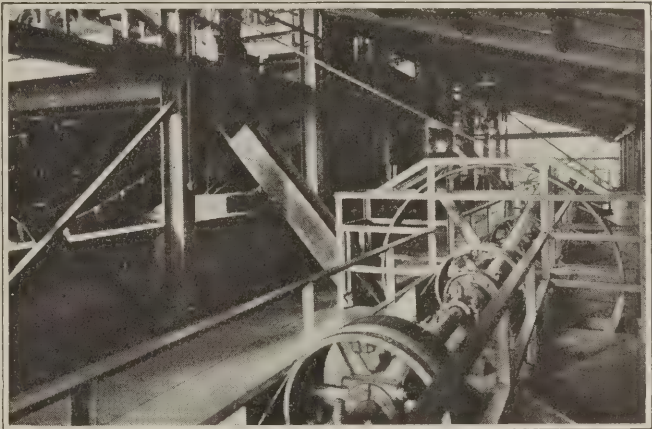


Fig. 7—Line Shaft Driving Jigs

Here again pulleys, couplings, belts and the like are carefully railed and boxed in to protect the workman. These protective devices are investments in safety that pay big dividends.

be flushed into the dip workings of the mine. A large area over old workings will thus be supported effectively.

The water used in the jigging and other preparation processes in this breaker is brought from the mine. After use it is sent to a settling tank of 500,000-gal. capacity located beside the breaker. The mine water

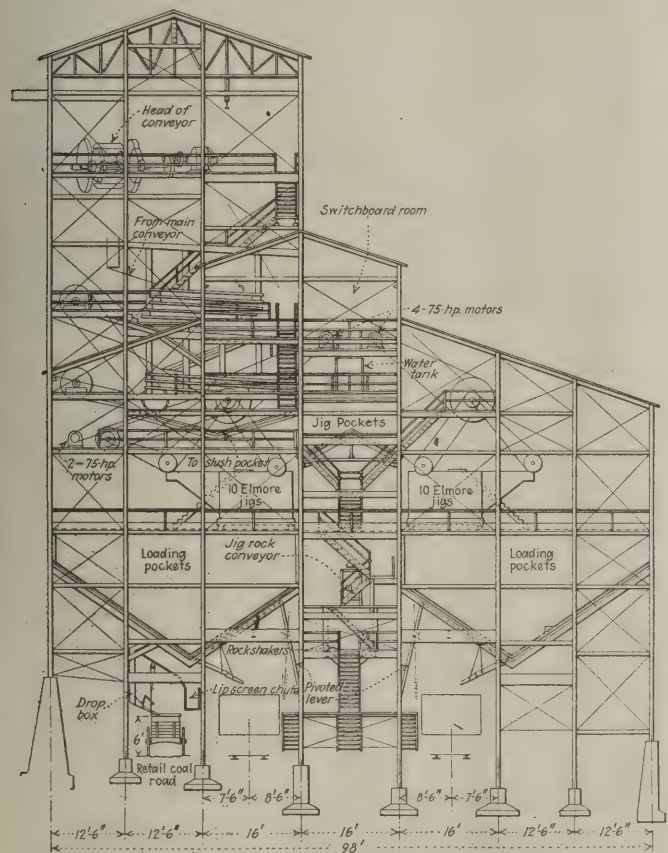


Fig. 6—Cross-Section Through the Breaker

This shows the relative positions of some of the machinery. Jigs are arranged on two sides of the building and driven in groups from line shafts. This affords a symmetrical arrangement of this machinery.

will doubtless determine the company's policy regarding similar installations in the future.

Plans have been completed for the installation of a rock crusher to which all rock separated from the coal during preparation will be delivered. This will be crushed to suitable size and transported to a borehole near the man-and-material shaft, down which it will

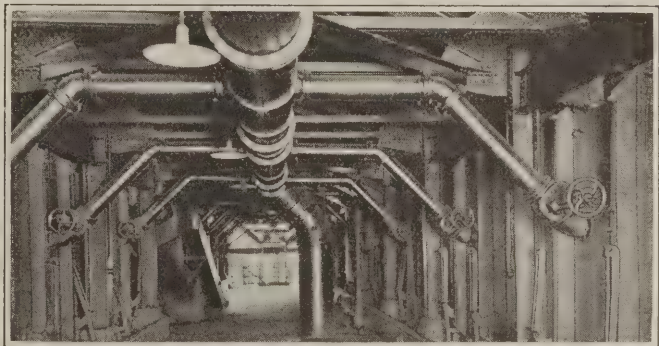


Fig. 8—Piping System Supplying the Jigs

Inasmuch as the water is used over and over again it becomes highly acidulous. Accordingly cast-iron pipe is used, and the valves are of acid-resisting type.

thus forms what is really the make-up of the preparation system. Settlings or sludge from this tank are cleaned out once a week.

The main supply pumps are two duplex units installed in the pump house, which is a two-story structure adjoining the breaker. Each machine consists of two single-stage centrifugals driven by a 200-hp. induction motor. These machines are under a constant suction head from the settling tank and discharge to the top of the breaker. Either machine will supply all the





**Fig. 9—Loading a Car Under the Breaker**

It takes only a few minutes to fill a car as the capacity of each coal pocket above is greater than that of a railroad car. There are only two loading tracks under the breaker so that no appreciable delay in loading can occur or trouble would result. Because of the ample capacity of the pockets, however, no difficulty of this kind is experienced.

water required for sprays and the like, leaving the other pump as a spare.

On the floor above are installed two 14,000-gal. per minute centrifugal pumps supplying circulating water to the jigs. These are single-stage machines either of which is of ample capacity to supply all needs, so that the other may be held as a spare. Inasmuch as the water is used over and over again all these pumps, as well as all the water lines throughout the breaker are made of cast iron so as to resist the action of acid.

In the early portion of this article mention was made of the extreme neatness and cleanliness of this plant. Most people think of coal as being something that is

dirty, something that will contaminate, something that will smudge whatever it touches. Perhaps this belief is justified. If it be true, however, the Baker breaker is verily the "exception that proves the rule," for many a painstaking and scrupulous housewife keeps her beloved parlor in no more spick-and-span, apple-pie order than that in which this breaker is habitually kept. Concrete floors, as well as all machinery, window frames and the like are carefully painted, and an attendant—he could hardly be called a janitor—makes periodic rounds with a dust cloth and an O-Cedar mop.

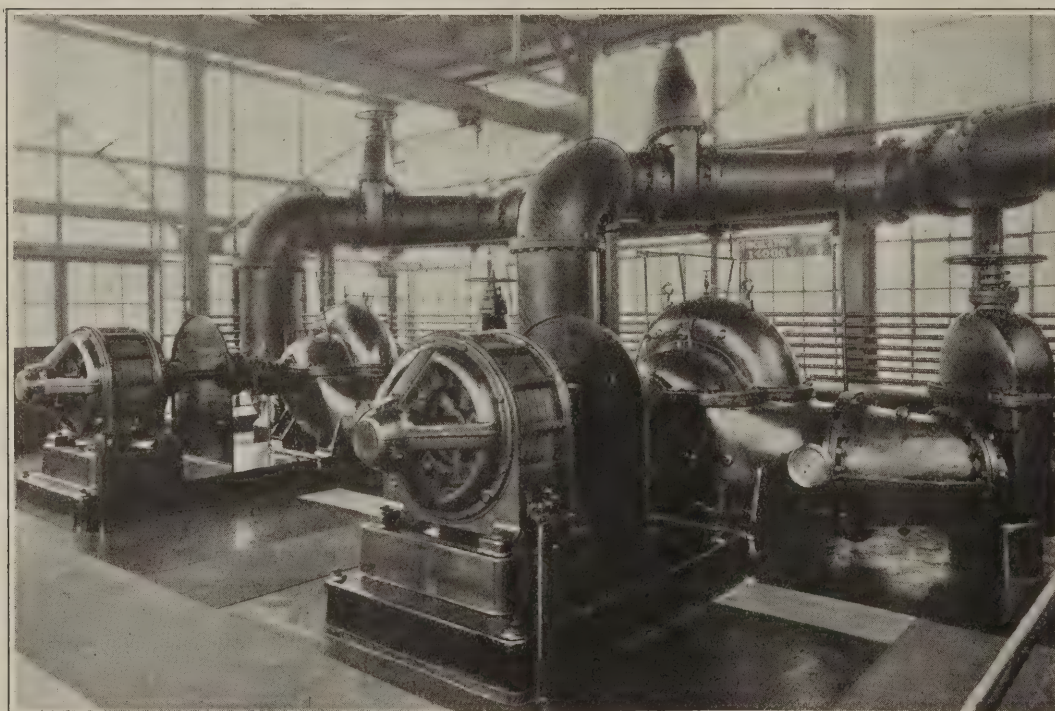
To one familiar with the breakers of former days, breakers, where, as Berton Braley put it,

"There is coal dust on the winders an'  
there's coal dust in the air,  
It's stickin' to the timbers an' it's  
settlin' everywhere,



**Fig. 10—Interior of Railway Scale House**

Railroad scales are installed both above and below the breaker. The "weighman"—who in this instance happens to be Miss Haggerty—is here shown recording the weight of a loaded car just before it is turned over to the railroad company for transportation to market.



**FIG. 11  
Circulating  
Pumps**

These machines are duplicates, either being capable of supplying the jigs with water. They are installed in the pump house which is separate from, yet attached to the breaker as a kind of a wing. Here, as in the breaker itself, note the extreme cleanliness—everything is neat, spick and span.



"It's clingin' to our eyelids an' our whiskers  
an' our hair

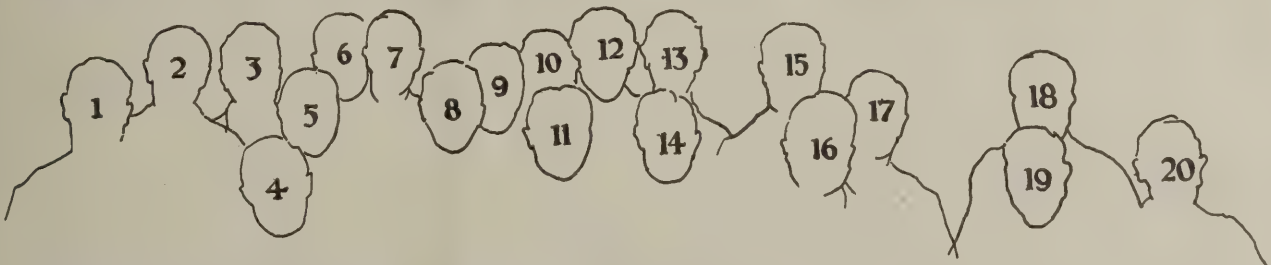
An' we eats it in the breaker by the pound!"  
this may appear like carrying neatness to an unnecessary extreme. This view, however, may be open to serious question.

#### THE UNCLEANLY BREAKER IS NOT PROFITABLE

As a matter of fact neither men nor machines can do their best when lungs are clogged with dust, bearings "stogged" with dirt and all movements are hampered and trammelled with this material. Certainly enough squalor and filth may be found in most mining communities to satisfy anyone who believes that dirt is the running mate, the unavoidable accompaniment of coal production.

On the other hand it is well-known that no single force available to the coal operator is more potent in its influence for good or evil, more conducive to success or failure as the case may be, than the morale of the personnel. Though it may be possible to foster and maintain a good morale in the organization under surroundings less æsthetic than those existing at Baker, the chances are strong that this desirable influence may be brought to its highest degree of perfection in surroundings of which a man well may be proud and for which he may acquire a real regard.

It is the exception rather than the rule that any human being can take genuine pride in, or exhibit a real affection for, anything or anybody that is unkempt. This is quite as true of localities, places and environments as it is of personalities.



Some of the Official Heads, Glen Alden Coal Co. Taken in Front of Main Office Building

- (1) S. J. King, turbine engineer; (2) William Taylor, payroll chief; (3) E. W. O'Malley, boiler inspector; (4) Thomas Bevan, store keeper; (5) H. M. Warren, consulting engineer; (6) W. F. Moxley, construction engineer; (7) M. J. Hoban, operator; (8) F. Hildebrand, auditor; (9) Dan F. O'Hara, steam-equipment engineer; (10) E. J. Falloon, hydraulic engineer; (11) S. D. Dimmick, vice-president and general manager; (12) C. R. Seem, electrical engineer; (13) C. E. St. John, mechanical engineer; (14) G. N. England, secretary and treasurer; (15) N. N. Nichols, chief mining engineer; (16) J. N. Shaw, purchasing agent; (17) Bradford Sampson, assistant to vice-president and general manager; (18) W. H. Williams, real estate agent; (19) M. L. Roper, general electrical foreman; (20) E. H. Adair, attorney.





*Hampton Power Plant and Distributing Towers*

## Glen Alden Generates and Distributes More Power Than Any Utility Firm in Hard-Coal Region

With Five Hundred Miles of Electrified Track, Many Breakers and Several Times as Much Water as Coal to Lift the Glen Alden Has Line Pressures as High as 66,000 Volts

BY EDGAR J. GEALY

Electrical Editor, *Coal Age*, New York, N. Y.

**A**LTHOUGH not the first anthracite mining company to use an electric mine locomotive, hoist or pump, the Glen Alden Coal Co. has for many years done most of the pioneering work in adapting electrical equipment to mine service. Today the company is recognized as having the most highly modernized and electrified coal property in the anthracite region. Present-day mining methods and many future developments in the industry will depend largely upon the past and present experiences and practices of this company's engineers.

Growing from a business which originally consisted of the purchase of a few lamps, telephones and signals the electrical purchases in this region for mine equipment have increased to about \$12,000,000 annually, to say nothing of the enormous volume of electric power-driven apparatus which always goes hand-in-hand with such development.

Economy, reliability, and safety were the impelling forces which have promoted this progress. The conditions to be met were adverse to the usual type of electrical apparatus. The liability to dangers and delays caused by acid mine water, coal dust, shock and vibration, all had to be considered. Nevertheless, the progress was consistently steady.

### UTILITY PLANTS IN REGION MAKE LESS CURRENT

Today the Glen Alden Coal Co. generates, distributes and uses more electrical energy than any individual public-utility company serving the northeastern section of Pennsylvania. Its power transmission lines extend from one colliery to another over a territory 24 miles

long. Line pressures as high as 66,000 volts are used. In and around Scranton the 250-volt direct-current distributing system of eight or nine different collieries forms a superpower network supplied from many scattered power-converting substations located on the surface and inside the mines.

The electrified track mileage of the fourteen collieries operated by the company totals about 500 miles. Four hundred and seventy-one trolley and storage-battery locomotives gather and haul approximately 10,000,000 long tons of coal per year.

The hoisting problems are many and varied. Some of the main hoisting shafts operate from two to eight different levels varying in depth from 20 to 1,400 ft. Inside the mines many large hoists are used on steeply pitching grades where from one- to ten-car trips are handled at speeds often greater than 1,200 ft. per minute. Room and car-haul hoists supplied either from low-voltage alternating-current lines or from the trolley system are scattered throughout the mines.

Anthracite mining companies as a whole pump about eleven tons of water per ton of coal mined, and the properties of the Glen Alden Coal Co. are no exception to this average. Most of the mines are located under or near the Lackawanna or Susquehanna Rivers, and in many places the coal beds are close to the surface or actually outcrop. These conditions require large pumping capacity.

Fortunately due to the nature of the coal beds, in the Scranton district, and also due to clever engineering and mining all the water from five and most of the water from three of the mines in this region is collected in a common sump. In this basin the company has built the largest pumping station in the coal fields. Five 5,000-gal. per minute centrifugal pumps each driven by a 1,000-hp. alternating-current motor are

NOTE—For years the surplus energy from the generating plant shown in the headpiece has been fed into the lines of the coal power company during emergencies. Direct connections to the large pumping station located nearby makes it possible to use a large amount of the power at low line losses. All the collieries in the Scranton district of the company receive power from this plant.



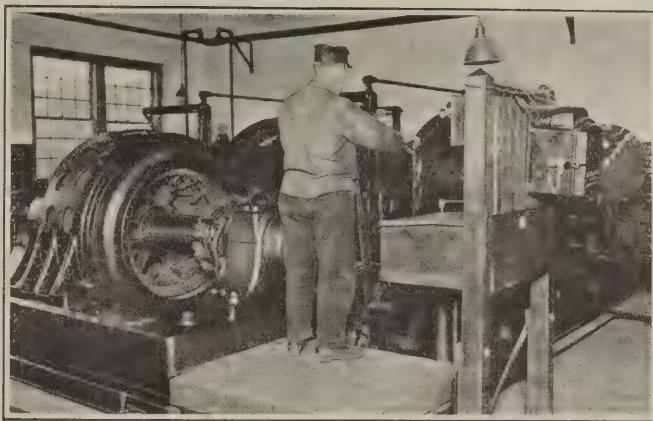
located in this pump room. On the surface nearby an 800-hp. automatically operated water hoist is held in reserve.

The ventilation problems are numerous and important, principally because of the many beds of coal mined from one shaft. The haulageways in some of the mines are long and irregular. Many of the roads and air-courses connect with adjacent mines and the properties of other companies. The mines near Nanticoke are some of the most gaseous in the world; consequently great care and consideration must be given to the ventilating system. At many of these mines auxiliary reserve fans are provided, some of which are operated by electric motors and some by steam.

#### MORE POWER USED ABOVE THAN BELOW GROUND

Modern coal preparation methods have necessitated many changes in the design of coal breakers and washeries. The use of large volumes of circulating water to prepare the coal has required numerous pumping units. Each process of breaking, screening, jigging, elevating and conveying the coal requires large amounts of power. Consequently, the power used to prepare the coal is often much greater than that to mine and transport it to the breaker.

In the Glen Alden breakers alternating-current inclosed-type motors generally are used. To provide positive safe operation and eliminate fire hazards motor-starting contactors and switching apparatus are located in separate control rooms near the breakers or in inclosed fireproof compartments built inside the breakers. Push buttons are located wherever it may be necessary to stop the motors in an emergency and all equipment may be started from points where the operator has full view of the apparatus being started. Usually the large induction-motor load of the breaker must be corrected for poor power factor and to accomplish this end synchronous motor-generator sets equipped with oversize motors wound for the same voltage as the



One of the Large Induction-Motor Hoists

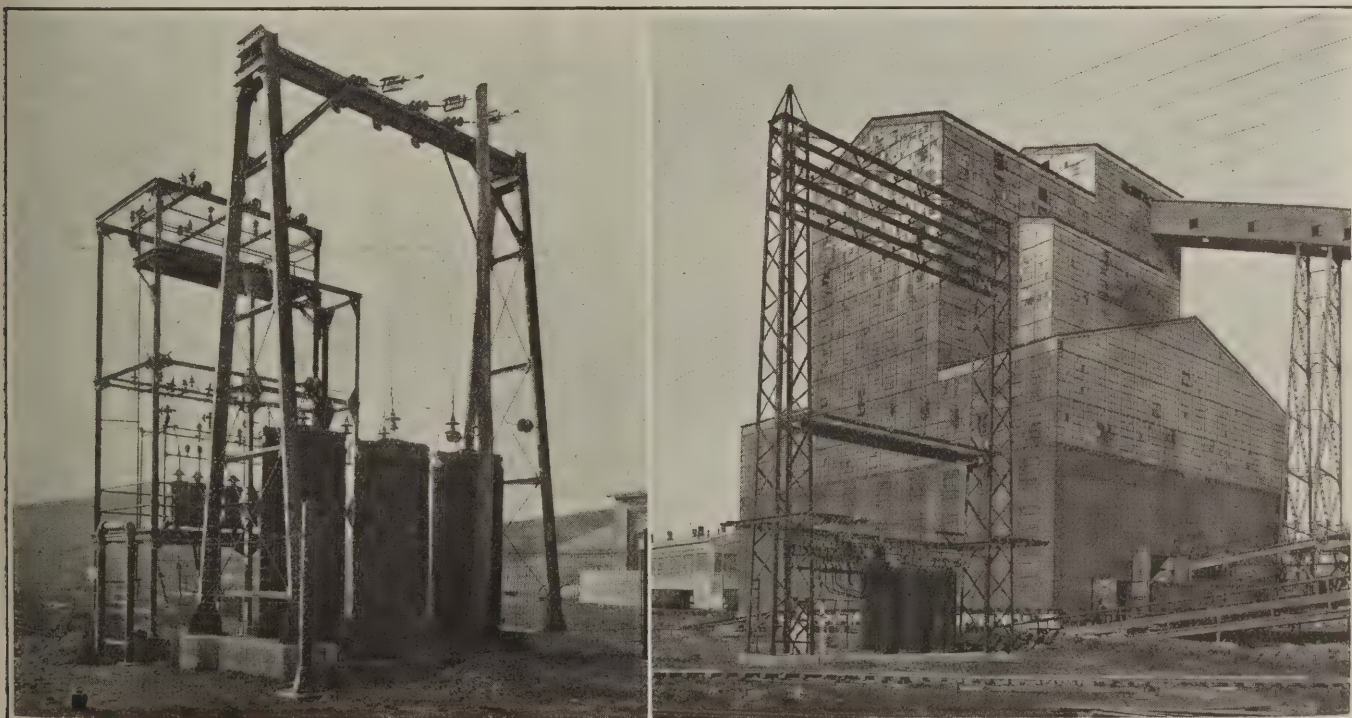
This hoist room like many others is modernly equipped with automatic safety devices. Overspeed and overhoist protective features make accidents unlikely. The lighting fixtures are arranged so as to prevent glare. Extensive changes are contemplated when the company will electrify many of the present steam-operated hoists.

breaker motors are often used and located near the main breaker transformers.

The 60-cycle, three-phase power-generating system of the company consists of four separate power plants having an aggregate capacity of 31,000 kva. These plants are advantageously located so as to be near centers of loads, utilize exhaust steam, provide economic transmission, proper line voltage and continuity of service. The largest of these plants is located near Nanticoke on the bank of the Susquehanna River.

The next largest plant is known as the Hampton power house. This plant is located near the load center of the Scranton district and also near the mammoth Hampton pumping station.

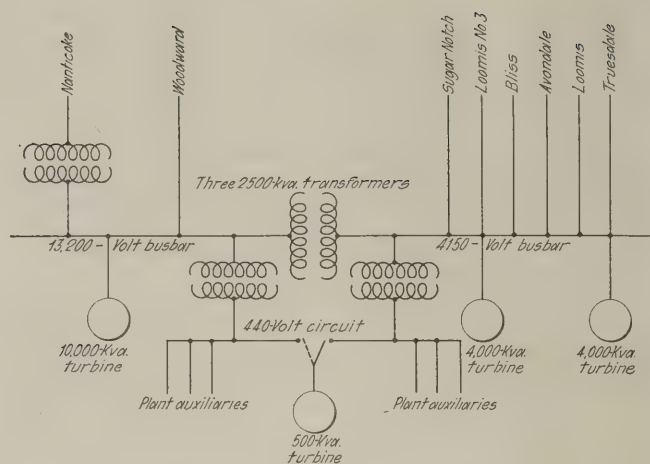
The third largest power plant is located at the extreme end of the properties. This plant, located at the Storrs colliery, furnishes power for the electrical equipment in its vicinity and thus obviates the neces-



Where High Voltages Are Reduced for Distribution to the Many Drives

These towers and transformer substations represent the latest practice of the company. They are built to stand as long as the breakers will operate. The supply lines to the newest breakers are all placed in underground conduits. All the other power lines are run on steel poles and towers around the outer limits of the colliery yard.





**Main Power Lines at Nanticoke Plant**

Separate lines direct from the power plant to the various collieries make it easy to sectionalize troubles. Interconnecting circuits between many of the mines provide means for balancing the distribution system.

sity for transmitting large quantities of power to this point from the Hampton power plant. The smallest power-generating station is at the Woodward colliery, near Kingston. This plant effects large savings by utilizing exhaust steam from the engine-driven shaft hoists and fans used at this colliery.

#### NANTICOKE PLANT USES RIVER FOR COOLING

The Nanticoke power plant was located near the Susquehanna River so as to obtain readily the necessary cooling water. This plant is one of the largest in the region and may be easily expanded to an almost unlimited generating capacity. At present the plant generates about 7,500,000 kw.-hr. per month. Additions which will cost over a million dollars are now being made and a 12,500-kva. turbo-generator will be installed.

The present equipment at this plant consists of one 10,000-kva., 13,200-volt turbo-generator, two 4,000-kva., 4,150-volt turbo-generators and one 500-kva., 440-volt turbo-generator.

All these machines are interconnected through transformers so that all of them are used to supply power to the transmission and distribution lines. Six oil switches control the same number of 4,150-volt distributing lines supplying the collieries in the immediate vicinity of the plant. Another oil switch controls a 13,200-volt line which ties the plant with the Woodward

power station. Still another oil switch controls the short 13,200-volt line leading to a bank of three 4,000-kva. water-cooled transformers which boost the pressure to 66,000 volts for the tie line to the Hampton power plant which is about 21 miles away.

Leaving the power house at Nanticoke this high-tension transmission line spans the Susquehanna River by means of steel towers. The line wires consist of No. 2 soft-drawn stranded copper conductors except at long spans, where 4-0 stranded copper conductors are used. Excepting at the long spans the line is on butt-treated wood poles. Between the Nanticoke and Hampton plants this line crosses the Susquehanna River at two places and for the greater part of the distance it runs near the top of the mountains on the west side of the valley. The insulators on this line have made a wonderful record. Ever since 1919 when the line was put in service there has been no shutdown due to an insulator failure.

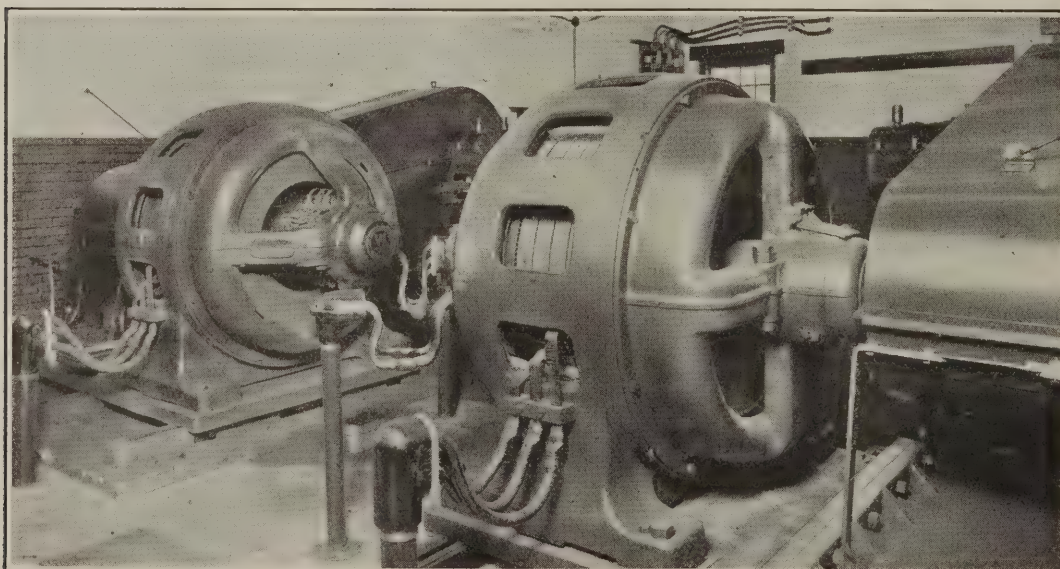
Near the Hallstead colliery at Duryea a tap is taken from the transmission line to supply equipment located at this operation. Here provision has been made should occasion arise, to open the line and furnish power to the Hallstead colliery from either the Hampton or Nanticoke plant.

The Hampton power house uses mine water for cooling purposes. The tie line with the Nanticoke plant is connected to three 4,000-kva. water-cooled transformers, duplicates of the step-up transformers at Nanticoke. However, at the Hampton plant the low-voltage windings of these transformers are connected for 4,150 volts. The present equipment in the Hampton plant consists of one 5,000-kva., 4,150-volt turbo-generator and two 2,000-kva., 4,150-volt turbo-generators.

#### EMERGENCY CONNECTION WITH POWER COMPANY

Many 4,150-volt distributing lines radiate from this power house. Two of these lines are directly connected with the Scranton Electric Co. and only used in case of emergency. The others run to the various collieries nearby. Two 16,000-volt lines also run out of this plant. One connects with the Storrs power house, and the other feeds a long line which supplies the Diamond colliery and ultimately connects with the Scranton Electric Co. and the Keyser Valley shops of the Lackawanna R.R.

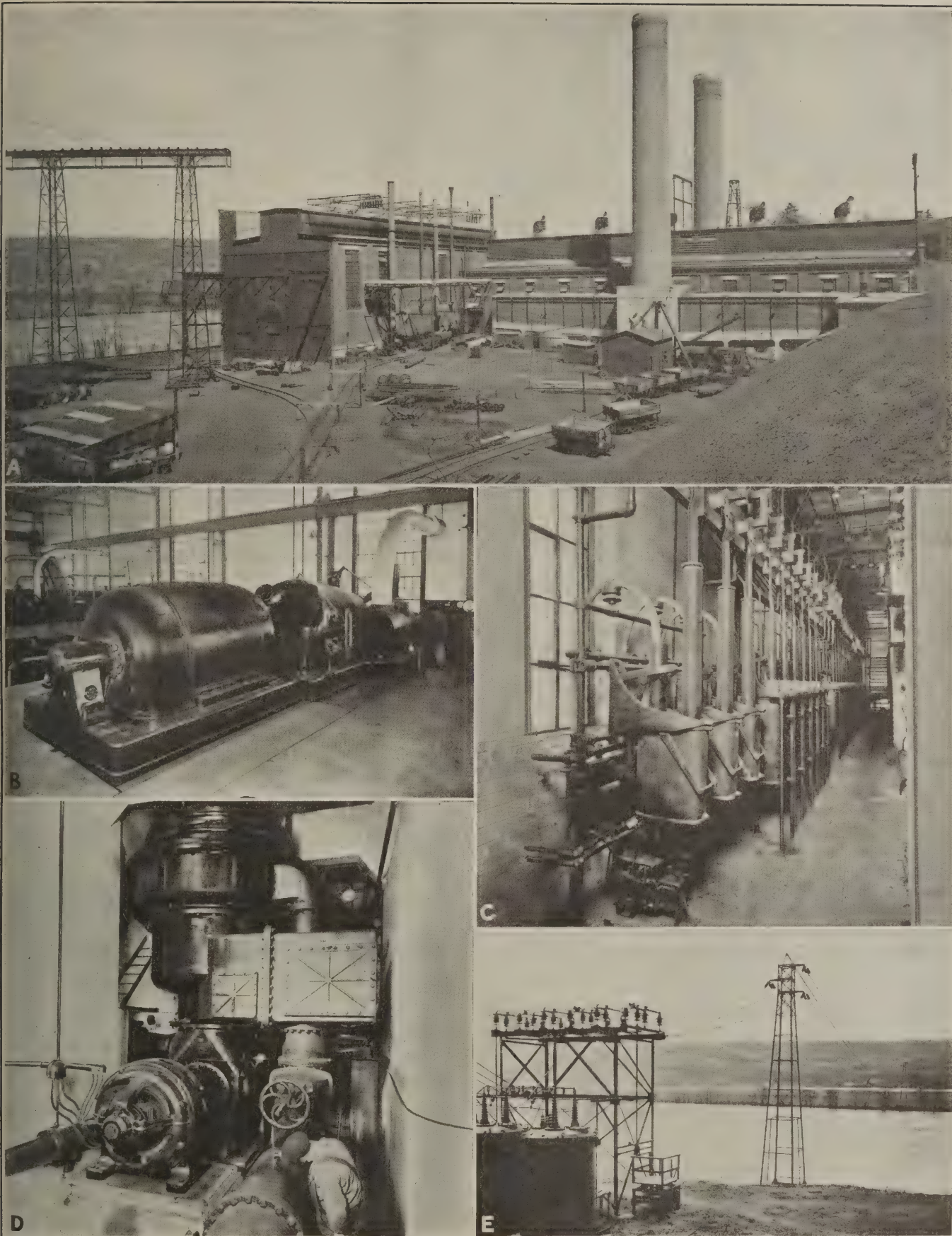
One 2,500-kva., 2,300-volt turbine at the Storrs colliery supplies part of the day load at this end of the



#### Typical Fan Drives

By installing duplicate fans like these the possibility of a shutdown at this mine is remote. Notice that the motors and drives are alike. This is another example of neat, permanent construction. The conduits and wiring fixtures are installed to last as long as any part of the machinery.

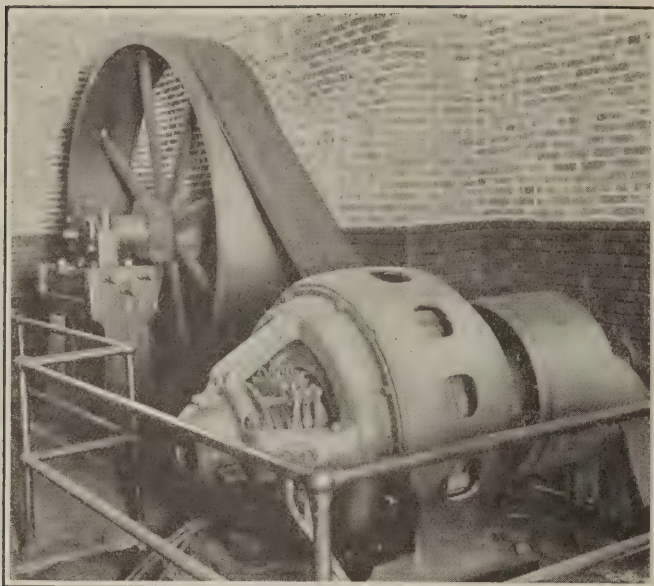




Interesting Views of the Nanticoke Power Plant

A—Outside view of boiler and generating plant. Here the small-size fuel is burned and the power transmitted over 24 miles. B—One of the large generating units. This machine has a full-load capacity of 10,000 kva. C—Where the power circuits are controlled. Continuity of service is of paramount importance; hence the rugged construction of these switches. D—Large turbine condenser and drive. The cooling water for this unit comes direct from the river where there is always an ample supply. E—How the plant is connected with other stations. The spans across the river are on steel poles. On the mountainside the line is run on butt-treated wood poles.





**Fan Drive with Anti-Friction Bearings**

When this installation was made, the workmen claimed that the large pulley was so well balanced and the frictional resistance was so low that a small nut placed on a spoke would cause the pulley to rotate. At the Loomis colliery near this installation mine gas accumulates rapidly. Consequently any savings in power in the fan drives are of great importance, for the fans must be run continuously at full speed.

line. The water used at this plant is mainly purchased from the water company. In spite of this drawback the demand for a power plant at this place became imperative when the new breaker was electrified and it became necessary to handle at this colliery most of the mine water of adjacent mines.

The transmission and distributing lines at the Storrs colliery are nearly all underground. Wherever it was necessary to run overhead wires they were carried on steel poles along the outside edges of the colliery yard. The underground conductors consist of lead-covered cables run in fiber duct concreted in troughs.

The Woodward power plant, installed in 1912, is an unusual installation. It consists of one 1,000-kva. low-pressure turbine. It utilizes the exhaust steam from three large steam-operated hoisting engines, three fans and one air compressor. The condensing water is circulated through a cooling tower which is assisted by a large air-circulating fan. Almost every year since it was installed this turbine has generated 1,800,000 kw.-hr.

The breaker at this colliery is completely electrified and for several years held the world's output record for anthracite, preparing over a million tons per year. At present the electrically operated Truesdale breaker of the same company holds the record, shipping about a million and a quarter tons of anthracite per year.

The boiler fuel used at the various boiler plants supplying steam to the electric generating equipment is what is known as buckwheat No. 4 or barley No. 2. This is a very fine grade of fuel which is unsalable on the market. Most of it comes from the fines on the ends of the various screens used in the breakers. Each boiler plant depends upon the collieries in its immediate vicinity for its supply of this fuel.

The present boiler equipment at the Nanticoke plant consists of twenty standard two-drum, 303-hp. boilers each equipped with a traveling chain-grate stoker. About 14,200 long tons of fuel are burned per month and 146,000,000 lb. of water evaporated in the same period. A large part of this steam is used to generate

electric power used for pumping purposes. Large pumps at the plant supply water to several of the collieries located within a radius of 3 miles from the plant.

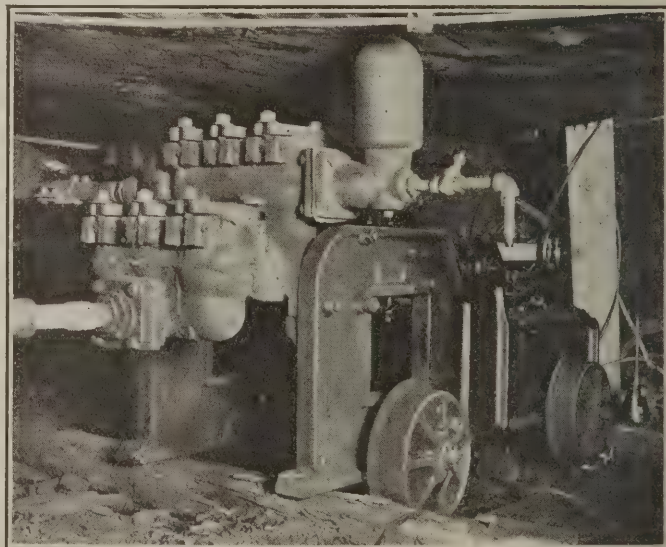
Ordinarily the boiler-feed water is raised to a temperature of from 200 to 208 deg. The volume of cooling water depending on the load carried by the plant, the vacuum maintained, and the temperature of the water as it comes from the river. The steam pressure supplied by the boilers is about 160 lb., and the vacuum at the turbines varies between 28 and 29 in.

#### LARGE PUMPING UNITS GIVE GOOD LOAD FACTOR

The peak load comes on the plant soon after eight o'clock in the morning. However the day load from 7 a.m. to 3 p.m. is quite steady. Because of the demand made by the big pumps provided where large quantities of water must be raised to the surface much of the pumping is done at night. This makes it possible to operate the generating plants at good load factors.

About a year and a half ago a large dam across the river below the Nanticoke power plant broke. Since that time the elevation of the water at the penstock is much lower and during the dry seasons, although there is ample water in the river, it is necessary to locate a pump on the bank of the stream close to the water. This pump is mounted on a truck and lowered down a plane. During normal operation 11,000 gal. per minute are required for the two surface condensers on the two 4,000-kva. turbines and a further 10,000 gal. per minute for a jet condenser on the 10,000-kva. turbine.

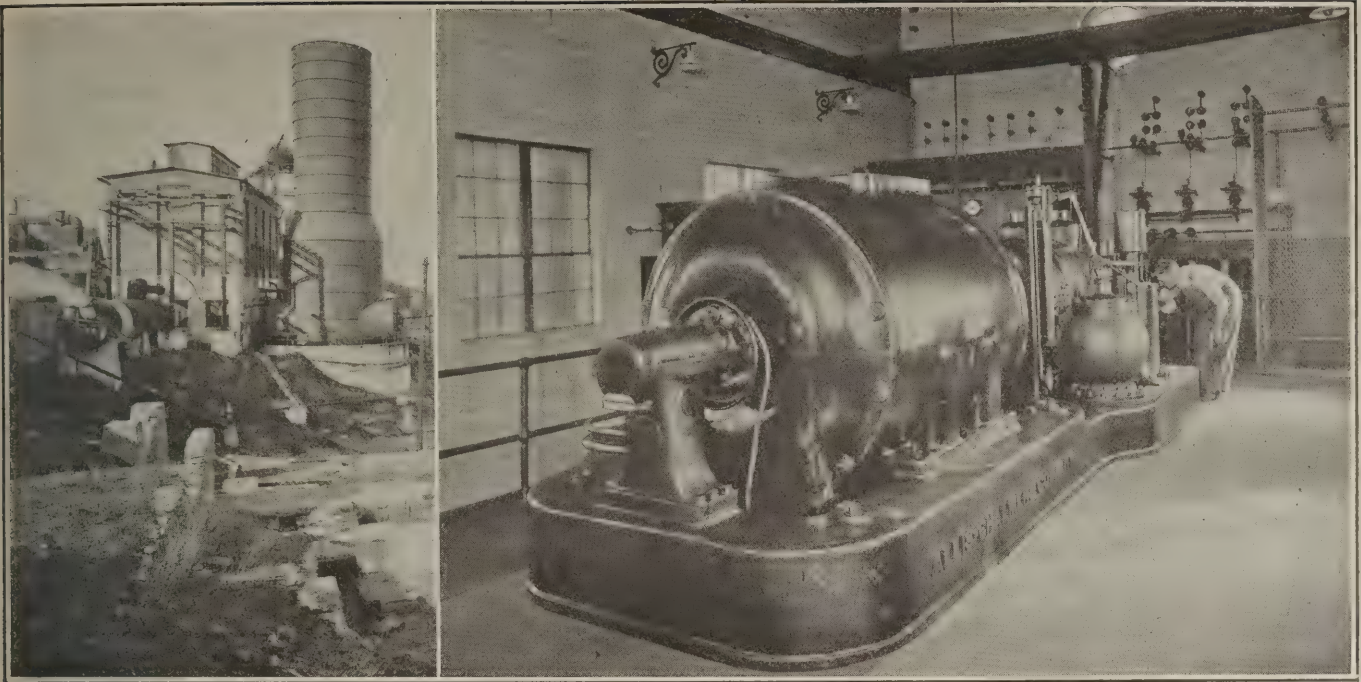
The Hampton boiler house furnishes large quantities of steam for use at the many collieries nearby, consequently the boiler capacity is much greater than that required to operate the turbines in the power house. In the boiler house there are fifteen 313-hp. boilers, five 613-hp. two-drum hand-fired boilers and three 613-hp. double-drum boilers fired by three double-compartment stokers. These boilers operate at about 148-lb. steam pressure, use 14,500 long tons of fuel per month and evaporate 151,022,000 lb. of water in the same period. The average monthly power output of the generators is about 3,420,000 kw.-hr. Because it



**Portable Gathering Mine Pump**

Units like this concentrate the water into large sumps where it is handled by centrifugal pumps. As the mining progresses these pumps are moved to new areas. Frequently they receive power from the trolley system. In the old workings where mining is scattered over large areas, many of these pumps are required to keep the rooms from filling up with water.





#### An Unusual Power-Generating Station at the Mines

Located where it can use what was formerly waste steam this plant has for many years supplied 1,000 kva. into the company's power system. This station utilizes low-pressure exhaust steam from the hoisting engines and fans at the Woodward colliery. This colliery is one of the largest producers in the anthracite field, and it is therefore important that ample power be available at all times.

is necessary to use mine water for cooling purposes all the condensers, spray plates, cones and pipes are heavily wood-lined.

Ten 300-hp. hand-fired boilers supply the steam requirements at the Storrs boiler plant. These boilers supply 140-lb. steam pressure for the turbine, fans and hoisting operations. The cooling water is circulated from the condensers to a large spray pond adjacent to the power house.

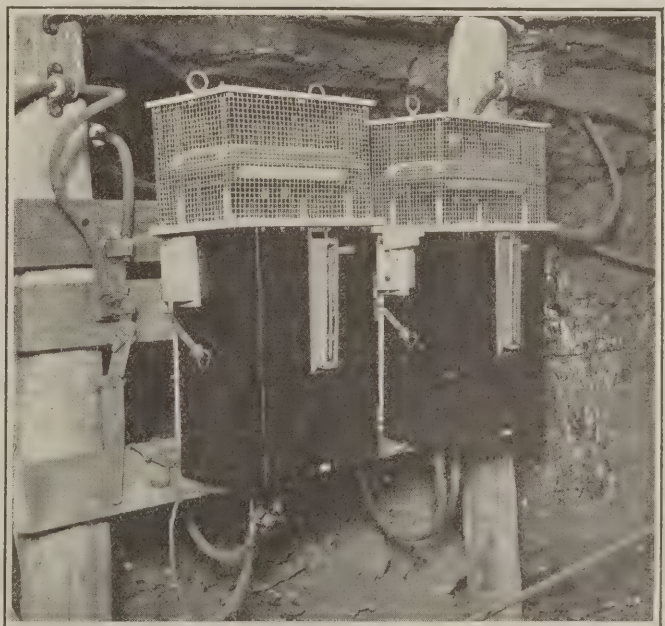
The steam used at the Woodward power house was formerly wasted. This plant uses exhaust steam at 3-lb. pressure from the colliery steam engines. The condensing water is pumped into a cooling tower and circulated back to the condenser. This method of cooling is very successful at this plant because of its relatively small capacity and low steam pressure.

#### MOTOR-GENERATORS REPLACE ROTARY CONVERTERS

Years ago when the only electric power load at the mines consisted of locomotives and a few direct-current pumps and hoists, most of the power-converting units were rotary converters. Now when many of the old breakers have been abandoned and new ones electrically equipped with induction motors have taken their places, there is a greater need for power-factor corrective equipment. Large pump and hoist motors have increased this need, consequently, many of the later power-converting units are motor-generator sets. Some of the motors on these units have been purposely made larger than ordinarily required so as to be able to correct the lagging power factor of the large induction-motor loads in the breakers and washeries.

In some places the converting substation is located outside the mines near the breaker, and the synchronous motor on the motor-generator set is wound for the same voltage as the breaker motors. This permits power-factor correction on the load side of the transformers thus effecting power savings and eliminating the necessity for over-sized transformers.

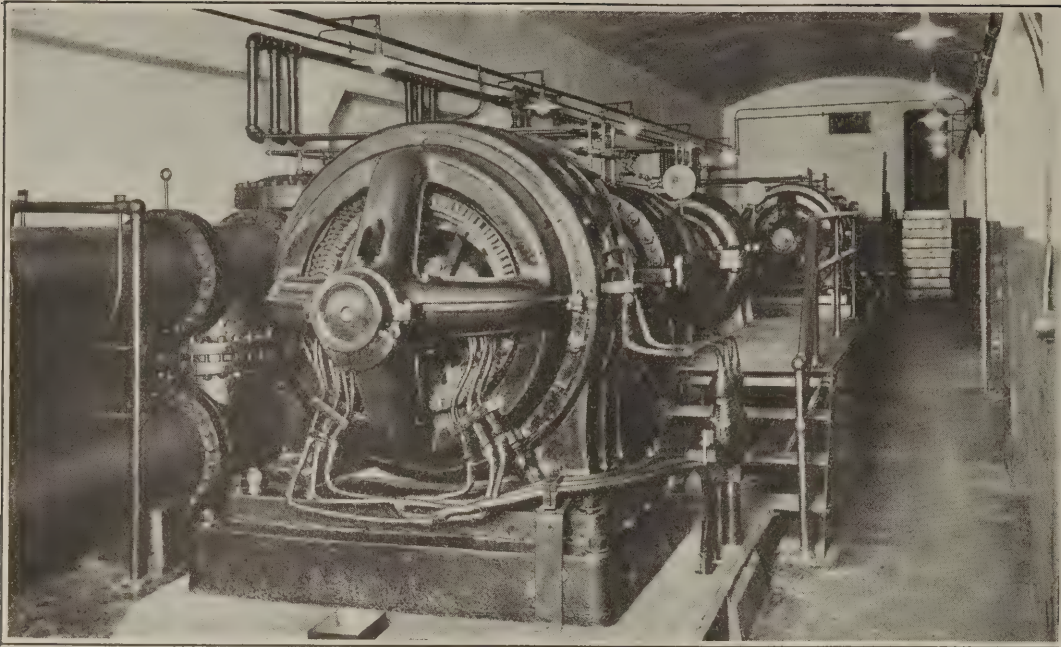
Nearly all of the power converting substations are located adjacent to or near a hoist, pump or fanhouse, therefore, the company has not considered it particularly necessary as yet to provide complete automatic operation. The direct-current system of most mines is protected by means of automatic circuit breakers which in some cases are provided with the self-reclosing feature. Where the machines operate in parallel with other units or are tied into a direct-current distributing system they are protected against reverse-current and overspeed.



#### How the Direct-Current Feeders Are Protected

These circuit breakers not only open under overload but sectionalize faulty equipment and grounded supply circuits. In the substations slightly different breakers make the direct-current distribution system function automatically. The attendant need only oil the generating equipment and see that the alternating-current apparatus functions properly.





### Storrs' Mine Pumps

The water at this colliery contains much acid, yet these pumps have given great satisfaction. Large 1,000-hp. motors, duplicates of those driving the Hampton pumps are supplied with energy direct from the local power plant. In emergencies and also at nights these pumps may also draw power over the tie line connecting the Storrs' power plant with the Hampton power house.

At most of the stations it is merely necessary for the operator to start and stop the machine and oil it occasionally, all other normal conditions are handled by the station protective equipment.

To the 471 trolley and battery locomotives now in service 26 new locomotives recently have been added. Those now in service consist of seventy-one 6½ ton, one hundred 7-ton, one hundred and ninety-three 8-ton, thirty-nine 10-ton, thirty-nine 13-ton, three 15-ton, one 20-ton, two 26-ton trolley types and twenty-three storage-battery locomotives. Seventy-two of these locomotives including the two 26-ton units are in service at the Truesdale colliery. As in the mines of many other anthracite companies the tracks in the Glen Alden mines are very irregular. Much of this is due to former methods of mining and to the large quantity of second mining being done. For these reasons the track-bonding, trolley and feeder systems in many sections of the mines are not very modern. However, main haulageways and main feeders are now being remodeled along more approved lines.

Most of the main shaft hoists are steam driven, although several large induction motor-driven hoists have

lately been installed. One of these new hoists at the Loomis colliery is driven by a 600-hp. motor and controlled by a liquid rheostat, another at the No. 3 Shaft of the same colliery is driven by a 350-hp. induction motor. Both of these hoists and several others are fully equipped with automatic safety devices including, overspeed, overwind and overload protective features.

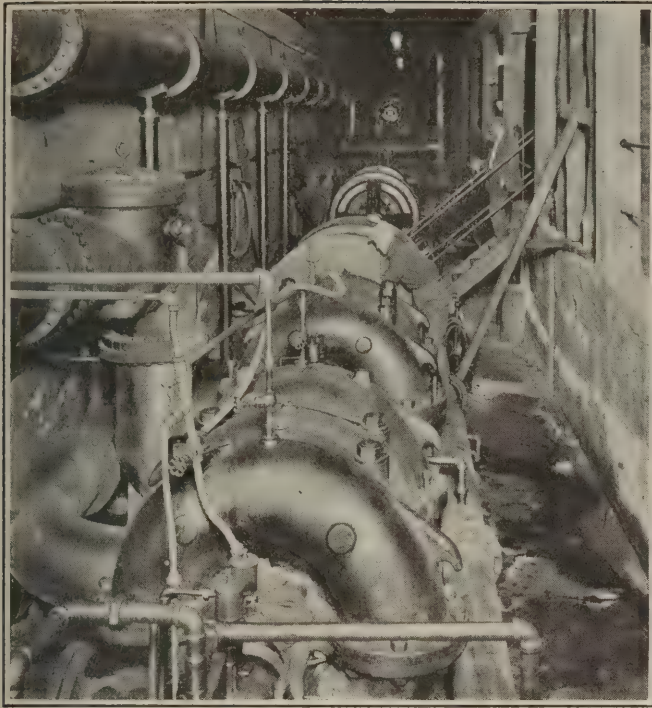
Some of the pump installations of the company are the largest and most up-to-date in the region. By the autumn of this year none of the pumps in the mines will be operated by steam or air. At present 301 centrifugal pumps are in operation to which are connected 39,000 motor horsepower and over 2,000 steam-engine horsepower. The aggregate capacity of these pumps is approximately 500,000 gal. per minute. There are also 239 motor-driven plunger pumps driven by about 3,500 motor horsepower. These pumps have a capacity of 28,000 gal. per minute. The combined motor horsepower of these two classes of pumps is about 42,500 and the combined pumping capacity approximately 528,000 gal. per minute. The total number of pumps including hand-operated and jig pumps is approximately 998.

### Tandem Unit

It seems quite natural that large tandem locomotives should be found at the Truesdale Colliery, the giant operation of the anthracite region. One of these double units hauls coal over the surface from the Sugar Notch opening to the breaker. Nearly all the trolley locomotives of this company operate from 275-volt circuits.







**Hampton Pumping Station, Largest in Region**

One of five 5,000-gal. per minute centrifugal pumps which raise the water 599 ft. to the surface. At this pumping plant all the water of five mines and most from three mines is gathered and pumped to a large reservoir. Each of these pumps is operated by a 1,000-hp., 2,200-volt, wound-rotor type induction motor.

Each of the five 5,000 gal. per minute pumps located at the Hampton pumping station, previously mentioned, pump against a 500-ft. head. During dry seasons 8,000,000 gal. of water are pumped in 24 hours and in the wet season 20,000,000 gal. are raised to the surface in the same length of time. The weight of bronze alone in each of these pumps is approximately 17,000 lb. The pumps are primed by air ejectors or vacuum pumps. Five 300,000-cm. three-conductor, varnished-cambric, lead-covered, armored cables, suspended in two lined boreholes, deliver 2,300-volt energy to the 1,000-hp. motors connected to each pump. Two of the pumps are controlled by automatic starters and three by non-automatic control panels.

At the Cayuga mines is an automatic pumping station. Originally a manually operated 1,500-gal. 630-ft.

head centrifugal pump replaced a large steam-driven reciprocating unit. In September, 1923, additional control equipment was added to the new centrifugal pump, so that now it is automatically primed, started, stopped, controlled and protected. When the water in the sump rises to a predetermined level the pump is automatically primed and started. While in operation it is protected against overload, loss of water, air leaks and column-line breaks. When the sump has been emptied to a predetermined level a float operates the control devices and automatically stops the pump and everything is made ready for a complete restart whenever the water again rises to the starting level. This pump is driven by a 400-hp. 440-volt induction motor.

#### ONLY A FEW SIZES OF CENTRIFUGAL PUMPS USED

By standardizing upon a few different sizes of centrifugal pumps many of the ordinary pumping problems have been obviated. This makes it relatively simple and inexpensive to carry in stock repair parts for nearly all the important pumps. Whenever an unusual accident occurs it is a simple matter to take an impeller, bearing or casing from one mine to another to make a hasty repair.

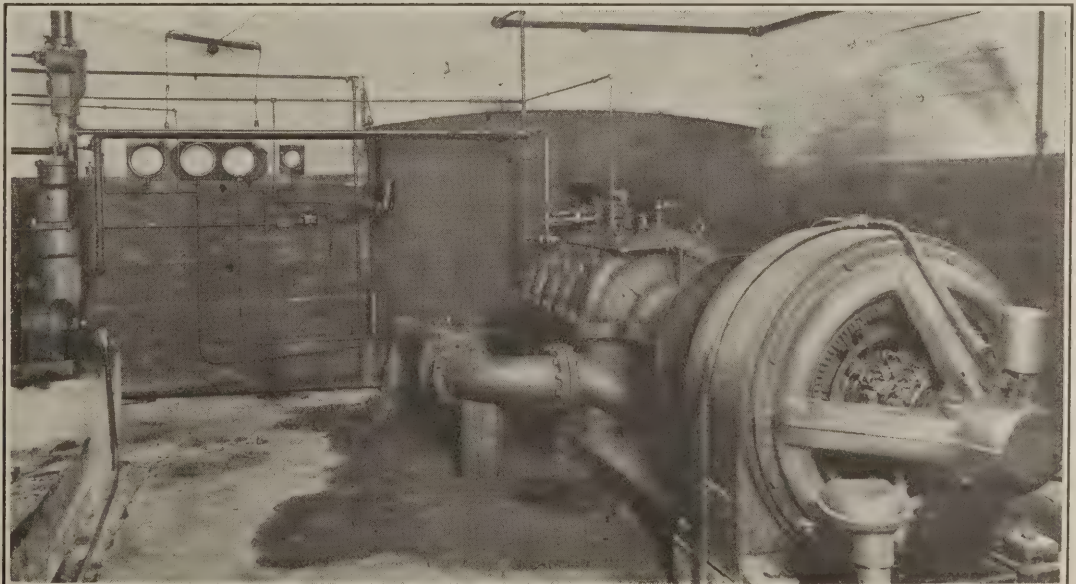
The large centrifugal pumps are standardized into three units. The first is a 12-in. three-stage unit having a nominal rating of 4,500 gal. per minute against a 300-ft. head. This pump is used between limits of 5,000 gal. per minute at 250-ft. head and 4,000 gal. per minute at 350-ft. head. The second unit is an 8-in. two-stage volute pump having a nominal rating of 2,000 gal. per minute against a 200-ft. head. This unit is used between limits of 1,400 gal. per minute at 230-ft. head and 2,400 gal. per minute against a 150-ft. head. The other large unit is a double suction single-stage volute pump nominally rated 3,500 gal. per minute against a 100-ft. head and is used between limits of 2,800 gal. per minute at 140-ft. head and 4,000 gal. per minute at 70-ft. head.

#### TEN-STAGE CENTRIFUGAL LIFTS WATER 920 FT.

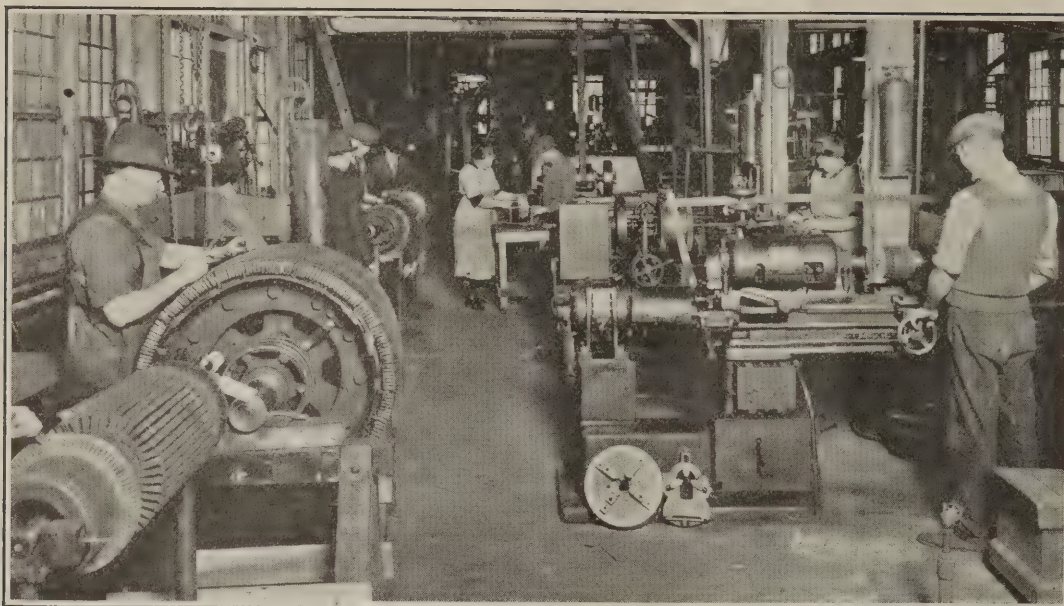
The largest capacity pumps at the Glen Alden's mines are two located in the Baker breaker for circulating water to the jigs and screens. Each of these pumps has a capacity of 14,000 gal. per minute. The highest lift of any of the centrifugal pumps on the Glen Alden property is on a 6-in. ten-stage, 800 gal. per minute

#### Pumproom Interior

Automatic pumping station at Cayuga. This centrifugal pump replaced a steam-driven unit. Centrifugal pumps save much pump-room space aside from their many other advantages. At this station the pump starts and stops when the water in the sump rises or is lowered to predetermined levels. At the extreme left of the picture is a part of the old pump foundation and the new vacuum pump which primes the centrifugal unit. Note the bearing thermostat on the motor.







### Repair Shop

Large and small motors and other electric equipment can be repaired in this shop. Standard and special coils are made on modern coil-winding machines. Each motor armature is wound, baked and machined before being placed in service. Spare coils and commutators are always kept on hand. Even large converter rotors are quickly repaired and returned to the mines by the auto trucks of the electric department.

unit at the Truesdale mines. This unit pumps against a 920 ft. head.

All the bronze centrifugal pumps purchased by the company are bought upon standardized specifications. The important specifications for a typical two-stage pump are in general as follows: The pump is to operate at a full-load speed of 1,170 r.p.m.; it is to be of the balanced piston multi-stage centrifugal type, preferably without diffusers; consideration will be given to two-

stage back-to-back type pumps having volute casings; preference will be given to pumps which can be most readily opened for inspection or repairs; casings to be of acid-resisting bronze and sufficiently heavy to withstand a working pressure equal to twice the rated head; impellers to be of the inclosed type and to be of bronze; all parts of the pump coming in contact with water to be of bronze consisting of 75 per cent copper, 10 per cent tin and 15 per cent lead.

## The Miner's Torch

### The Closed Door

**O**CCASIONALLY we find men who are rated as conspicuous successes in their line of endeavor who are willing to talk about the things to which they give credit for their success. Whether such talks have any real value to the fellows who are trying to climb higher on the ladder of success is a fit subject for debate, but when we consider that two American monthly magazines are filled almost entirely with literature of that kind, and considering further that one of these magazines has almost the largest circulation of any monthly in America we must admit that such literature undoubtedly has wide appeal.

Recently I was thrown with one of the most successful designing engineers of America (a man who has clients in a number of states and who has accumulated a no inconsiderable fortune from his professional activities) and in the course of our conversation he grew reminiscent and told me some things about himself and his methods that were not only interesting but suggestive as well. Had a professional interviewer been present my friend would have had a difficult time keeping his picture out of the magazines. This man attributes most of his success as an engineer to assistance received from sales engineers.

Here is the way he expressed it, as near as I can repeat it: "The best posted men in America today are the sales engineers who are in the employ of the large

manufacturing companies. They not only know all about all of the things which their employers manufacture but they are just as well posted about the things manufactured and sold by their competitors. Furthermore, they are widely traveled as a rule and have seen their equipment in operation in all parts of the country under widely varying conditions and for every conceivable purpose. A machine or method may succeed in one part of the country and fail in another; if there is a reason they can tell you why. If there is no reason they can put you to thinking. And generally they are about as honest as the average humans.

"Numbers of times I have had my mind made up and was ready to recommend equipment for special jobs only to have my reputation saved at the last moment by a word of advice from a sales engineer who easily convinced me that my judgment was poor.

"And here is the strange part of the whole thing to me; the very fellows who are most in need of the kind of advice that sales engineers can give, absolutely refuse to give them an audience, even going so far as to insult them if they cannot get rid of them in any other way. Why there are some engineers who feel so strongly on the subject that they go all to pieces at the very mention of the title "Sales Engineer." If a man unfortunate enough to possess a card bearing that title following his name should use his card for purposes of introduction with engineers of that type he should count himself lucky if he escaped from the office without being offered personal violence."

**HYDROGEN HAS BEEN SOLIDIFIED** by Dr. C. W. Kanolt. The gas was subjected to a pressure of 3,000 lb. per square inch, cooled artificially to -425 deg. Fahr. and further cooled 14 deg. Fahr. by evaporation.





## News Of the Industry



### Coal Operators Rejoice at Nomination of John W. Davis for President

Industry Feels Assured Against Advocacy of Regulation—Mining Unlikely to Be Prominent in Campaign—Charge of Wall Street Domination Disproved by Defense of Glass Blowers' Union

BY PAUL WOOTON  
Washington Correspondent of *Coal Age*

Regardless of party affiliation, the coal operators are rejoicing in the selection of John W. Davis as the presidential nominee of the Democratic Party. With the party's leadership in his hands the industry feels assured that no unsound foray into the regulation of the coal industry will be advocated during the campaign by the Democrats or put forward by the party if it be vested with the administration of the government.

Had one of demagogic tendencies been selected as the Democratic standard bearer the regulation of the coal industry easily could have been made one of the major talking points. There would have been the further temptation to do it because it is known that Senator La Follette will make it one of his principal issues. While the Democratic platform mentions by name only the anthracite industry, it is a fact that the original draft of the plank applied to the entire coal industry. The point was raised in the resolutions committee that there is nothing in the bituminous-coal industry which possesses a semblance of monopoly.

#### New England Hits at Anthracite

Since it was really anthracite at which the New England members of the committee were striking, there was no objection to confining the specific mention to that type of coal.

With Mr. Davis as the Democratic candidate, the probabilities are that little will be heard of the anthracite regulation plank. To start with, Mr. Davis comes from a coal-producing state. He is particularly familiar with the bituminous-coal industry and understands the situation in the anthracite region. He knows that it is going to take more than coal to cause the strongly Republican states of New England to abandon their favorite son. The probabilities are that under Mr. Davis' leadership no particular bid is going to be made for the New England vote. He knows that energy can be expended in other states where the prospect of carrying them is better. Moreover, Mr. Davis knows that any proposal to regulate the anthracite industry will be regarded by the bitu-

minous-coal industry as the first step toward the regulation of the latter.

Mr. Davis also knows that it is impossible to regulate profits without regulating prices, and that you cannot regulate prices without eventually regulating wages. He knows just how



©Harris & Ewing

John W. Davis

Nominated for President at the Democratic convention in New York City, July 10, on the 103d ballot.

unpopular any such program would be with capital and with labor. Labor might go along on a proposal to nationalize coal mining—although it is divided on that—but it never would seriously recommend that the government undertake the regulation of this speculative and highly complicated industry.

From the standpoint of practical politics it seems improbable that a leader of Mr. Davis' understanding would give emphasis in the campaign to a recommendation which would be overwhelmingly unpopular in the coal-producing states, several of which are of doubtful political complexion. Any proposal to regulate the coal industry from a federal bureau in Washington would be overwhelmingly disapproved in such states as Illinois, Indiana, Kentucky and West Virginia.

The main weakness of Mr. Davis as a candidate, it is asserted, is that he appeals strongly to Republicans but will not get their votes. William Jennings Bryan had much to say at the New York convention about the impossibility of Mr. Davis freeing himself from his allegiance to Wall Street. Big interests have contributed so much to his income that Mr. Bryan, prior to the nomination of his brother as Mr. Davis' running mate, was certain that they would continue to be his master. In that connection, however, it is pointed out that there will be difficulty in convincing the country that Mr. Davis is a creature of Wall Street, since it was he who drafted the Clayton Act, who has more than any other one man, some claim, to establishing the principle that labor is not a commodity and who has been retained by trade unions as frequently as he has been by big business.

The last case he won before the Supreme Court of the United States was for the glass blowers' union, a case involving alleged violations of the anti-trust statutes by the union.

#### Mine Workers Opposed Davis

At the convention the chief opposition to Mr. Davis' candidacy appeared to come from the United Mine Workers. The United Mine Workers' only argument against him, so far as it could be learned, consisted in the fact that he had represented the Bituminous Operators' Special Committee before the Harding Coal Commission. As in the case with Mr. Bryan, there was no charge that Mr. Davis had made any misrepresentations in his service for the coal operators. The opposition seemed to be based solely on the ground that he had committed the unpardonable crime of having accepted employment at their hands. While Mr. Davis did appear before the Coal Commission in behalf of the Bituminous Operators' Special Committee, his participation was limited to legal questions with which the United Mine Workers probably would take no issue.

#### Ford Leases Superior Dock

William S. Harmon and Frank L. Stein, receivers for the Maynard Coal Co., of Columbus, have closed a lease with the provision of purchase for the properties of the Superior Coal & Dock Co. at Superior, Minn., to the Ford Motor Co. The deal has been pending for some time and the approval of the court was given July 12. The lease carries with it the privilege of purchase within a year at the announced price of \$650,000 and accrued taxes of \$8,500. The Ford Motor Co. will take possession of the dock at once.



## No Early Change Likely in Rules for Mine Rating and Car Distribution

No changes in the rules governing the ratings of coal mines and the distribution of cars to these mines seems probable at this time. It is confidently predicted by those who oppose any change in the present rules that the Interstate Commerce Commission will give the existing rules a thorough trial before ordering any change. The questions asked by members of the commission indicate that there is little disposition to put into effect the recommendation in this regard of the Harding Coal Commission.

The National Coal Association in opposing any change, urging that present rules be continued until there has been experience with them under car shortage conditions. In fact the association took the ground that the commission does not have the authority to promulgate an order placing mines on a commercial basis until there is a finding that the present rules are in violation of the statute. The National Coal Association believes that the commercial basis would produce discrimination between seasonal and non-seasonal mines and between large and small operators, and would place in the hands of the carriers an implement which could be used most insidiously were they inclined to discriminate. Issue also is taken with the claim that the proposed rules would eliminate the economically unnecessary mine or that they would simplify railroad operations.

### Gutheim Presents Case

On behalf of the Pittsburgh Coal Producers' Association, August G. Gutheim contended before the commission that "the rating of bituminous-coal mines for car-distribution purposes, based wholly or in part upon the commercial ability of such mines to sell coal the year round, would be unjust, unreasonable and would discriminate unlawfully against coal operators and against the railroads."

Some of the contentions set forth by the Bethlehem Steel Corporation follow: "Bethlehem operates seven large steel plants with a coal requirement at full

operation of about 12,000,000 tons annually. It owns 31 coal mines, operating 25 tipples, with an annual capacity of about 10,000,000 tons. Practically speaking, Bethlehem is a self-contained industry as to its fuel supply.

"When Bethlehem's steel plants are running full, they take all the coal its mines can produce. The steel business is subject to sharp fluctuations. At the present time Bethlehem's plants are operating at 40 per cent of capacity. Under these conditions, which are recurring and not unique, Bethlehem's mines have a potential production of 6,000,000 tons which its plants do not need. It is Bethlehem's established policy not to mine and ship this coal but to confine the operation of its mines to the current needs of its steel plants. Operating its mines in this way, and using its 4,000 private cars to move its own coal, as needed, Bethlehem has obtained a satisfactory supply of the special fuel it needs, without becoming a disturbing factor in either the commercial coal market or the distribution of system cars. Its private cars have been sufficient to serve fully its mines and these mines have made no call on system cars in times of car shortage.

### Waste in Commercial Rating

"If Bethlehem were forced by the adoption of the proposed commercial rating rule to enter the commercial coal market with its 6,000,000 tons of unneeded production, the result would be waste and financial loss to Bethlehem and an aggravated depression to the commercial coal industry, already suffering from slack demand and overdevelopment.

"Bethlehem's study of the question of mine ratings in this proceeding has confirmed its earnest conviction that for the best interests of all concerned an industry owning its own coal mines and consuming their entire output should be permitted the use of private coal cars for that purpose. Thus and thus alone, can such in industry withdraw alike from the competition of the commercial coal market and the competition for system cars."

## Besson Must Pass Test, Court Decides

Leon Besson, Governor Davis' new head of the Kansas mine inspection department, succeeding James Sherwood, must pass that qualifying examination after all. The State Supreme Court has decided it. When he was appointed and the appointment was ratified by Governor Davis' two appointees on the Kansas Industrial Court, the third member, Presiding Judge John H. Crawford, protested that he was being railroaded into office and should be required to pass the examination for "deputy mine inspectors," a phrase used in the law covering the matter. Governor Davis and Besson contended that Besson was appointed as "state mine inspector" and therefore the law did not apply.

Two days following the ouster decision Presiding Judge Crawford announced that he and Judge Martin had appointed Ernest Shaw, chief deputy, to act as inspector. Besson continued at his office. He said he would do so until he received an official order from the Industrial Court to vacate it.

## K. U. Meguire to Open Big Strip Pit in West Kentucky

The Dawson Daylight Coal Co., in the Dawson Springs district of western Kentucky, which is controlled by K. U. Meguire and associates, of Louisville, is getting ready to launch what may be the largest coal stripping operation in the State of Kentucky. A branch line of the Illinois Central R.R. to this property was more than a year late in finally connecting it with the outside world, but the company, while handicapped in the matter of getting material and equipment to the property, has made headway and completed a tippie with a capacity of 5,000 tons of coal daily, or about 100 cars, before the railroad reached the property. At the present time the company is assembling a Bucyrus No. 320 revolving steam shovel with a 7-yd. bucket, which will be used for removing overburden.

This will represent the first invasion of the Meguire interests into the west Kentucky coal fields, the company having heretofore operated in eastern Kentucky exclusively, with some big plants in both the Harlan and Hazard fields.

## Bituminous Coal Loaded Into Vessels at Lake Erie Ports During Season to End of June

(In Net Tons)

Ports	Railroads	1924		1923		1922	
		Cargo	Fuel	Cargo	Fuel	Cargo	Fuel
Toledo.....	Hocking Valley.....	2,283,927	67,447	2,351,374	1,553,478	45,717	1,599,195
	N. Y. C.-Ohio Central Lines	4,505	227	4,732	642,792	19,653	662,445
	Baltimore & Ohio.....	468,692	14,834	483,526	723,174	21,577	744,751
Sandusky.....	Pennsylvania.....	637,844	19,219	657,063	835,312	24,321	859,633
Huron.....	Wheeling & Lake Erie.....	262,486	12,726	275,212	504,478	18,071	522,549
Lorain.....	Baltimore & Ohio.....	454,962	42,758	497,720	968,567	58,641	1,027,208
Cleveland.....	Pennsylvania.....	350,273	55,631	405,904	641,445	53,040	694,485
	Erie.....	113,021	3,631	116,652	358,487	15,176	373,663
Fairport.....	Baltimore & Ohio.....	151,589	33,491	185,080	224,947	20,860	245,807
Ashtabula.....	New York Central.....	326,648	38,807	365,455	1,372,834	79,608	1,452,442
	Pennsylvania.....	321,273	27,629	348,902	640,104	26,908	667,012
Conneaut.....	Bessemer & Lake Erie.....	557,685	81,051	638,736	958,390	58,164	1,016,554
Erie.....	Pennsylvania.....	137,330	24,161	161,491	207,098	26,551	233,649
Totals.....		6,070,235	421,612	6,491,847	9,631,106	468,287	10,099,393
*1923 Storage Loading.....		182,060	4,940	187,000			3,580,556
							131,266
							3,711,822

\* Coal loaded into vessels in December, 1923, after close of navigation and forwarded during 1924 season of navigation. Compiled by Ore & Coal Exchange, Cleveland, Ohio.



## Electric Lamps Now in Use In Oklahoma Mines

The chief mine inspector of Oklahoma is losing his fight against the use of electric cap lamps in the coal mines of that state. The District Court at Oklahoma City has restrained him from preventing the use of such lamps and about 900 men wearing them have gone back to work in the three mines of the Rock Island Coal Mining Co. at Hartshorn. Inspector Ed Boyle has appealed to the Supreme Court of the state, but the lamps are in use and the company is producing coal once more after a shutdown lasting more than six weeks, during which the whole region has been upset by the violence of the argument over lamps.

The controversy has been brewing for two years, or ever since the Rock Island company put electric cap lamps into its No. 12 mine. A year ago when a district inspector ordered them into the company's other two mines with the company's entire consent, the chief inspector objected strenuously.

After John L. Lewis, president of the United Mine Workers, had helped write an electric-lamp provision into the wage agreement for the Southwest district early in May and the Rock Island company bought lamps for its whole group of mines and started their use, Chief Inspector Boyle went on a rampage, ordering the use of nothing but carbide lamps in Oklahoma and posting notices at the Rock Island mines threatening arrest for anybody who wore them and court action against any company that tried to use them.

This produced a strike at the Rock Island mines, fostered by an Alexander Howat element which is in control of the district union. Many mass meetings and much uproar followed before the mines reopened early this month under court protection.

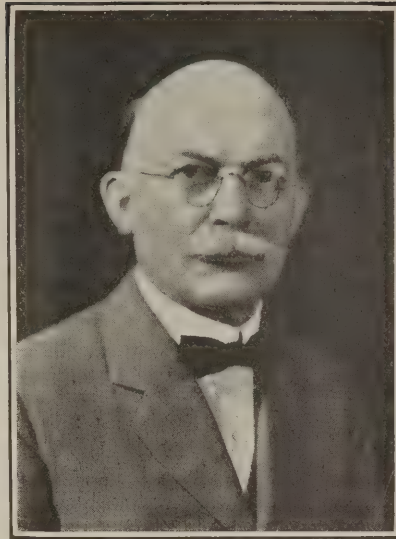
### Boyle "Knocks" Electric Lamps

In spite of the claim of the company and of Bureau of Mines engineers that electric cap lamps are safest in gas, Chief Inspector Boyle contends they are dangerous. In a public statement he set forth his case thus:

"With an open-flame lamp the miner can tell by the flame the condition of the atmosphere. When conditions are dangerous, the flame is straight and does not quiver. He knows there is danger.

"The closed lamp gives less than 1 candlepower; the open flame lamp gives 5 candlepower. If you were digging coal in the bowels of the earth, which would you prefer? The Rock Island Coal Co. has used open-flame lamps down there for twenty years with the best of results. Why quit? Oh, just to save a few dollars. The lives of the men are worth saving too. That is what this department is for.

"Ninety per cent of the accidents in mines in this state are caused by other than gas explosions. L. C. Ilsley, engineer of the Bureau of Mines, Washington, D. C., testifying before the congressional committee after the Virginia mine explosion said: "The explosion was caused by an unapproved



©Underwood & Underwood

C. W. Bryan

Governor Bryan established 158 coal stations in Nebraska and claims to have saved consumers \$10,000,000 in their coal bills.

electric coal drill; that in Pennsylvania by an unapproved electric coal cutting machine; that in Utah by an unapproved flame safety lamp."

"The idea is that the closed lamp without proper electric insulation throughout the mines is very dangerous because of fire flashes."

## Court of Appeals Affirms Decision Against Company In Coronado Coal Case

A decision of the Eighth Circuit Court of Appeals, filed at St. Louis, July 12, affirms the unanimous ruling against the Coronado Coal Co. made by the U. S. Supreme Court, June 5, 1922. The opinion was written by Judge William S. Kenyon and concurred in by Judges Walter H. H. Sanborn and Robert E. Lewis. This apparently brings to an end the ten years of litigation in which the Coronado company vainly sought to recover treble damages, amounting to \$600,000, from the United Mine Workers for destruction of property by striking miners at the Bache-Denman mines in Arkansas in 1914.

The case had been remanded by the Supreme Court in 1922 for a new trial after a lower court had given judgment to the Coronado company for \$200,000 damages, which would have been trebled under the Sherman anti-trust act.

On the ground that there was nothing in the evidence to show that the International union or International board of the United Mine Workers had authorized the strike or taken any part in preparation for it or in its maintenance or had ratified it by paying any of the expenses, the Supreme Court concluded that the International union and its officers should not have been held by the trial court as subject to joint liability with the district and local organizations and officers for participation in the conspiracy or for the destruction of property incident to the strike.

## C. W. Bryan, Nominee for Vice-President, Sold Coal To Consumers in Nebraska

On his arrival at Atlantic City, July 11, C. W. Bryan, Democratic nominee for Vice-President, said of his administration as Governor of Nebraska and his attitude on state ownership:

"We have reduced the price of coal of all kinds from \$3 to \$5 a ton. I furnished coal to municipalities and homes at wholesale. I have been selling it, personally, to 158 towns and cities in Nebraska, buying it in carload lots from the mines. This forced the coal combination to reduce its prices. The people saved \$10,000,000 last year by our coal stand. I am not in favor of federal, state or municipal ownership of anything except natural resources, such as water, but when business combinations, particularly utilities and those supplying vitally necessary products, defy all authority and endeavor to mulct the public, then I think that the government should sternly repress them, using whatever means may be efficient."

Mr. Bryan pursued the same tactics with regard to gasoline and claims that he reduced the price in the capital from 23c. to 17c. per gallon. He proposes to do the same in all sections of the state unless the price is reduced to 15c. He claims to have reduced the cost of road building 25 per cent and the cost of gravel 33 per cent.

## Mines Bureau Plans Further Co-operation with British

In addition to interchange of the results of previous research work on safety in mining by the United States and British governments a technical representative of the British government will be assigned to the Pittsburgh station of the Bureau of Mines, while a member of the bureau's technical staff will be accorded similar facilities to observe the progress of British work, said H. Foster Bain, Director of the U. S. Bureau of Mines, on his return from the Empire Mining and Metallurgical Congress in London. The bureau is to undertake tests of the British "permitted" explosives. The British have been less successful than has this country in producing explosives that will give satisfactory service in coal mines.

A. C. Fieldner, superintendent of the Pittsburgh experiment station, with a member of his technical staff, now is in England conferring with the Fuel Research Board of Great Britain relative to the processing and better use of coal. This is in anticipation of the time when it will be necessary to supplement petroleum supplies with benzol and other oils derived from the by-products of the distillation of coal. Every effort will be made to avoid duplication of effort in research work.

Mr. Bain spent much time with Mines Minister Shinwell, and it is entirely probable that co-operation between the two governments will be much broader than is outlined in the actual agreement, which is limited to matters pertaining to safety.



## MacDonald, Ousted by Union And Reds, Seeks a Job

Duncan MacDonald, who for a few days was Presidential nominee of the Communist-controlled convention of the Farmer-Labor party at St. Paul, is now seeking any kind of job he can find.

For years MacDonald has been in the limelight in labor affairs in Illinois. He was secretary of the state coal miners' union and president of the Illinois Federation of Labor. But today he is out in the cold.

MacDonald's first clash in organized labor was with Frank Farrington, president of the Illinois Coal Miners' Union. As secretary of that organization MacDonald launched an attack on a series of alleged irregularities in Farrington's office. In the bitter fight that followed, MacDonald was ousted, but he was elected head of the State Federation of Labor through the votes of the coal miners. He met defeat at the next election, however.

At the recent Peoria convention of the Illinois miners' union MacDonald was mentioned as Farrington's probable successor. The miners wanted him to make the race, but advised him to follow a cautious policy. But with apparent success in sight MacDonald joined William Z. Foster and his cohorts in forming a new third party in the state, believing it afforded him the necessary weapon to continue his fight against the Farrington machine.

At the St. Paul convention MacDonald was nominated for President, but last Thursday he was supplanted on the ticket by William Z. Foster. The Muscovite label attached to the St. Paul convention didn't appeal to either the farmers or industrial workers, however, and they indorsed La Follette.

## Machine Loader Scale Is Signed in Illinois; Men to Get \$10.07 a Day

*Special Dispatch to Coal Age*

Chicago, Ill., July 15—A scale for machine-loader operators has been signed in Illinois at last. The Chicago, Wilmington & Franklin Coal Co. has agreed to pay its loader men \$10.07 a day beginning July 16 and during the remaining life of the Jacksonville agreement, to which Illinois is committed.

This scale is not statewide because no other companies have loading machines, but now that a wage rate has finally been fixed, that rate naturally will be the one adopted by any other companies that go in for machine loading. In the agreement it is covenanted that the men are to work under the direct supervision of the company a full eight hours a day, and that in case of machine breakdown they are to perform any sort of labor that may be assigned them. It is "recommended" that they be given hand loading in such cases.

The union agreed to a day wage instead of a tonnage basis of pay because it is evident that the use of loading machines is still in an experimental stage. The scale is to apply to all loader operators, no matter what the developments of loading may be during the life of the agreement. The new scale was fixed at \$10.07 a day largely because that is the rate in Indiana, where a number of loaders are at work. Up to July 16 all the men operating the 14 Joys and the four Myers-Whaley loaders in the Orient No. 2 mine of the company were on development work and received \$8.54 a day and yardage. Under the agreement men on drilling and snubbing get \$8.04 a day. Cutting machine runners receive the union scale of 13c. a ton.

## Six Kanawha Companies Now Working Under New Scale

Of the twenty-six companies which joined in posting a new wage scale in the Kanawha region of West Virginia, marking a formal severance of relations with the United Mine Workers, six companies were able to resume operations July 7, under the new scale, according to reports made to the Kanawha Operators Association. The employees were glad to go to work again after an idleness lasting since April 1. The twenty-six companies referred to operate 45 mines in the Kanawha region and up until April 1 operated in agreement with the union.

A number of other companies in the Kanawha field have been operating on a non-union basis since the strike of 1922. The group of operators who have just announced their determination to operate on a non-union basis were unable to compete with the non-union mines when the union demanded that the Jacksonville agreement be subscribed to and hence shut down their mines until such a time as their employees would indicate that they were willing to accept a reduction in order that operations might be resumed. Action taken by the group of 26 operators means that the Kanawha field, formerly a union stronghold, is now almost exclusively non-union.

## Receiver Named for Egyptian And O. K. Companies

C. B. Thomas, referee in bankruptcy, East St. Louis, Ill., on July 11, was appointed by Federal Judge English as receiver for the Egyptian Coal & Mining Co. on the application of J. C. Hamilton & Co. of Marissa, Ill., and the Security National Bank of East St. Louis. The Marissa company holds the company's bonds while the bank is trustee under the bond issue.

The action was taken under a petition to foreclose the mortgage securing the bonds, which were issued in November, 1922, in the sum of \$250,000. The proceeds of the bond issue were used to improve the company's properties and to lease the O.K. Coal Co. property adjoining. J. A. Hamilton is president and W. E. Meek, vice-president of both companies.

Under the terms of the mortgage the trustee was entitled to foreclose if the mines were closed down and the bonds and interest not paid. Attorneys for the company admitted this condition and agreed to the appointment of Thomas as receiver. The company has assets estimated at \$450,000.

Last week stockholders of the O.K. company filed suit for a receivership, but this action was withdrawn preliminary to the Egyptian suit.

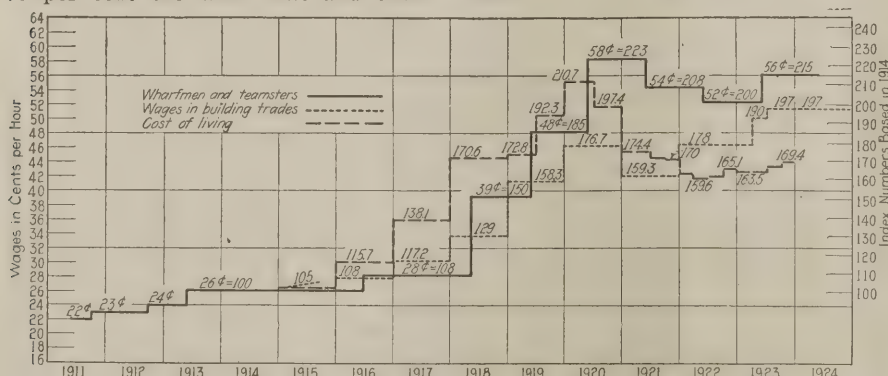
## "Soo" Shipments Gaining

Shipments of bituminous coal to the Northwest via the "Soo" Canals during June, according to the U. S. Engineers' office, totaled 1,493,759 net tons, compared with 1,138,398 tons during May. Anthracite shipments during June amounted to 205,342 net tons, compared with 61,084 tons during May.

## High Wage Rate of Teamsters Raises Retail Prices

In the accompanying chart is shown how the increase in the wages of wharfmen and teamsters has exceeded in Boston even the increases in the wages of the building trades. Whereas the building wage rates have risen about 70 per cent the wharfmen and team-

sters have been forced up 115 per cent. This probably is typical of the general condition. It will be noted that the wharfmen and teamsters, though their wage increases have been large, are not even now getting startlingly high wages. These wage-rate increases, whether justified or not, account in a degree for the high cost of coal at retail.



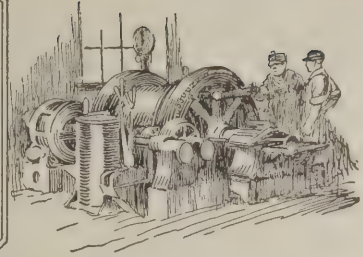
Comparison of Wages to Wharfmen and Teamsters with Cost of Living and Wages Paid in Building Trades in Boston, Mass.

Above the heavy line representing the wages paid to wharfmen and teamsters is placed the hourly wage paid between 1911 and 1924. To this is appended after 1913 the comparative rate per cent that any one wage rate bears to that ruling in 1914.





## Practical Pointers For Electrical And Mechanical Men



### Where Combination Locomotive at Mine Meets Unusual Conditions

A mining engineer recently presented an interesting haulage problem that can be solved practically in only one way. The conditions at his mine were such that coal cars from an opening near the tipple had to be transported over a short stretch of the railroad track before they could be unloaded. It was impossible to lay a mine track parallel to the railroad because a large building was on one side and a creek on the other. It was therefore necessary to use one rail of the railroad track and place another to suit the gage of the mine cars. When this was done another problem presented itself.

The haulage locomotive selected for this service was of the trolley type and therefore it was necessary to provide a trolley circuit where the locomotive was to travel. To meet the railroad rules it was impossible to install the trolley wire near enough to the railroad track to permit the use of a trolley pole of reasonable size. Hence the ordinary trolley locomotive would not meet the conditions.

A combination trolley and battery locomotive was suggested. When the locomotive would operate over the railroad track the battery power would be used but when the locomotive would be on other sections of the track both inside and outside the mines the power supply would be furnished from the trolley circuit.

Though the combination locomotive is peculiarly suited to the needs of this peculiar condition it is well to remember that it would have a place in this mine or in other mines apart from any such unusual problem having to be solved. In what follows some advantages

will be discussed that have no connection with the problem stated but would be found available in other operations. These advantages are cited so as to complete the record.

Another advantage that would not apply to the problem under discussion is as follows: Combination locomotives can be, and are, used for switching loaded cars at the bottom of shafts after the main-line motor has brought the trip to the point near the shaft where it makes a flying switch to the empty track for its trip of empties. It is also used to handle the cars on and off the cage.

Combination locomotives operate efficiently from both trolley and battery. The battery can be charged while the locomotives are operating from the trolley, except in the very low types the limited height of which does not allow room for the charging equipment.

Where a main-line motor is out of commission temporarily, the combination locomotive can take its place and keep cars moving and coal coming to the dump. Where power is not kept on the line at night the combination locomotive with the battery which has been fully charged during its operation on the trolley in the daytime can be used for the night shift to deliver men or material to any point where work has to be done, the power being furnished by the battery. Such a locomotive will soon pay for itself in general utility service alone. In case of trouble or accident, the utility locomotive is always ready to run to the scene under its own power even though the power lines may be out of commission.

In many situations, combination loco-

motives save a large investment in trolley wire, bonds and feeders by doing all the gathering and entry hauling on battery power and only operating on the trolley where the work to be done justifies the installation of wires, feeders and bonds. New mines are being laid out so that the trolley wire with its necessary feeders and bonded track is confined to the main-line hauls, the work on the cross or butt entries and in the rooms being taken care of by battery power entirely.

### Advantage of High-Voltage Distribution in Mines

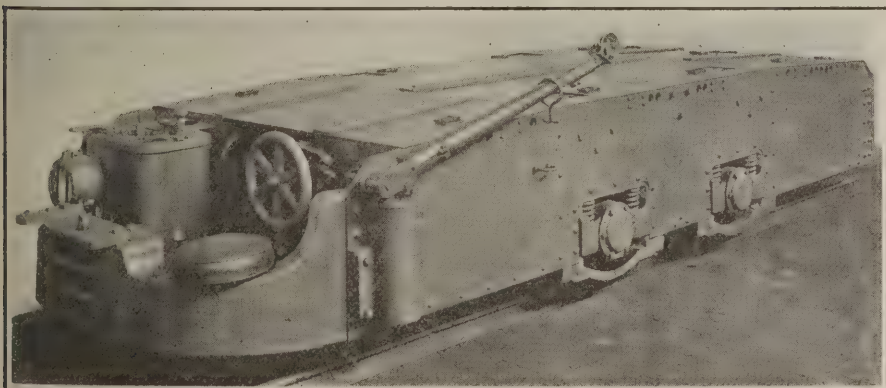
In a coal mine, an electric pump is operated at a point about a mile from the foot of the shaft. It receives its power supply from a three-phase alternating-current circuit, consisting of No. 6 copper wire. The line runs down the shaft and through the gangways to a point near the pump where it delivers 2,200-volt energy to a bank of transformers. At the transformers, the voltage is reduced to 220 volts and then supplied to the pump motor. For safety purposes it is desired to reduce the distribution voltage from 2,200 volts to 440 volts and transmit the pressure at this voltage to a bank of transformers near the pump and there reduce it to 220 volts for the motor. Is this a good idea, will the pump operate as well as at present?

A SUBSCRIBER.

The size of the motor mentioned in this problem is not stated. For this reason we will have to make several assumptions. The motor is probably an induction-type alternating-current unit and an understanding of its characteristics will no doubt help us reach some satisfactory conclusions.

Most induction motors are designed and rated with the idea that they will operate satisfactorily with 10 per cent over-voltage, or 10 per cent under-voltage. Although this is true every effort always should be made to supply induction motors with normal voltage. The torque of this type of motor decreases rapidly with even a slight reduction of voltage; for example, when the motor is supplied with a pressure 10 per cent below normal, the torque decreases to about 81 per cent.

Hence, it is important that every induction motor be connected to circuits capable of furnishing as near full normal voltage as possible. This fact is not always given due consideration, and it is not at all unusual to find coal companies investing large sums of money in bigger motors than needed, in order to get sufficient torque to



Low-Type Battery and Trolley Locomotive

One important advantage of the combination-type locomotive is that it carries its own power plant and therefore causes no voltage drop for other equipment or its own motors when operating for its batteries. Full voltage can be obtained from the battery just as long as it is not discharged unduly.



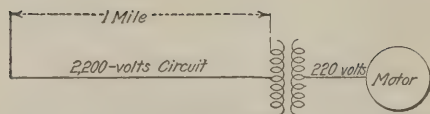


Fig. 1—High-Voltage Distribution

By transmitting the energy at 2,200 volts the low currents permit the use of small wires and the per cent voltage drop is low.

operate machinery supplied from below-voltage power circuits.

This practice of over-motoring equipment driven by electric motors introduces poor power-factors and aggravates the conditions. By decreasing the distributing voltage from 2,200 to 440 volts, the current required for a given load increases to five times its original value. The Underwriters recommendations as to wire sizes show us that a No. 6 wire is capable of carrying 50 amp. To carry five times this current, a wire slightly larger than 4-0 would be required.

Although the power to be transmitted, is not stated in our problem, it is probable that the full load current in the transmission line is about 25 amp. The same power transmitted at 440 volts would therefore require about 125 amp. It is well to note that the area of the conductor, expressed in circular mils has been increased about eight times. This is due to the greater heating capacity of the larger current.

Whether the pump motor will operate satisfactorily depends not upon the transmission voltage, but upon the voltage supplied directly to the motor. The transmission voltage may be high or low, efficient or inefficient, but if the secondary voltage of the transformers

Table Showing Voltage Drop

Volts	Amperes	Wire Size	Drop 10,000 ft.	Per Cent
2,200	25	6	100	4.5
440	125	4/0	60	13.6

is 220 volts, the motor will operate very satisfactorily. Whenever the transmission voltage is low, the transmission current is high. Unless large conductors are used for carrying heavy currents the voltage drop in the transmitting circuit will be high, and the transformers will not receive the proper primary voltage. Usually when voltages lower than normal are furnished to a transformer the secondary circuit supplying the load has a correspondingly low pressure.

Assuming a simple circuit 10,000 ft. long supplied first by 2,200-volt energy, and secondly supplied by 440-volt energy. In transmitting 25 amp. of current at 2,200 volts over a No. 6 wire, the drop is above 4.5 per cent. The same power transmitted at 440 volts over a 4-0 wire has a drop of 13.6 per cent. Consequently, trans-

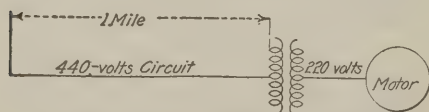


Fig. 2—An Expensive Circuit

Unless very large conductors are used the power loss in the line and the voltage drop is excessive. It is also unusual to transform from 440 to 220 volts. The cost of the transformers and the transformer power losses generally warrant buying a 440-volt motor.

formers supplied from the 440-volt line will receive less than the normal 440 volts and unless sufficient transformer taps are supplied in the transformer winding the secondary voltage supplying the motors will be abnormally low.

## Using Special Wheels for Polishing Materials

If a very high polish is required on a piece of material it can be obtained by buffing. Wheels used for this work are usually made of felt. There are many kinds of felt wheels on the market, Mexican gray felt being the most popular. It is relatively cheap, yet gives good service. For best results a buffing compound should be

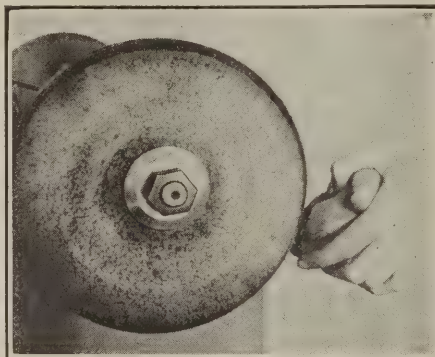


Fig. 1—Applying Buffing Compound

To secure a high polish on a piece of material a felt wheel prepared with a buffing compound, usually of crocus is used.

applied to the wheel, as in Fig. 1. Fig. 2 shows a piece of material being polished on a soft wheel in preparation for the buffing operation. The composition used on these buffing wheels for general work is usually in the form of sticks or cakes. As a rule these cakes are compressed tallow or some other heavy grease, containing a polishing material such as tripoli, crocus, rouge, flour, emery, etc. Polishing and buffing

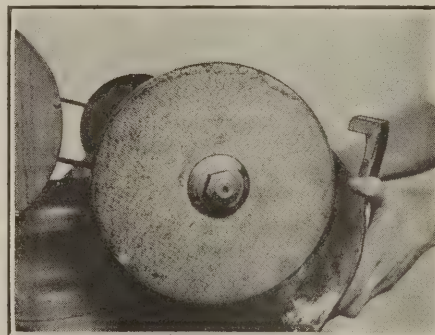


Fig. 2—Preparing Material Before Using Buffing Wheel

By first polishing the material on a canvas wheel the buffing operation can be made more satisfactory.

wheels are made in sizes ranging from 6 to 18 in. diameter and  $\frac{1}{2}$  to  $2\frac{1}{2}$  in. thick.

A good cement for cementing emery cloth to wooden wheels consists of  $4\frac{1}{2}$  lb. of rosin, 3 lb. of paraffin, and 9 oz. of vaseline. The ingredients are melted and mixed thoroughly. The surface of the wheel is heated and the mixture spread on the wheel. The emery cloth is then rubbed down to

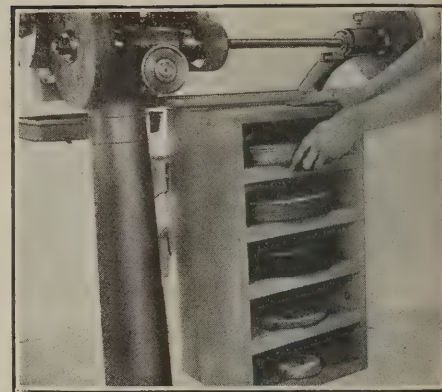


Fig. 3—Box for Grinding-Machine Parts

A cabinet provided near the stand will make it much easier for the workman to put the supplies in a safe place.

exclude all air sacs. Allow the cement an hour or two to set, and it is ready for use.

To protect wheels from severe misuse they should be stored properly when not in use. In Fig. 3 is shown an inexpensive means of storing grinding-stand supplies in a convenient but substantial box. It is much better to arrange some kind of protection for these supplies than to permit them to be abused by allowing them to lie on the floor. With the storage case near the machine there is always a better chance to have the wheels put away properly.

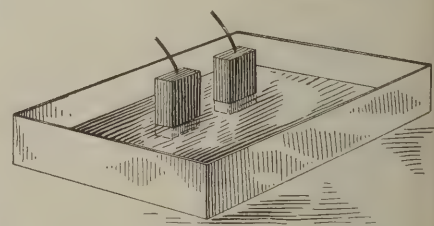
G. H. RADEBAUGH.

## Prevents Burning of Brushes

The application of oil on the commutator of electric machines will often stop sparking. This is especially true of machines fitted with carbon brushes when the spring tension is too great. The oil temporarily reduces friction and heat but should be used sparingly.

A few weeks ago we were having considerable trouble with some brushes on our generator and I put about  $\frac{1}{2}$  in. of engine oil in a tray and placed it over one of the steam pipes in the engine house. The brushes were stood on end with the beveled edges in the oil. After the brushes had stood for a few hours they were wiped and again put on the machine. The sparking stopped immediately. I find that this treatment allows these brushes to absorb enough lubricant to operate satisfactorily for almost six months. The treatment must be repeated occasionally as the brushes wear down because the oil does not penetrate very deeply.

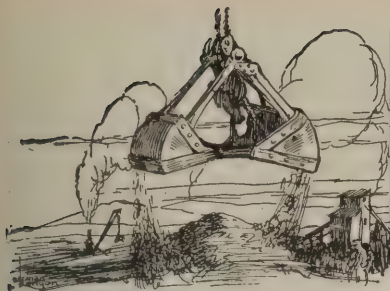
ELECTRICIAN.



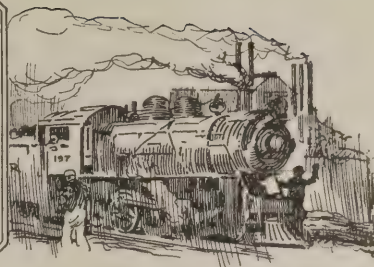
Lubricating Generator Brushes

By letting the brushes stand in a pan containing about  $\frac{1}{2}$  in. of lubricating oil they soak up sufficient lubricant to keep them from causing any undue sparking at the commutator. This process has to be repeated about every six months because the oil does not penetrate very deeply into the carbon.





# Production And the Market



## Hesitant Tendency Holding Back Expected Revival In Bituminous-Coal Business

Clutching at any straw within reach, the coal industry rejoices that the long-drawn-out convention of the Democrats has finally come to an end and heaves a sigh of relief that the choice of a candidate fell to one not likely to indulge in rampages for regulation if his campaign for election should prove successful. Whether this is the herald of the early approach of the long hoped-for upturn in business or not it marks the passing of what in some quarters has been regarded as one of the obstacles in the path of business resumption. What the others may be, other than the usual hesitant attitude while waiting to see which way the political wind will blow, doesn't seem to be clear. At any rate, caution continues to dominate the coal business in the leading markets of the country, consumers showing a reluctance to buy except for immediate needs or when distress coal may be picked up at a sacrifice.

### Kanawha Mines Working with Lower Scale

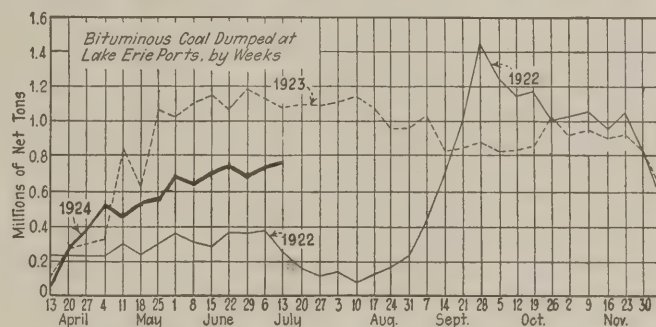
Since twenty-six operations in the Kanawha field last week posted a scale of wages cutting tonnage rates to the same level as the 1917 rate and placing day wages somewhat above the basis of that scale six companies have resumed production. One of the most encouraging developments of recent weeks is the announcement that six textile plants are about to reopen—three in Massachusetts and a like number in Connecticut.

**Coal Age Index** of spot prices of bituminous coal sticks uncomfortably close to the unprofitable low level of recent weeks, the figure for July 14 having receded to 162, the corresponding price for which is \$1.96.

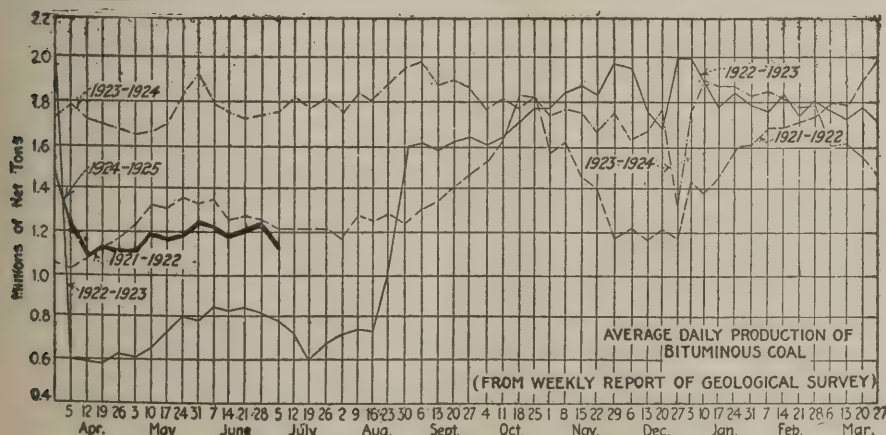
The holiday week end played havoc with traffic at Hampton Roads, dumpings of coal for all accounts during the week ended July 10 totaling 236,520 net tons, a slump of more than 165,000 tons from the previous week, when 401,935 net tons was dumped. Coal dumped at Lake Erie ports during the week ended

July 12, according to the Ore & Coal Exchange, was as follows: Cargo, 731,438 net tons; fuel, 48,062 tons. The totals for the preceding week were 712,277 net tons of cargo coal and 40,966 tons of fuel coal.

Bituminous production also received a severe setback because of the holiday, output for the week ended July 5, according to the Geological Survey, totaling only 5,755,000 net tons, compared with corrected returns of 7,371,000 tons for the previous week. Anthracite output likewise slumped, the figures being 1,296,000 net tons. This compares with 1,918,000 tons produced during the preceding week, according to revised returns.



The customary summer quiet characterizes practically all branches of the anthracite trade. Demand, as usual, is best for stove coal, being sufficient to take care of the output. Egg and chestnut also are moving well, though dependent in a degree on the call for the more popular stove. Pea, however, is causing some difficulty, many of the larger companies stocking it. Steam sizes are in weak demand. Independents' prices hold fairly firm on stove, but occasional concessions are made to move the less active sizes. A number of the smaller independent operations, it is reported, have not resumed production since the holiday because of the falling off in demand.



### Estimates of Production

(Net Tons)

#### BITUMINOUS

	1923	1924
June 21 .....	10,422,000	7,202,000
June 28 (a) .....	10,458,000	7,371,000
July 5 (b) .....	8,742,000	5,755,000
Daily average .....	1,748,000	1,151,000
Cal. yr. to date (c) .....	279,553,000	231,971,000
Daily average to date .....	1,770,000	1,469,000

#### ANTHRACITE

June 21 .....	2,042,000	1,823,000
June 28 .....	2,105,000	1,918,000
July 5 .....	1,580,000	1,296,000
Cal. yr. to date .....	52,749,000	46,921,000

#### COKE

June 28 (a) .....	399,000	125,000
July 5 (b) .....	376,000	95,000
Cal. yr. to date (c) .....	10,378,000	6,177,000

(a) Revised from last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.



### Midwest Lives on Hope

Nobody made any money out of the Midwest coal market during the past week. Trade could hardly be any deadier. Last week's slight increase in Illinois, Indiana and Kentucky production was not at all well received. A slight firming up of steam sizes was noticeable for a few days, but even that did not last. Domestic business is absolutely flat. The trade continues to count on inevitable business cropping up any day.

Smokeless business is sagging a little more. The \$2 mine price on mine run is not attracting anybody and the little coal that is moving is forced at less than that in spite of circular. Anthracite also is dead. The first real hot weather of the summer in the Chicago region and continued heat in the belt from Des Moines and St. Louis east across Iowa, Illinois and Indiana kills about all the retail yard business there is.

Southern Illinois producers are not expecting much from the new move in the Northwest to get the I.C.C. to reconsider its recent rate decision which hiked the cost of shipping by rail into Minnesota. They are counting on the increase to take effect Aug. 21, as scheduled, and expect to see some business taken away from them by the docks.

Continued quietness prevails over the entire southern

Illinois field. Everything is practically at a standstill, outside of a little railroad coal. "No bills" of all sizes are on hand and mines that a few weeks ago were getting a couple of days a week are practically idle. A little movement to the Northwest is noted occasionally on lump and egg. The same conditions prevail in Duquoin and Jackson County.

The Mt. Olive field is shipping on a few railroad contracts to the Northwest. The Standard field also is at its worst. Everything seems to have come to a dead stop. All sizes are on track and coal is sold below cost and the trade is hopeful that things will soon begin to pick up.

In St. Louis the usual midsummer vacation period has just about killed the retail coal business. There is absolutely nothing doing, except the public-school business and a little apartment storage. Country domestic begins to show signs of a little life, but country steam is pretty well shot.

### Kentucky Is Whistling

Generally speaking business at Louisville is showing some signs of life, there being better inquiry and better general outlook, but there hasn't been much increase in tonnage. The steel and metal-working industries continue buying slowly along with the auto, ice and cold-storage interests, while railroad consumption appears to be a shade off and utility movement would not indicate that the utilities are

### Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern		Market Quoted	July 16 1923	June 30 1924	July 7 1924	July 14, 1924†	Midwest		Market Quoted	July 16 1923	June 30 1924	July 7 1924	July 14 1924†
Smokeless lump.....	Columbus....		\$6.00	\$3.85	\$3.85	\$3.75@4.00	Franklin, Ill. lump.....	Chicago.....	\$2.90	\$2.75	\$2.75	\$2.50@3.00	
Smokeless mine run.....	Columbus....		3.25	2.20	2.20	2.10@2.35	Franklin, Ill. mine run.....	Chicago.....	3.00	2.35	2.35	2.25@2.50	
Smokeless screenings.....	Columbus....		2.90	1.30	1.30	1.10@1.50	Franklin, Ill. screenings....	Chicago.....	1.65	1.80	1.70	1.60@1.80	
Smokeless lump.....	Chicago.....		6.10	3.60	3.60	3.50@3.75	Central, Ill. lump.....	Chicago.....	2.60	2.35	2.35	2.25@2.50	
Smokeless mine run.....	Chicago.....		3.60	2.00	1.85	1.75@2.00	Central, Ill. mine run.....	Chicago.....	2.10	2.10	2.10	2.00@2.25	
Smokeless lump.....	Cincinnati.....		6.00	3.85	3.85	3.50@4.00	Central, Ill. screenings....	Chicago.....	1.55	1.65	1.65	1.60@1.75	
Smokeless mine run.....	Cincinnati.....		3.35	1.80	1.80	1.65@2.00	Ind. 4th Vein lump.....	Chicago.....	3.35	2.85	2.60	2.50@2.75	
Smokeless screenings.....	Cincinnati.....		3.00	1.10	1.10	1.25@1.50	Ind. 4th Vein mine run.....	Chicago.....	2.60	2.35	2.35	2.25@2.50	
*Smokeless mine run.....	Boston.....		5.35	4.30	4.30	4.25@4.40	Ind. 4th Vein screenings....	Chicago.....	1.60	1.80	1.70	1.60@1.80	
Clearfield mine run.....	Boston.....		2.35	1.95	1.90	1.60@2.00	Ind. 5th Vein lump.....	Chicago.....	2.85	2.35	2.35	2.25@2.50	
Cambria mine run.....	Boston.....		2.85	2.50	2.35	2.00@2.40	Ind. 5th Vein mine run.....	Chicago.....	2.10	2.10	2.10	2.00@2.25	
Somerset mine run.....	Boston.....		2.60	2.15	2.15	1.75@2.15	Ind. 5th Vein screenings....	Chicago.....	1.45	1.60	1.55	1.50@1.65	
Pool 1 (Navy Standard)....	New York....		3.50	2.70	2.70	2.50@2.90	Mt. Olive lump.....	St. Louis....	3.00	2.85	2.85	2.75@3.00	
Pool 1 (Navy Standard)....	Philadelphia..		3.60	3.00	2.80	2.60@3.00	Mt. Olive mine run.....	St. Louis....	2.00	2.50	2.50	2.50	
Pool 1 (Navy Standard)....	Baltimore....						Mt. Olive screenings.....	St. Louis....	1.75	2.00	2.00	2.00	
Pool 9 (Super. Low Vol.)....	New York....		2.55	2.20	2.15	1.90@2.35	Standard lump.....	St. Louis....	2.35	2.15	2.15	2.00@2.35	
Pool 9 (Super. Low Vol.)....	Philadelphia..		2.70	2.20	2.15	1.95@2.35	Standard mine run.....	St. Louis....	1.85	1.80	1.80	1.75@1.85	
Pool 9 (Super. Low Vol.)....	Baltimore....		2.50	1.85	1.85	1.80@1.90	Standard screenings.....	St. Louis....	1.20	1.45	1.45	1.40@1.50	
Pool 10 (H.Gr. Low Vol.)....	New York....		2.25	1.85	1.85	1.65@2.00	West Ky. lump.....	Louisville..	2.30	2.00	2.00	2.00@2.25	
Pool 10 (H.Gr. Low Vol.)....	Philadelphia..		2.25	1.85	1.75	1.65@1.90	West Ky. mine run.....	Louisville..	1.70	1.60	1.60	1.50@1.75	
Pool 10 (H.Gr. Low Vol.)....	Baltimore....		2.20	1.65	1.65	1.60@1.70	West Ky. screenings.....	Louisville..	1.20	1.25	1.25	1.15@1.35	
Pool 11 (Low Vol.).....	New York....		1.85	1.60	1.60	1.40@1.75	West Ky. lump.....	Chicago.....	2.40	1.85	1.95	1.90@2.25	
Pool 11 (Low Vol.).....	Philadelphia..		1.85	1.50	1.45	1.35@1.60	West Ky. mine run.....	Chicago.....	1.15	1.60	1.60	1.50@1.75	
Pool 11 (Low Vol.).....	Baltimore....		2.05	1.55	1.55	1.50@1.60							
High-Volatile, Eastern							South and Southwest †						
Pool 54-64 (Gas and St.)...	New York....		1.75	1.50	1.50	1.35@1.65	Big Seam lump.....	Birmingham..	3.25	3.20	3.20	3.10@3.30	
Pool 54-64 (Gas and St.)...	Philadelphia..		1.60	1.55	1.50	1.40@1.60	Big Seam mine run.....	Birmingham..	1.95	2.10	1.80	1.50@2.10	
Pool 54-64 (Gas and St.)...	Baltimore....		1.75	1.45	1.45	1.40@1.50	Big Seam (washed).....	Birmingham..	2.35	2.20	2.00	1.75@2.25	
Pittsburgh sc'd gas.....	Pittsburgh..		2.65	2.40	2.40	2.30@2.50	S. E. Ky. lump.....	Chicago.....	2.85	2.10	2.10	2.00@2.25	
Pittsburgh gas mine run....	Pittsburgh..			2.10	2.10	2.00@2.25	S. E. Ky. mine run.....	Chicago.....	2.10	1.60	1.50	1.25@1.75	
Pittsburgh mine run (St.)..	Pittsburgh..		1.95	1.85	1.85	1.75@2.00	S. E. Ky. lump.....	Louisville..	2.85	2.10	2.10	2.00@2.25	
Pittsburgh slack (Gas)....	Pittsburgh..		1.40	1.20	1.20	1.15@1.25	S. E. Ky. mine run.....	Louisville..	2.00	1.55	1.55	1.35@1.75	
Kanawha lump.....	Columbus....		3.00			2.00@2.25	S. E. Ky. screenings....	Louisville..	1.05	.95	.95	.85@1.10	
Kanawha mine run.....	Columbus....		1.85			1.40@1.60	S. E. Ky. lump.....	Cincinnati...	3.10	2.50	2.50	2.25@2.75	
Kanawha screenings.....	Columbus....		1.10			.90@1.10	S. E. Ky. mine run.....	Cincinnati...	1.85	1.45	1.45	1.25@1.65	
W. Va. lump.....	Cincinnati...		3.10	2.25	2.25	2.00@2.25	S. E. Ky. screenings....	Cincinnati...	1.00	.90	.90	.75@1.10	
W. Va. gas mine run.....	Cincinnati...		1.85	1.40	1.40	1.25@1.50	Kansas lump.....	Kansas City..	4.00	4.50	4.50	4.50	
W. Va. steam mine run.....	Cincinnati...		1.85	1.40	1.40	1.25@1.50	Kansas mine run.....	Kansas City..	3.25	3.50	3.50	3.50	
W. Va. screenings.....	Cincinnati...		1.05	.85	.85	.80@1.10	Kansas screenings.....	Kansas City..	2.60	2.50	2.50	2.00	
Hoeking lump.....	Columbus....		2.75	2.45	2.45	2.25@2.65							
Hoeking mine run.....	Columbus....		1.85	1.70	1.70	1.60@1.85							
Hoeking screenings.....	Columbus....		1.25	1.35	1.35	1.30@1.45							
Pitts. No. 8 lump.....	Cleveland...		2.50	2.35	2.35	2.00@2.75							
Pitts. No. 8 mine run.....	Cleveland...		2.00	1.85	1.90	1.85@1.90							
Pitts. No. 8 screenings....	Cleveland...		1.30	1.10	1.10	1.05@1.15							

† Gross tons, f.o.b. vessel, Hampton Roads.  
\* Advances oner previous week shown in **heavy type**, declines in *italics*.

\* Gross tons, f.o.b. vessel, Hampton Roads.

† Advances over previous week shown in heavy type, declines in italics.

### Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

		Market Quoted	Freight Rates	July 16, 1923		July 7, 1924		July 14, 1924†	
				Independent	Company	Independent	Company	Independent	Company
Broken.....	New York.....		\$2.34		\$7.75@8.35		\$8.00@8.95		\$8.00@8.95
Broken.....	Philadelphia..		2.39		7.00@8.10		8.80@8.95		8.80@8.95
Egg.....	New York.....		2.34	\$8.50@12.00	8.00@8.35	\$8.75@9.00	8.55@8.95	\$8.75@9.00	8.55@8.95
Egg.....	Philadelphia..		2.39	9.25@11.00	8.10@8.35	8.90@9.60	8.90@8.95	8.90@9.60	8.90@8.95
Egg.....	Chicago.....		5.06	8.50@12.00	7.25@7.45	7.99@8.10	7.94@8.00	7.99@8.10	7.94@8.00
Stove.....	New York.....		2.34	8.50@12.00	8.00@8.35	9.00@9.25	8.55@9.20	9.00@9.25	8.55@9.20
Stove.....	Philadelphia..		2.39	9.25@11.00	8.15@8.35	9.25@9.90	8.95@9.10	9.25@9.90	8.95@9.10
Stove.....	Chicago.....		5.06	8.50@12.00	7.25@7.45	8.30@8.40	8.24@8.34	8.30@8.40	8.24@8.34
Chestnut.....	New York.....		2.34	8.50@12.00	8.00@8.35	8.75@9.00	8.55@9.05	8.60@9.00	8.55@9.05
Chestnut.....	Philadelphia..		2.39	9.25@11.00	8.15@8.35	8.75@9.70	8.90@8.95	8.75@9.70	8.90@8.95
Chestnut.....	Chicago.....		5.06	8.50@12.00	7.25@7.45	8.08@8.23	8.18@8.24	8.08@8.23	8.18@8.24
Range.....	New York.....		2.34		8.30		8.80		8.80
Pea.....	New York.....		2.22	6.75@8.00	6.00@6.30	4.50@5.50	5.50@6.00	4.50@5.25	5.50@6.00
Pea.....	Philadelphia..		2.14	7.00@7.50	6.15@6.20	5.75@6.25	5.75@6.00	5.75@6.25	5.75@6.00
Pea.....	Chicago.....		4.79	7.00@8.50	5.30@5.65	5.13@5.45	5.36@5.91	5.13@5.45	5.36@5.91
Buckwheat No. 1.....	New York.....		2.22	2.75@3.50	3.50@4.15	2.00@2.75	3.00@3.15	2.00@2.50	3.00@3.15
Buckwheat No. 1.....	Philadelphia..		2.14	2.75@3.50	3.50	2.50@3.00	3.00	2.50@3.00	3.00
Rice.....	New York.....		2.22	1.80@2.50	2.50	1.50@2.15	2.00@2.25	1.50@2.15	2.00@2.25
Rice.....	Philadelphia..		2.14	1.75@2.50	2.50	2.00@2.25	2.25	2.00@2.25	2.25
Barley.....	New York.....		2.22	1.25@1.50	1.50	1.10@1.50	1.50	1.00@1.50	1.50
Barley.....	Philadelphia..		2.14	1.15@1.50	1.50	1.50	1.50	1.50	1.50
Birdseye.....	New York.....		2.22		1.60	1.10@1.50	1.60	1.10@1.50	1.60

\* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.





Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

	1924			1923
	July 14	July 7	June 30	July 16
Index .....	162	164	166	198
Weighted average price....	\$1.96	\$1.99	\$2.01	\$2.40

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board.

rushed. General movement from eastern Kentucky has been quite fair, in spite of the fact that the movement to the Lakes doesn't show up as well as that of last year.

Retailers have been getting a better volume of business, but locally and in districts close to coal fields the retailers appear to be buying for immediate use and making no effort toward yard stocking. Movement to the Southeastern textile districts continues dull, as the textile trade is not busy. However, there has been some very fair scattered movement to Michigan and as far as Canada, moving over three and four railroads in some instances, and some movement West and Northwest. Prices show no change.

In western Kentucky the situation is not inspiring. Although four of the St. Bernard mines are trying to run non-union, the production of the field is not picking up much. The strike paralysis grips most of that end of the state. The strip mines are doing fairly well, however.

Smokeless originating in southern West Virginia occupies a relatively stronger position than high volatile. Smokeless output is about 700,000 tons a week, nearly half of which is coming from the Pocahontas region. There continues to be a strong demand for low volatile lump and egg. There is not much activity in the buying of high-volatile fuels except for the tonnage moving to lake points.

### Northwest Idles Along

Trade is still dull at Duluth. Kentucky lump has dropped to \$6, splint run of pile is up to \$5 and Pocahontas mine run is off to \$5.25. These prices are not considered as indicative of anything but slight readjustment. The de-

mand from steam plants which have been compelled to operate because of the low water has fallen off and docks are feeling the loss of this trade.

Railroads are taking lots of dock coal. Shipments last month ran to 13,401 cars. In all about 90,000 cars went out the first six months of this year as compared with 66,000 in the first six months of last year.

The docks will have to hurry if they are to have enough coal to go around this year, according to comparative figures of the past few years. About 7,000,000 more tons is needed, as only about 2,000,000 tons of all sorts of coal has been brought up so far, and about 3,000,000 tons was on the docks when the season opened.

Anthracite is very dead. It does not seem possible to make the buyers start laying in their winter's coal.

The general free-for-all on prices at the Twin Cities seems to have reached the point where general blood-letting was not beneficial to any of the patients, and there is something of a stiffening. Dock prices are around \$3.75 for screenings and \$5.75 for Youghiogheny lump and \$5.25 for Hocking lump. All signs point to a reaction that will give the coming autumn a better demand than has been experienced in several seasons. Commercial and industrial conditions are fairly promising and crops generally seem to be in good shape.

The Milwaukee coal market is at a normal summer level, which means monotonous dullness. Hopes of a betterment during July have been dissipated. There have been no changes in prices. Cargo receipts of coal by lake since the opening of navigation have passed the million-ton mark, the aggregate up to date being 329,538 tons of hard coal and 699,083 tons of soft coal, or 1,028,621 tons in all. This total is about 50 per cent less than the total up to this date last year.

### West Generally Quiet

Little activity is reported through the Southwest. The demand for threshing coal, as compared with that of other years, has been good, but this takes a small volume of fuel. During June there was some storing of domestic coal, principally semi-anthracite, by householders. Dealers, however, apparently were buying only to supply the current demand. This remains steady in spite of a 50c. increase in the retail price of Arkansas semi-anthracite to \$11.35. No change has occurred in wholesale quotations, which remain \$5.50@\$6 for lump, \$3.25@\$3.75 for mine run, and \$2 for screenings.

Kansas coal prices are: Lump, \$4.50; nut, \$4; mine run, \$3.50; and screenings, \$2.50. Henryetta (Okla.) coal is: Lump, \$4; nut, \$3.50; mine run, \$3; and screenings, \$2.

Very little change is noted in Colorado except for a slight pick-up in the movement of coke. Mines worked on an average of 20 hours last week and attributed 46 per cent of the working time lost to "no market." Prices remain unchanged.

Salt Lake City coal dealers have increased their prices as follows: Utah lump, \$8@\$8.75; domestic lump, \$7.50@\$8.50; nut, \$7@\$8; pea coal and slack remain \$6 and \$5 respectively. Stove coal, which has been retailing at \$7.25, will not be made hereafter. The announcement of this increase has increased the storage orders slightly.

### Bottom Drops Out at Cincinnati

The bottom has dropped out of the Cincinnati market. Steam buyers are not even interested in very low spot quotations, most of them having ample unused reserves, due to suspended or considerably reduced operations. Domestic retailers, who had placed large orders for July delivery in the belief that the usual buying by the householder would be in evidence this month, are canceling most of these orders because the customary business has not shown up for them, while there is an almost complete dearth of new orders. The usual volume of thresher's coal is going out, but the farmers are not buying winter supplies.

Buying at Columbus is limited to present needs and there is little to break the monotony. Domestic demand has slumped. What coal is moving is mostly of the smokeless varieties and splints. Hocking and Pomeroy grades are exceedingly dull. Retail prices are fairly steady at former levels. Little change has taken place in the steam business. Many of the heavy users are not in the market, as consumption in many lines has been reduced owing to industrial conditions. Utilities and railroads are the best



users. Contracting is not much, as most of the buyers are picking up cheap consignments of distress coal. School coal is moving in fair quantities. Lake trade is steady, although there is a plentiful supply of bottoms.

Demand is lackadaisical at Cleveland. Despite various quantities of distress coal appearing from time to time, spot prices continue stable. Business conditions are no better; if anything, they are slightly worse, judged by the barometer of railroad traffic. The producing end of the trade is optimistic in the belief that the next change in conditions will be upward, because fuel preparations for the coming autumn and winter must shortly begin. While some more small mines have closed, there are reports of resumption by some of the larger companies, one company with two mines of 1,800 tons per day capacity starting up this week.

Further stagnation has hit the Pittsburgh market. Even local consumption has declined enough to make a difference in the total operation of the district, which has been running at but little above one-eighth of capacity, against about one-fifth in April and May. Of domestic demand there are as yet practically no signs.

Industries at Buffalo that have been losing ground considerably of late find no consolation from the coal trade. It is at the bottom and seems to be finding a new and lower bottom now and then.

### New England Trade Light and Fitful

To New England buyers there seem to be no present inducements. The industries are under severe curtailment because of lack of business, and not yet is there enough prospect of better markets to warrant purchases of fuel beyond ordinary summer reserves. A few of the smaller textiles have so reduced their stocks of coal that they are making inquiry for September and October delivery, but there is no volume to this business and it will only replace the tonnage which still other plants of the same character will stop taking.

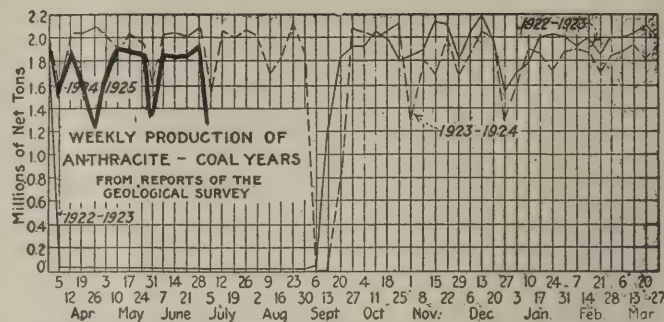
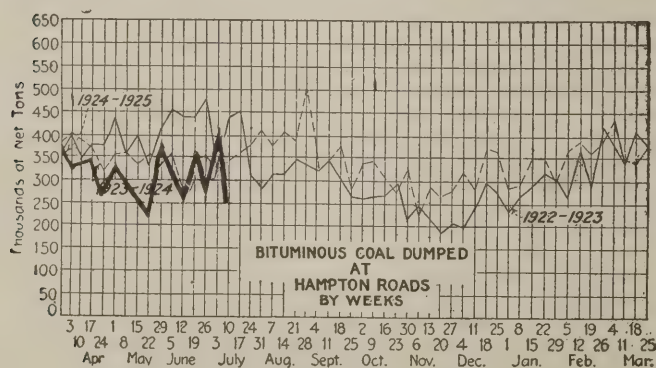
At Hampton Roads there is no special change. Accumulations are only moderate, but spot sales are by no means dependable. It is only the staple contract trade that is absorbing its share of current output, and there is still some fluctuation of prices in the effort to make sales that will move demurrage coal. No. 1 Navy standard coals can be bought at \$4.25@4.40 per gross ton f.o.b. vessel, with second grades at 15@35c. less. The larger agencies are following a very close-hauled policy in the effort to avoid being pressed to move current output.

For inland delivery at this end there is little to report. The dullness that has now spread over so many months has discouraged for the most part the practice of forcing cargoes on a reluctant trade.

All-rail from central Pennsylvania there is a little business being done by standard shippers who are both anxious to keep mines in operation at least a part of the time and are willing to meet conditions. A few of the quality grades from Cambria County are selling well down to \$2 per net ton at the mines, but the market in this territory is still restricted to points well away from tidewater.

### Demand Weak in Atlantic Seaboard Markets

Lack of demand, low prices and an accumulation of coal characterize the New York tidewater market. There have been daily averages of between 1,500 and 1,600 cars of coal at the local piers, with the result that in order to save demurrage charges some shippers find it necessary to let



their holdings go at less than current quotations. Many soft spots are reported, but market quotations are about on last week's basis. Reserve stocks are dwindling and consumers continue to withstand the warnings to replenish, hurled at them from all directions. Demand along the line continues slow and uninteresting. Spot coal buyers are scarce and most of the output moves on contract.

The holiday shutdown was of scant help to the Philadelphia market. Despite the lack of buying, there are evidences of better times. Shippers report an increase of inquiries for prices lately, and have been able to develop some business from them. There has also been a stir among the utility consumers. Prices remain at last week's quotations, and seem to be a trifle firmer. The market for tide coal is unchanged; bunkering, the chief business, is only moderate in volume.

The trade at Baltimore is about on the same level as for two months past. Encouragement is taken in the gradual but sure depletion of surplus industrial stocks. The three-day holiday caused a depression in the export trade, only three ships clearing with coal cargoes up to July 10, but the month bids fair to compare favorably with June.

The Birmingham market continues sluggish. There is little demand for any grade of coal, the spot market affording an outlet for only a small tonnage of either steam or domestic sizes. Consumers are buying only immediate requirements and there is practically no stocking by any of the contract consumers.

### Anthracite Feels Dull Season

The anthracite market at New York is comparatively quiet. The demand depends greatly upon the call for stove coal. Egg and chestnut move freely, but they are taken mostly in conjunction with the other large sizes. Independent broken coal is practically out of this market, many operators finding it necessary to break it in order to prevent accumulation. Independent operators are able to get about \$9.50 for straight lots of stove coal, but when taken with either egg or chestnut quotations are 25c. to 50c. lower. Pea coal is causing some trouble to certain of the smaller operators and some of the larger companies are sending it to stockpiles. There is little call for steam sizes and independent product is being quoted at lower figures by those small operators who continue to produce coal.

The situation in Philadelphia has grown quieter. In another week some curtailment of mining by independents probably will be necessary. The dealers' yards are filled with all sizes, and even stove is not in such demand as it was a few weeks ago. Steam sizes are so extremely slow that some shippers are selling buckwheat below \$2.50 in order to get it out of the way, and rice is in almost the same position. Barley is a trifle better, but there is even a slowing down in the demand for this size.

The raise in hard-coal prices on July 1 seemed to have very little effect on trading at Baltimore. The usual number of July orders are being placed in the majority of cases, although some dealers complain that they are considerably behind the annual average.

### Car Loadings, Surplusages and Shortages

	Cars Loaded	
	All Cars	Coal Cars
Week ended June 28.....	908,355	144,759
Previous week.....	903,700	140,807
Week ended June 30, 1923.....	1,021,471	185,324

	Surplus Cars		Car Shortage	
	All Cars	Coal Cars		
June 30, 1924.....	356,389	162,343		
Pre iou week.....	359,644	167,315		
June 30, 1923.....	63,636	3,896		



## Foreign Market And Export News

### British Market Continues to Improve; High-Cost Operations Close

The south Wales coal market has improved only slightly during the last week, and business is still far below the capacity of the industry. European exchanges are steadier and some of the higher cost pits have been closed, so that production expenses on the whole are slightly lower. The Welsh operators are emphatic that any reduction in price is out of the question on account of the increased working costs under the new agreement. In some cases they are endeavoring to speed up production at the newer pits by the adoption of the two-shift system, but the miners are strenuously opposing any such innovation, and it is likely that sectional strikes or lockouts will result. The Miners' Federation seems to be in rather bad odor and is losing members, so that the agents are getting busy on a campaign to force every miner in Wales into the Federation. Notices soon to be given in the Rhondda district will affect about 45,000 men. Inquiries from Belgium and France have increased, and there is some more business with Italy.

Business in the Newcastle market is slow; the collieries are engaged mainly in filling old contracts. It is stated that the Paris gas works has contracted for the supply of 70,000 tons of Durham gas coals at 20s., delivery to be over the rest of the year.

Coal output by British mines during the week ended June 28, according to a cable to *Coal Age*, was 5,170,000 tons, compared with 5,173,000 tons produced during the previous week.

#### Trade Slows at Hampton Roads; Optimism Wanes

The situation at Hampton Roads is extremely dull, with comparatively no demand for spot coal and with the market showing a decided tendency to weaken. Some coastwise movement has been noted, but on contract, while foreign business continues in the slump

it struck two weeks ago when large orders for Brazil were completed.

General shipping appears to have struck a period of dullness which is reflected in poor bunker trade. Supplies are accumulating at the piers, the post-holiday production having begun generally in the mines serving this terminus. Shippers are not optimistic over the immediate outlook.

#### French Market Maintains Favorable Position

The situation of the French collieries has now been favorable for several months, although there was a slight unsettlement when the rates of sterling depreciated to 67-68 fr., thus putting British and French coals on a fairly level price. But since May 8 the pound has recovered and the price of these two fuels has shifted to the advantage of the latter. Therefore, if French coal seems to be well sold at present, this is due more to a slackening of output than to a question of price. Activity in household coal is rather good, so that few disposals are recorded outside of contracts.

There is fair inquiry for British anthracites on the Paris market, in spite of the prices being still affected by the high value of sterling.

In Belgium, house coals are well sustained while the industrial coal market is easier for the same reasons as prevail in France, and there is a disposition to take a hopeful view regarding the possible maintenance of prices in the autumn.

With the stoppage of the canals and a rather short supply of boats, freight is higher at 22 fr. Bethune-Paris.

Deliveries of indemnity fuels during May to France and Luxemburg included 243,400 tons of coal, 365,300 tons of coke and 333,900 tons of lignite briquets, a total of 642,600 tons, as compared with 1,301,100 tons in April.

The supply of indemnity coke to the

O.R.C.A. for the first twenty-four days of June was 312,278 tons, a daily average of 13,000 tons, showing an increase over the May deliveries and on the early part of June.

#### Export Clearances, Week Ended July 12, 1924

FROM PHILADELPHIA		Tons
For New Brunswick:		
Am. Schr. Georgia D. Jenkins for		
St. John		
FROM BALTIMORE		
For Italy:		
Jap. Str. Hofuku Maru	7,998	
FROM HAMPTON ROADS		
For Argentina:		
Ital. Str. Campania for Buenos		
Aires	6,415	
For Brazil:		
Br. Str. Pilar de Larrinaga for		
Rio de Janeiro	8,074	
Ital. Str. Valsavara for Rio de		
Janeiro	6,921	
Ital. Str. Recca for Rio de Janeiro		
Jap. Str. Glasgow Maru for Rio de		
Janeiro	7,792	
For Canada:		
Du. Str. Spar for Montreal	5,601	
Swed. Str. Innaren for Montreal	5,516	
For Africa:		
Dan Str. Kina for Dakar	7,626	
For Cuba:		
Br. Str. Berwindmoor for Havana	8,010	
Nor. Str. Krosfond for Santiago	2,001	
Br. Str. Harald Casper for Havana	3,842	
For Dominican Republic:		
Br. Str. Lindenhall for Puerto La		
Plata	5,398	
For Italy:		
Ital. Ignazio Florio for Genoa	7,741	
Ital. Str. Monte Nero for Porto		
Ferrajo	6,966	
Amer. Str. Wabash for Genoa	5,699	
Amer. Str. Benmore for Genoa	2,287	
For Spain:		
Amer. Str. Jalapa for Gibraltar	4,975	
For Straits Settlements:		
Amer. Str. Half Moon for Singa-		
pore	5,745	

#### Hampton Roads Pier Situation

N. & W. Piers, Lamberts Pt.:		July 3	July 10
Cars on hand	1,238	1,377	
Tons on hand	74,708	97,819	
Tons dumped for week	142,164	86,300	
Tonnage waiting	20,000	12,000	
Virginian Piers, Sewalls Pt.:			
Cars on hand	1,551	1,701	
Tons on hand	115,200	122,850	
Tons dumped for week	91,037	65,031	
Tonnage waiting	167	15,515	
C. & O. Piers, Newport News:			
Cars on hand	1,337	1,865	
Tons on hand	69,036	96,160	
Tons dumped for week	125,668	59,856	
Tonnage waiting	14,710	2,200	

#### Pier and Bunker Prices, Gross Tons

PIERS		July 5 <sup>†</sup>	July 12 <sup>†</sup>
Pool 9, New York	\$4.60@5.00	\$4.60@5.00	
Pool 10, New York	4.50@4.75	4.50@4.75	
Pool 11, New York	4.25@4.50	4.25@4.50	
Pool 9, Philadelphia	4.70@5.00	4.70@5.00	
Pool 10, Philadelphia	4.45@4.70	4.45@4.70	
Pool 11, Philadelphia	4.30@4.50	4.30@4.50	
Pool 1, Hamp. Roads	4.30@4.35	4.25	
Pool 2, Hamp. Roads	4.15@4.20	4.10	
Pools 5-6-7, Hamp. Rds.	4.00@4.10	4.00	

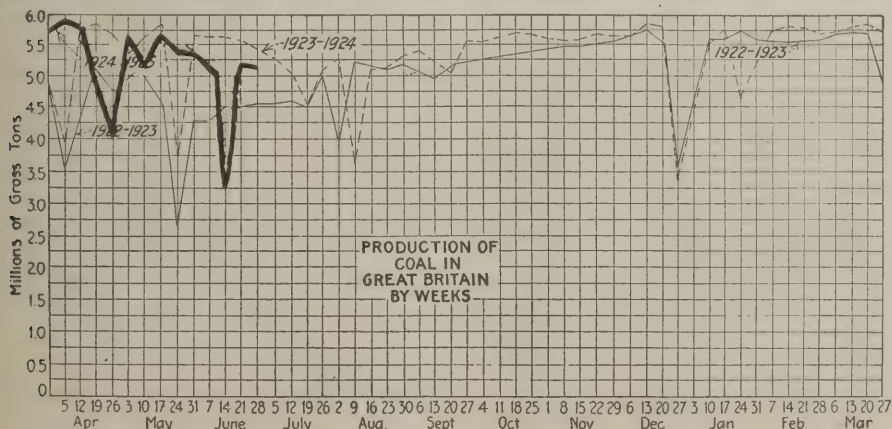
#### BUNKERS

Pool 9, New York	4.90@5.00	4.85@5.25
Pool 10, New York	4.80@5.05	4.75@5.00
Pool 11, New York	4.55@4.80	4.50@4.75
Pool 9, Philadelphia	5.00@5.30	5.00@5.30
Pool 10, Philadelphia	4.75@4.95	4.75@4.95
Pool 11, Philadelphia	4.50@4.70	4.50@4.70
Pool 1, Hamp. Roads	4.35	4.30
Pool 2, Hamp. Roads	4.20	4.15
Pools 5-6-7, Hamp. Rds.	4.10	4.00

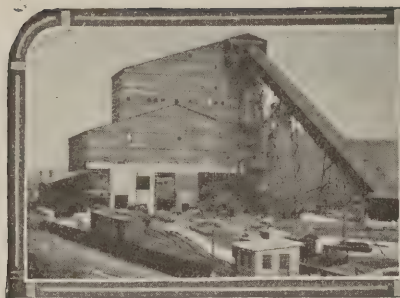
#### Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations by Cable to Coal Age		July 5	July 12 <sup>†</sup>
Admiralty, large	28s.6d.	28s.6d.	28s.
Steam smalls	18s.@18s.6d.		18s.
Newcastle:			
Best steams	19s.6d.@20s.	20s.	20s.
Best gas	23s.@23s.6d.	23s.	23s.6d.
Best bunkers	22s.	22s.	

<sup>†</sup> Advances over previous week shown in heavy type, declines in italics.







## News Items From Field and Trade



### ALASKA

The Geological Survey has begun its 26th successive year of the investigation of the mineral resources of Alaska. During this time it has mapped the topography and geology of over one-third of Alaska's total area of 586,400 square miles. It has investigated in at least a preliminary way every producing mining district in Alaska, and has mapped many of these in detail. Since 1905 it has annually collected and published the statistics of mineral production of the territory. The results of this work are published in 380 different reports and over 400 maps, which throw much light on the resources, including water supply, as well as the topography and geology of Alaska. A detailed topographic survey is being made of the Hyder district, of southeastern Alaska, by R. M. Wilson, topographic engineer. A. F. Buddington, geologist, is continuing his investigation of the geology and mineral resources of southeastern Alaska. This year he will investigate parts of the Ketchikan, Wrangell, and Juneau districts. S. R. Capps, assisted by Kenneth Landes, is making a supplementary examination of the Matanuska coal field.

### ARKANSAS

The Meard and Bevil mine near Bates is being pumped out and arrangements are now being made to operate it after a suspension of 10 months.

It is hard to believe that District No. 21 of the United Mine Workers, covering Arkansas, would violate a contract, but Webb Covington says it violated its two-year contract to employ him at \$7,500 a year as the district's chief attorney. So he is suing for a year's pay.

### CALIFORNIA

With the price of oil mounting, California is taking more interest in its coal. Lloyd L. Root, state mineralogist, recently issued a statement in which he said the California coal deposits were estimated at one billion tons and that a total of 5,177,125 tons has been extracted. He calls attention to the presence of iron ore in Shasta, Madera, Placer, Riverside, San Bernardino and Mendocino Counties and says: "The lack of cheap coke makes it impossible to use these ores commercially. There is a good future in the iron and steel industry in this state when coke can be obtained economically." He says there has recently been a little prospecting for coal in the Ione field of

Amador County; at Tesla, in Contra Costa County; at Stone Canyon, in Monterey County, and at Palo Cedro, in Shasta County, but that the only development of importance has been made this year in the 14-ft. seam of sub-bituminous coal at Dos Rios, Mendocino County.

### ILLINOIS

A strike of 100 miners at the Shuler Mining Co., of Alpha, has been settled and the men have returned to work. The mine will now be operated about three or four days a week.

Peabody Coal Co. mine at Marion recently broke its hoisting record with a total of 2,892 tons in one day, filling 59 railroad cars and requiring 1,394 dumps.

William Kortkamp, Sr., veteran coal operator of Montgomery County and widely known throughout that territory, was recently appointed county mine inspector by the County Board of Supervisors.

A mine may be sunk soon at Ashland, as a company of business men has been formed at that town to start the enterprise. Officers are F. C. Walbaum, president; H. J. Loman, secretary, and J. N. Blank, treasurer.

The Wittenborn & Carter Coal Co. has completed its tippie and is now handling three grades of coal. This mine is located on the Wittenborn farm, three miles south of Cutler, on the Duquoin and Chester state road.

It has been announced that the St. Louis Coke & Iron Co., now operating blast furnaces and eighty coke ovens at Granite City, will add another blast furnace to its plant at that place. This plant expansion will cost approximately \$2,500,000 and it is the intention of the company to turn the gas from the blast furnaces into electrical energy, which will be sold to public utility corporations in southern Illinois and Missouri. Southern Illinois coal is used exclusively in the plant at Granite City.

The Jefferson Southwestern Ry., built recently by the Illinois Coal Corporation to connect its new mining town of Nason with Mount Vernon, 11 miles distant, has not yet freed itself of operating limitations. It was built last year in the face of other railroad opposition. Although it obtained permission of the Illinois Public Service Commission to operate in intrastate traffic, it has been able to make joint traffic agreements only with the C. & E. I., the L. & N. and the Southern and it is still petitioning the Interstate

Commerce Commission for the right to participate in interstate traffic. This petition has been denied once, but on an appeal the commission decided to permit operation under certain specific restrictions. The railroad's second appeal to have these restrictions lifted has been in for about two months and another decision is expected.

An effort is being made to reorganize the Lovington Coal Mining Co., which is now in bankruptcy. The company has a mine and about 5,000 acres of coal rights at Lovington. It is stated that stockholders in the present company will realize very little from their claims.

### KANSAS

It is still possible, under the Kansas Industrial Court law, to jail a man for calling a strike in an essential industry just as Alexander Howat was jailed. The Kansas Supreme Court reached this decision July 5 after a rehearing of the case of August Dorchy, Howat's lieutenant, who was jailed with him two years ago. Howat has been pardoned but Dorchy took an appeal. The Kansas Supreme Court decided that even though the United States Supreme Court last fall declared the wage-fixing section of the Kansas law unconstitutional, the balance of it stands alone and remains in effect.

### KENTUCKY

A large commissary store operated by the Black Diamond Mining Co. at Drakesboro was one of several stores in the town to burn in a \$100,000 fire on the night of July 6. The company mines have been down for some weeks on account of the district strike.

Fred M. Sackett, prominent coal operator, retailer and jobber, of Louisville, has named the advisory committee to aid him in his race for the U. S. Senate on the Republican ticket. Denver B. Corbett, of Harlan, is one of several coal-mine operators included.

The Harlan Coal Co., Louisville, on July 7, lost a suit pending since 1920, following a five-day argument, in Judge Gordon's court, in a suit for \$75,000 damages against the Wheeler Coal Co., of eastern Kentucky, in which the Louisville company alleged violation of a contract. The petition was filed on Aug. 2, 1920.

The Hatfield-Reliance Coal Co., which succeeded the Reliance Coal & Coke Co. some weeks ago in a merger of the Reliance and Hatfield interests of Cincinnati, is reported to have been



enlarging its mining plant at Glomawr, four miles from Hazard. The company has completed sixty additional miners' homes and plans increased output through new mines already opened.

A petition for writ of error and right to appeal to the U. S. Circuit Court of Appeals of the Sixth District at Cincinnati was granted the Fordson Coal Co. in its suit against the Kentucky Coal Lands Co. and others, by Judge A. M. J. Cochran, in the U. S. District Court at Lexington, Ky., July 2. This followed Judge Cochran's denial of writ of possession and overruling motion for possession by the Fordson Coal Co. of the lands under litigation in Leslie County valued at \$100,000. In his judgment against the Fordson Coal Co. Judge Cochran ordered that the plaintiffs pay all court costs. In granting the appeal to W. K. Middleton, of Detroit, one of the lawyers in the case, Judge Cochran set the date for the Cincinnati filing for Sept. 1.

## NEW YORK

Mayor Schwab, of Buffalo, has recommended the putting of automatic coal burners into the furnaces at police headquarters and the various station houses about the city, at a cost of about \$10,000. Certain sample burners used by the city are said to have effected a big saving.

## OHIO

F. S. Davidson, formerly with the Gibraltar Coal & Coke Co., has taken service with the Columbus office of the Elk River Coal & Lumber Co. George A. Ramsey, formerly in the jobbing business in Columbus under the name of the George A. Ramsey Coal Co., also has joined the staff of the Elk River Coal & Coke Co., and will cover the State of Indiana.

A conference of the joint committee representing operators and miners in the Hocking Valley field was held at Logan, Ohio, last week, starting July 8. An entire new set of rules containing many radical changes from those formerly in force was presented for discussion. The matter was considered for the remainder of the week without arriving at any decision. It is believed that some conclusions may be reached which will mean the opening of a number of mines in the southern Ohio field.

Columbus coal operators were advised recently that more vessels are being offered at Toledo and Sandusky ports than are needed for the transportation of coal to the Northwest. Part of this excess tonnage of shipping is due to the fact that Ohio mines at the present time are producing very little lake coal, owing to a scarcity of orders. Heavy tonnage of lake coal continues to pass through Columbus from the non-union mines at West Virginia and Kentucky to the docks at Toledo and Sandusky.

## PENNSYLVANIA

Fire of unknown origin destroyed the tippie at the Pittsburgh Coal Co.'s Partridge mine, near Allegheny, early on July 4. The mine has been idle since last autumn.

W. J. Rainey, Inc., resumed operations early last week at the Allison No. 1 plant, which was one of the plants closed down the week before because the men refused to continue at work at the 1917 scale. The men returned to work at that scale, however.

The Gulf Co. coal mine at Marion Center, Indiana County, resumed operations during the last week in June as a non-union mine. The Gulf Co. some time ago proposed to its 150 miners that they accept a reduction of wages to the scale of 1917. The proposition was rejected and the men struck.

All arrangements have been completed for the transfer of the plant of the Worthington Pump & Machinery Corporation at Hazleton to the Pennsylvania Power & Light Co. The sale of the property became effective on July 1.

The Clearfield Bituminous Coal Corporation, Indiana, Pa., has abandoned the colliery located in the Clymer-Dixonville field on the Cherry Tree & Dixonville R.R. heretofore operated under the name of Sample Run Mine. It has been replaced by a new, modern, well equipped operation to be known as Clymer No. 1.

A severe rain and windstorm on June 25 caused damages estimated at \$300,000 in the Shenandoah district of the anthracite field. The roof of the Shenandoah City colliery of the Philadelphia & Reading Coal & Iron Corporation was torn off and machinery knocked out of alignment while the Plank Ridge washery was completely

demolished. At the North Mahanoy colliery the storm did damage estimated at \$40,000. A pipe line and the stacks from the boiler house were thrown through the engine house and into the machinery of the colliery.

It was reported on June 24 from Lotts Creek that Charles Lynch, mine superintendent for the Ajax Coal Co. and Superior No. 4 Co., was shot and killed by John Vermillion, merchant at Lotts Creek, the killer claiming self-defense. Lynch was formerly from Tennessee.

The Republic Iron & Steel Co. has closed down the only mine it had been working at Russelton, in the Freeport district, which means that the only active operations of the company are one mine at Bowood and one at Martin, which are doing pretty well. The Ford Collieries Co., at Curtisville in the Freeport district, has one out of three mines working.

It is reported that the Monessen Coal & Coke Co., a subsidiary of the Pittsburgh Steel Co., is negotiating for the purchase of the Lilly Coal & Coke Co., operating a large modern mine in the Pittsburgh vein of coal, near West Brownsville, Washington County, on the Monongahela River and the Pennsylvania R.R., with facilities for either river or rail shipments. Thomas Elliott, of Brownsville, is president of the Lilly Coal & Coke Co.

Charles O'Neil, secretary of the Central Pennsylvania Coal Producers' Association, returned to his office in Altoona after a two weeks' absence. Mr. O'Neil was a delegate from the Blair-Bedford Congressional district to the Democratic National Convention in New York.

All mines of the Consolidation Coal Co. in the vicinity of Meyersdale, Somerset County, were closed for a period of two weeks beginning July 7. This is the first shutdown of the mines since work was resumed in April after a long period of idleness. At that time the miners accepted a substantial reduction in wages. No reason was given for the shutdown.

Officials of the Lehigh Valley Coal Co. have decided to resume the first-aid contests held years ago but not so prominently featured during recent years. They have made reservations for Hazle Park, Hazleton, for July 21 and 22 for the events.

Figures for the first half of the present year for the central Pennsylvania bituminous district show that the loadings were 337,271 carloads, a loss of 114,154 carloads compared with the corresponding period of 1923. It was expected that production would gain in June, but figures compiled by the Central Pennsylvania Coal Producers' Association, Altoona, show a loss of 49 carloads from May, the figures being May, 49,533, and June, 49,464 car loads. These figures indicate about 45 per cent of the maximum production and about 60 per cent of the normal production of the district.

Heilwood won first place in the tenth annual inter-plant first-aid meet of the subsidiary companies of the Bethlehem Steel Corporation, held at Johnstown June 28. Heilwood had a percentage of



Monarch Tipple, Sheridan-Wyoming Coal Co.

Coal from this mine finds a market in Wyoming, Iowa, Nebraska, Montana, Washington and North and South Dakota.

Courtesy U. S. Distributing Corp.



95.2. The Preston division team from Masontown, W. Va., was second, with a percentage of 92.6. The Ellsworth division team was third with a percentage of 92.2; Marion division had fourth place with a percentage of 91.8; Johnstown was in fifth place with 91.6, and Wehrum was sixth with 90.

## UTAH

The United States Fuel Co., of Salt Lake City, has bought a herd of cows to furnish milk for the coal mining camp of Hiawatha. A modern barn and every facility for operating a successful dairy for the camp has been installed.

There is to be no increase in the rate for workmen's compensation in Utah, according to a decision just rendered by the Industrial Commission. The decision took into consideration the safety provisions adopted since the Castlegate catastrophe last March, it was stated. A formal statement was to the effect that the experience in Utah justifies continuance of the rate of \$3.90 per \$100 of payroll. Figures were compiled by the National Council on Compensation Insurance.

## WASHINGTON

Mel C. Butler, of Seattle, is beginning to develop six sections of coal land south of the Wilkeson mine and east of Carbonado. He says this work is for the new Pacific Coal & Coke Co., which is said to be ready to build a blast furnace near Enumclaw if the coal land pans out.

The annual first-aid and mine-rescue meet for western Washington is scheduled for Carbonado on Aug. 9. About 25 teams from Bellingham, Black Diamond, Burnet, Carbonado, Fairfax, New Castle and Wilkeson are entered. The committee in charge of affairs is headed by David C. Botting, of the Pacific Coal Co. His principal aides are A. G. Harvey and A. E. Holden.

Activity at the marine coal bunkers of the Pacific Coast Coal Co. the week before last exceeded anything of like nature there for many months. On Sunday morning the Norwegian freighter Balto berthed for coaling. Immediately following the Balto, the Holland-America steamer Moerdyk was bunkered. Both vessels took on large supplies, as both are bound for the United Kingdom and European ports. On Monday and Tuesday two large Nippon Yusen Kaisha passenger liners, the Mishima Maru and the Kaga Maru, called to load bunker coal for the return trip to Japan.

The Morton Coal & Coke Co. mine near Morton is producing again. It has been leased to Peter Pagolious and A. Flewelling, of Centralia. The mine output may be brought up to about 100 tons a day. Pagolious, a Greek, who is managing the property, has some ideas about "foreigners" in this country. He came from Greece 16 years ago and is an American citizen. He thinks all other aliens in the United States should decide, by the time they have been here five years, whether

they want to stay or return to their native land. If they want to stay they should become American citizens at once. He gathers his own men together in the mine every once in a while and preaches this doctrine.

## WEST VIRGINIA

The Raleigh-Wyoming Coal Co., of which Carl Scholz is vice-president and general manager, is sponsor for an interesting monthly paper, the *Edwight Eagle*, published with a view to establishing closer relationship and better understanding between the company and its employees.

There were 27 persons killed in the mines of West Virginia during May, according to a compilation by R. M. Lambie, chief of the State Department of Mines. Of that number, 11 were killed by falls of slate, roof and coal; seven by mine-car accidents; two in motor accidents, and three by electrical shock. Four deaths, occurring outside the mines, were the result of railroad car accidents and electrical shock.

The Fairmont-Chicago Coal Co. has begun to load coal over its new tippie at the Chesapeake mine, near Barrackville, in Marion County. The mine's capacity is 1,200 tons a day, but arrangements are being made to increase the tonnage by the beginning of the year to about 2,000 a day. The new tippie cost \$100,000, is of fireproof construction and is equipped with shaker screens, picking tables, loading booms, etc., it being possible to prepare seven different kinds of coal and to load three different sizes simultaneously. The tippie is operated through a system of electric push buttons, making it possible to stop the tippie machinery at any time from almost any point.

## WYOMING

Here is a new form of mine accident. Chester Tynski, mine worker, 18 years of age, was instantly killed at Winton, Sunday, June 29, while flying a kite. The young man was using some No. 17 enameled copper wire, taken off a Ford automobile generator, as a kite string, the kite and string falling across a 33,000 volt transmission line with fatal results to Tynski, although artificial respiration was used for an extended period in an effort to resuscitate him.

## CANADA

The mines of the Inverness Coal & Railway Co. at Inverness have been closed indefinitely, owing to demands of workers and market conditions. Efforts are being made to have the company reopen the mines on a part-time basis. These mines are the sole support of Inverness, an out of the way and isolated point on Cape Breton Island.

An explosion in the Allen shaft of the Acadia Coal Co., at Stellarton, N. S., on June 30, caused the death of four men and injuries to seven. These eleven men were entombed by a fall of coal in No. 3 level, about 1,200 ft. down. According to the statements of officials

of the company, there were seventy-four men in the mine when the explosion occurred, the other sixty-three making their escape. The damage to the mine was not as great as at first supposed. Company officials believe that operations will be resumed in three or four weeks.

## Obituary

According to word received in Fairmont, W. V., Dan R. Lawson, formerly secretary of the Northern West Virginia Coal Operators Association and district fuel representative of the United States Fuel Administration during the World War, died at the family residence in Philadelphia, following an attack of appendicitis. Mr. Lawson had resided in Fairmont for a number of years. He was connected at various times with the John Y. Hite and the C. D. Robinson coal interests, with the J. E. Long interests of Clarksburg, and with the Cortwright Coal Co. in Philadelphia. For many years Mr. Lawson was connected with a railroad in Chicago. A few years ago he helped organize the Appalachian Fuel Co., with headquarters at Fairmont.

C. M. O'Dell, chief engineer for the Dominion Coal Co., died at Sydney, N. S., on June 24 after a long illness, at the age of 63 years. He went to Glace Bay in 1886 in connection with the construction of the International Railway.

Wright Lawford, mining engineer for the Bottom Creek Coal & Coke Co., in the Pocahontas field, was instantly killed last week by a slate fall in the mine where he was at work. He was 25 years of age, having been born at Pocahontas, educated in the public schools of Pocahontas, at the Episcopal High School in Alexandria, Va., and received his engineering degree from the Alabama Polytechnic Institute at Auburn, Ala. For a time Mr. Lawford worked for the Pocahontas Fuel Co., becoming a mining engineer for the Bottom Creek Coal & Coke Co. about two years ago.

Herbert Bertrand Wright, long and prominently identified with the mining industry of southern West Virginia and southwestern Virginia died at his home in Pocahontas on Monday, June 30. Death followed an illness of about a year's duration. Mr. Wright was born on June 18, 1863, at Bury, Quebec. He received his education in the public schools of Quebec and at Eaton Academy, Eaton, Quebec. He later became a naturalized citizen of the United States. In 1893 he became superintendent of construction and operation of a mine belonging to the Elk Ridge Coal Coke Co. in McDowell County. From 1918 until the time of his death he was chief engineer in charge of all engineering work of the Pocahontas Fuel Co. He also was a vice-president of the Excelsior Coal Co. From 1896 to 1899, Mr. Wright was the manager of the Peerless Coal & Coke Co., at Vivian. In 1902 he became chief engineer in charge of surveys, prospecting, etc., on some 20,000 acres of coal lands for the Faraday Coal & Coke Co. His wife and one brother survive.



## Traffic News

### Want Northwest Rate Case Reopened

Application has been filed with the Interstate Commerce Commission by the Northern States Power Co., as a large user of all-rail fuel, for a rehearing in the case of the dock companies against the carriers for an adjustment of the discrimination alleged to exist in the freight rates from the docks and from the southern Illinois mines to the Twin Cities. The Minneapolis Traffic Association and the St. Paul Association also have intervened with a request to reduce the rate from the docks on soft coal, now \$1.82 for 150 miles, to \$1.50, rather than increase the all-rail rate, now \$3.47 for 630 miles, to \$3.75.

It is something of a question as to whether the commission will grant a rehearing after the recent complete consideration of the case, but it seems possible that there may be a resort to the courts by the all-rail shippers. That would hardly come until close to the time for the proposed change, August 21, when a temporary injunction might be asked, that would throw the case back until a court hearing. The carriers are proceeding with their arrangements for instituting the new rates.

### Hearing on Iowa Petitions for Lower Rates Completed

The long freight-rate hearing on various Iowa petitions for reduction of rates from many fields to Iowa have been completed. The sessions of the Interstate Commerce Commission examiner ran both in Des Moines and in St. Louis, Mo. A decision is expected by autumn.

### Alton Cuts Rate from Illinois To Kansas and Missouri

To enable Illinois operators to compete with Kansas coal operators for the Kansas City and St. Joseph (Mo.) trade, the Chicago & Alton R.R. is about to reduce the freight rate on fine coal from central Illinois 9c. a ton. The old rate was \$2.07 and the new rate is \$1.98. Some weeks ago the Southwestern district operators obtained a 9c. reduction from Kansas and Oklahoma. Immediately the Alton gave notice that it would voluntarily file notice of a reduced rate to take effect Aug. 7. This rate has now been published.

### Circuit Court Disallows Cut In Illinois Rates

The cut in coal rates between Springfield and Bloomington, Ill., ordered recently by the Illinois Commerce Commission was reversed by Judge E. S. Smith in Circuit Court at Springfield, July 2, and referred back to the commission for reconsideration and the taking of more evidence. The commis-

sion, upon the petition of the Bloomington Association of Commerce, reduced the rate from \$1.42 to 80c. A proportionate cut was made in the rate between Lincoln and Bloomington. The railroads objected to this as unreasonable and appealed to the Circuit Court.

## Association Activities

D. F. Buckingham, general manager of the Roslyn Fuel Co. and the Independent Coal & Coke Co., 818 White Bldg., Seattle, was elected president of the **Washington Coal Producers' Association** at its annual election held June 17. He succeeds E. P. Lucas, general manager of the Bellingham Mines, who has headed the association's activities for the past year. Prescott Oakes, treasurer of the Roslyn Fuel Co. and the Independent Coal & Coke Co., was re-elected as treasurer, and W. E. Maltby was again named manager of the association.

John C. Reid of the Cameron Coal Company, McAlester, Ok., was elected president of the **Southwest Interstate Coal Operators' Association** at the annual meeting of that organization. Approximately seventy-five members of the association from Missouri, Arkansas, Kansas and Oklahoma attended the meeting. Business of a routine nature, affecting the coal industry in the Southwestern field, occupied the attention of the members present for the one-day convention, according to W. L. A. Johnson, general commissioner of the organization, who was re-elected.

Practically all of the coal operators of Colorado and New Mexico met June 18 at Denver in the sixth annual meeting of the **Colorado-New Mexico Coal Operators' Association**, reviewing the year's work and taking a look ahead. The association re-elected F. O. Sandstrom secretary-treasurer and traffic manager. The officers for the ensuing year, in addition to Mr. Sandstrom, are these: President, F. R. Wood, president of the Temple Fuel Co.; vice-president, H. F. Nash, vice-president of the Oakdale Coal Co.; directors, W. D. Brennan, of the Phelps-Dodge Corporation; Frank Bulkley, of the Baldwin Fuel Co.; L. A. Hayden, of the Hayden Bros. Coal Corp.; W. H. Huff, of the Victor-American Fuel Co.; A. M. McNeil, of the McNeil Coal Co.; S. S. Murphy, of the Huerfano Coal Co.; H. F. Nash, of the Oakdale Coal Co.; J. J. Roche, of the Rocky Mountain Fuel Co.; J. van Houten, of the St. Louis, Rocky Mountain & Pacific Co.; J. F. Welborn, of the Colorado Fuel & Iron Co., and F. R. Wood, of the Temple Fuel Co.

## Coming Meetings

**First International Management Congress**, Prague, Czechoslovakia, July 21-24.

**Western Canada Fuel Association**, Convention Aug. 5 and 6, 1924, Brandon, Manitoba, Can. Secretary, W. H. Morrison, Winnipeg, Man., Can.

**Rocky Mountain Coal Mining Institute**, Summer meeting, Aug. 7-9, Rock Springs, Wyo. Secretary, Benedict Shubart, 521 Boston Bldg., Denver, Colo.

**New York State Coal Merchants Association, Inc.**, 14th annual convention, Sept. 4-6, Stamford-in-the-Catskills, N. Y.; headquarters Churchill Hall. Executive secretary, G. W. F. Woodside, Arkay Building, Albany, N. Y.

**Oklahoma Coal Operators' Association**, Annual meeting Sept. 11, 1924, McAlester, Okla. Secretary, A. C. Casey, McAlester, Okla.

**Association of Iron and Steel Electrical Engineers**, Annual meeting and exposition at Duquesne Garden, Pittsburgh, Pa., Sept. 15-20. Secretary, John F. Kelly, 1007 Empire Bldg., Pittsburgh, Pa.

**National Safety Council**, Thirteenth annual safety congress Sept. 29 to Oct. 3, Louisville, Ky. Managing director and secretary, W. H. Cameron, 168 No. Michigan Ave., Chicago, Ill.

**American Institute of Mining and Metallurgical Engineers**, Fall meeting, Birmingham, Ala., Oct. 13-15. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

**American Institute of Electrical Engineers**, Fall convention, Pasadena, Calif., Oct. 13-17. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

## New Equipment

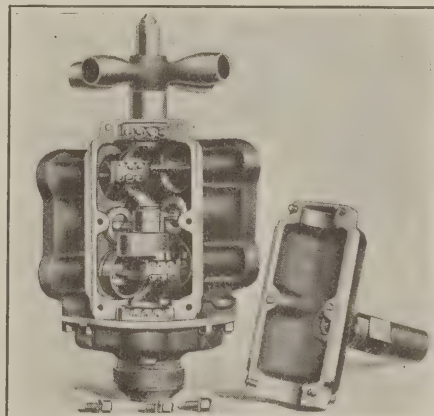
### Ball Bearings a Feature of Pneumatic Grinder

A pneumatic motor for operating portable drilling and other tools and designed to meet exacting requirements, and a new portable pneumatic grinding machine have been placed on the market by the Cleveland Pneumatic Tool Co., Cleveland. The outstanding feature of both the motor and the grinding machine is that both are provided with ball bearings.

The pneumatic motor is made in plain and compound-gear types. It is a four-cylinder unit having four single-acting pistons connected to opposite wrists of a double-throw crank. These wrists are grooved, hardened and ground, forming an inner ball race. The four connecting rods are enlarged at their end into a ring of sufficient size to be hung on to the end of the crank. The inside of the ring is machined to form the outer ball race. After the connecting rods are placed in position on the crank the balls are inserted and are retained in position by a spring ring retainer.

The pistons are screwed to the piston sockets, which in turn are attached to the connecting rods by a floating wrist pin which has oil holes for lubrication. The main valves are of the solid piston type and are operated from eccentrics on the crankshaft. They are placed between each set of cylinders from which they are separated only by a thin wall in which air ports are provided. The live air is, therefore, injected almost instantly into the piston chamber, assuring, it is claimed, quick motor action and conserving air. It is stated that on account of the reduction in friction through the use of ball bearings and the added power gained through quick delivery of the air to the pistons a very high motor speed and high drilling capacity is obtained.

The bearings on the crank and connecting rods, as well as the rods and pistons, run in the lubricant and the



**Compact Pneumatic Motor**

Equipped with four single-acting pistons and ball bearings this little air motor is claimed to be highly efficient and easy to maintain.



gears are similarly lubricated. The gear chambers open directly into the crank case, which is filled with an oil and is so constructed that the lubricant is not driven out when the motor is in action.

The portable pneumatic grinding machine has an arbor or extension covered by a housing which is used as a forward handle. The arbor is connected directly to the crank as shown in the illustration, and is mounted on annular ball bearings at both ends, as is also the driving crank. The single-piece connecting rods contain ball races, which operate directly on the crank. These races as well as the annular ball bearings on the crank and arbor bearings have continuous lubrication both in the crank chamber and in the forward quill housing. All the revolving parts run in lubricant.

The body is split at the center, which permits the removal of the crank assembly without disconnecting the pistons or valves from the crank. The piston cups are screwed to the piston sockets and reinforced by a lock nut at the base of each cup. The connect-



**Portable Grinding Machine**

A shield protecting the emery wheel makes it safe to operate this machine in close quarters. The lubricating system is arranged to supply oil to all wearing parts regardless of the position in which the outfit may be turned.

ing rods are attached to the piston sockets by a floating wrist pin, which is perforated for lubrication. Four types of throttle handles are available, these being the inclosed type with outside or inside throttle levers, a straight handle with snap throttle lever and a straight handle with twist throttle sleeve. The machine is made in two sizes, one weighing 12 lb. having a 6-in. emery wheel and a speed of 4,600 r.p.m., and the other weighing 21 lb. having an 8- or 10-in. emery wheel and a speed of 3,600 r.p.m.

## Portable Coal Loader

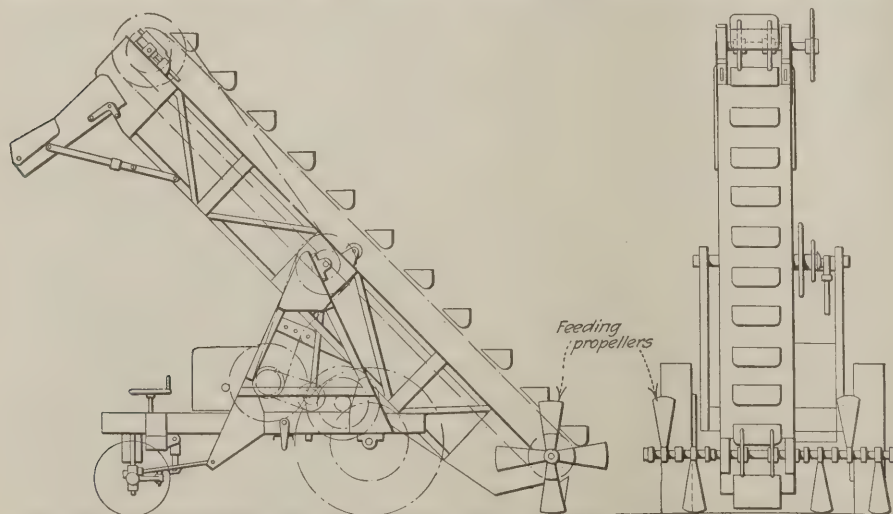
With its positive, self-feeding device the new path-digging loader recently announced by the George Haiss Manufacturing Co. will load any kind of anthracite or bituminous coal, from lumpy run-of-mine to buckwheat. The feeding propellers do all the work, and the only labor required is that of the one operator. There is no shoveling. The machine is provided with a slow-speed crowding gear which can be brought into play simultaneously with the combined loading action of the buckets and self-feeding device. This keeps the machine fed up against the pile in its most efficient working position, and, with the revolving propellers, digs a path right into the pile.

The self-feeding propellers are twelve slanting vanes, extending to each end of the shaft at the bottom end of the elevator. These rotate slowly under power and move coal gently and automatically from the out-

side one of the series, successively to the inner one, which delivers it in front of the loader. The buckets are heaped full continuously and discharge a full load into the truck.

The propelling mechanism is connected from the driving unit by a chain to a countershaft, then through a clutch to a jack-shaft, and thence to the two rear traction wheels by means of pinions and gears. The main gear shifter controls one forward and one reverse motion of the loader. The loader travels backward 60 ft. and forward 100 ft. per minute. A second, or very slow-speed gear-shifter engages a worm drive which propels the entire machine backward at a speed of only 30 in. per minute, while the feeding propellers convey the material to the buckets.

The wheels have a 10-in. face, and the driving pair are furnished with traction cleats. Heavy steel-plate propeller blades are bolted on to extra large cast-steel lugs which in turn fit rigidly on the big steel propeller shaft.



**Power-Driven Self-Feeding Coal Loader**

Propeller blades on the sides of the elevator buckets dig into the pile and pass the coal from the sides to the middle where the buckets are filled. A slow-speed crowding gear simultaneously keeps the loader well up against the pile so that the buckets are always full.

The revolving speed of the feeding propeller and the pitch and number of the blades, conform with the speed and the capacity of the elevator buckets. The spread of the feeding propellers across the back of the loader is more than the over-all width of the loader.

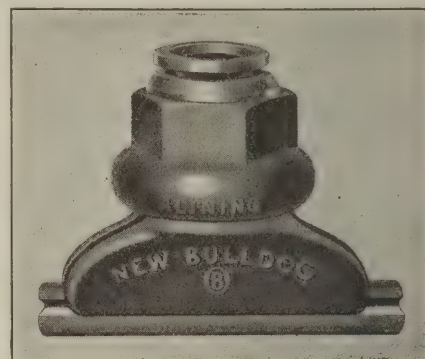
The construction is all-steel. The elevator truss frame is pivoted at the center and can be collapsed when moving the machine under overhead obstructions. The front wheels are 24 x 10 in. and have roller bearings. All other turning parts have bronze bushings. The machine bearings are provided with grease cups and the motor bearings have oil reservoirs.

The front axle is similar in design to that on an auto truck. The axle does not turn when steering the machine, but instead the two front wheels are steered by a handwheel through a worm and sector device and steering knuckles.

## Hand-Fastened Trolley Clamp With Aligning Feature

A new aligning clamp so constructed that it may be installed without any strain on the insulation of the hanger is just announced by The Ohio Brass Co.

This clamp is practically identical in appearance and construction to the



**Aligning Type Trolley Clamp**

This device may be aligned on the hanger without being loose on the stud or disturbing the insulation. Little labor is required to install the clamp and suspend the trolley wire.

Bulldog clamp except that it has the aligning feature. It has the same self-opening jaws that are controlled by the nut both when being opened and closed.

The new clamp, like the ordinary clamp of the Ohio Brass Co. without the aligning feature, is tightened onto the hanger stud by gripping the jaws with the hand. This is unlike usual types which cannot be tightened onto the hanger stud without applying a wrench to the nut. This difference is due to the fact that the jaws are loose on the boss for only slightly over one-half turn instead of being altogether loose. One-half a turn is sufficient to back off the jaws to align with the trolley wire after the clamp is tight on the hanger stud.

Tightening of the jaws on the wire with the nut does not affect the hold on the hanger as the nut itself does not touch the hanger insulation. There is no pressure against the insulation nor any grinding or wedging action.



# COAL AGE

McGraw-Hill Company, Inc.  
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Devoted to the Operating, Technical and Business  
Problems of the Coal-Mining Industry

R. Dawson Hall  
*Engineering Editor*

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Number 4

## Now It Can Be Told

THE WAY may be clear for coal trade statistical reports once more. At least it appears to be. Harlan Stone, United States attorney general, has shown no desire to upset the business advancement plans of the Department of Commerce as Harry M. Daugherty did before that gentleman was oiled out of the cabinet. And since the best information on the subject leads the Hardwood Manufacturers' Institute to believe that Mr. Stone is going to take the same sound position that Secretary Hoover of the Department of Commerce takes in encouraging trade statistics, it is preparing to resume the issuance of sales and stock reports. So the way appears equally open for the exchange and publication of data on closed transactions in coal.

With the coal market in its present deflated condition it is hard for some coal men to see what good it will do them to receive such data. There is so little trading in coal that everybody knows all about it without statistical reports—so they say. Nowadays the sale of one hundred tons of mine run creates almost as much furore among coal salesmen as a circus parade does in a townful of “kids.” But even in such a condition, the coal market would be more stabilized and less ruled by rumor if every legitimate trader in it knew positively what every other legitimate trader did the day before. And times are bound to change. People simply must begin buying coal before long. When they do the need for straight statistics on coal markets will be keener. The time for coal trade associations to get back on their feet and organize for service is now.

## Another Crime Averted

SOME of the gas journals, says G. S. Brewer in his report to the City of Buffalo on its fuel problem, want gas made at the mines. Later he proceeds to declare that the pipe should have a capacity one and two-thirds times as large as the average needs, so as to take care of the peak load.

We who have learned that our industry should be so regulated that it would have no excess capacity but always be just what the need demands or that we should regulate demand so that it would always fit capacity are surprised at this suggestion. Has Mr. Brewer no imagination or sense of leadership that he cannot find a way short of providing a pipe of excess capacity? Could not gas of a higher thermal equivalent be made in the winter? Could not the pressure of the gas pumps be increased when the cold winds blow? Could not the pipe be made to expand when the demand was greater? Could we not attempt even a revision of Boyle's law? Anything but an excess capacity!

But then if the gas were made of a high thermal value, the gas pressure were increased, the pipe ex-

panded, or Boyle's law were conveniently modified, why not use these magic powers all the year round? A smaller investment would then suffice, but there would still be that excess capacity. How prodigal! It is well the crime was averted, that G. S. Brewer nailed the sinful waste within the four narrow walls of his conclusions so tight that no one can hear its groanings, for had he not done so the coal industry, hoary with crime already, would have sinned again. No more excess capacities! An excess capacity in mines and men is enough; no excess capacity in pipes, in gas, in gas pumps should be added to the many offenses of the coal industry.

## Illinois Gets a Loader Scale

MACHINE loading of coal underground is free to go forward in Illinois at last. The scale for operators of loading machines which has just been signed by the Chicago, Wilmington & Franklin Coal Co. and its employees is not state-wide but it might as well be. It is the die in which all future wage agreements for machine operation probably will be cast, as company after company installs loading machines. The most agreeable thing about it is that it puts machine loading on a per diem instead of a tonnage basis—and that in the citadel of unionism, Illinois!

There is no controverting the fact that the coal-loading machine logically should be operated at present by men paid a flat daily wage. The volume of work a certain type of machine will do in eight hours under given mine conditions largely is determined in advance. If the operators do not bring it up to that capacity, they are not giving the machine or its owners a square deal. They certainly cannot push it beyond its limit no matter what their skill or willingness. Therefore, machine loading is not piece work in the nature of it and we are glad the Chicago, Wilmington & Franklin Coal Co. has established this wholesome fact in its agreement. Such an agreement couldn't have been written with John Lewis' union a month earlier than this one was.

The job that now confronts that coal company and every other company that adopts machine loading in Illinois is the ever-present job of getting a full day's work out of men paid on that basis. It is reasonable that intelligent and industrious Illinois machine loader runners receive \$10.07 for a full day of eight hours with a loader such as those on the market now. But that is a big day's wage, judged by any sound standard of manual labor. It now remains to be seen whether such a wage will attract, as has been frequently predicted, a class of high grade, square-shooting miners who will realize this fact. If it does, then the cost of producing coal in machine loading mines will be sufficiently reduced so that those mines will get business and the miners in them will get work.



## Are More Miners Needed?

DESPITE public clamor the cry still persists that coal loaders are scarce. A few years ago this cry was somewhat general. It has been only stilled, and that partly, by declarations from high authorities that there were altogether too many men for the tonnage the country could absorb and that this was true even at times when the demand for coal was greater than could be supplied from the coal fields owing to lack of transportation facilities.

No one can deny that this is true, yet the need for more men is still one of the perplexities that trouble operating officials. The reason for the paradox is the excessive number of mines in the coal fields. Almost every operator could find places for more men, and nearly every mine owner knows that if he had a larger force he could produce cheaper coal. So the hunt for men continues. Whether this is advantageous to the country as a whole is questionable, but it is natural for every owner of a coal mine to seek to hire as many men as will make operation profitable.

Certain parts of the country are more clamorous than others. The anthracite region is one of these. The law in that region requiring that every miner must have served for two years as a laborer under another miner has unduly restricted the supply of men. As anthracite is greatly needed the demand of that region is accepted as reasonable and as a problem in which the consuming public shares.

Another region is West Virginia. At first it met its demand by drawing on the farming population, which readily left its unprofitable farms on the steep hill-sides for a more profitable occupation in the mines. But West Virginia was sparsely settled. Much of it was unfitted for the plow, and the market being remote, the population had not been supplemented by immigration. In consequence of the lack of native labor, West Virginia made a heavy bid for alien immigration to support its growing production, alleging, however, that the Department of Labor favored union regions and directed the new arrivals away from non-union fields.

Consequently West Virginia has felt the lack of labor more perhaps than any other coal-producing region. Its call for labor has always been insistent. Its lack of miners has kept it from the development that its nearness to the sea coast, its low freight rates, its excellent coal, the spread of its coal fields and its lower daily wage rates otherwise would have afforded it. Some of the other coal areas have not been greatly sympathetic with this lack of labor, but it naturally has been a thorn in the flesh of West Virginians who are interested in the progress of the state.

Now the state has been further hit by the restriction of immigration, which possibly bears more heavily on mining than on other industries. Progress in West Virginia is retarded. The public, however, is so strongly convinced that there are too many miners that it will be a long time in doubt whether ameliorative action should be applied.

Those who wish to see the miners kept steadily working will not be sorry to learn that forces are at work to reduce the mining population. The miners also will rejoice. It may be only a few years before the operation of conditions such as are described in an article appearing in this issue and entitled "Coal Loaders—How Are We Going to Get Them?" may bring the number of miners down to such a level that their output

—greatly augmented by machinery—will be sufficient only when working steadily to supply the market. Then may come a condition the converse of that now existing. Meantime and thereafter West Virginia will suffer and coal-loading machines and conveyors will have a day of rapid extension.

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## Watching the Parade

THOUGH coal never leads the country's industrial parade, it never gets left around the corner, either. It always keeps up in the long run with the rest of the procession. Therefore, when the coal industry marks time it does the coal man good to get up on an eminence somewhere and view the rest of the parade—that is, if the result of his observation proves to him that the other paraders are still moving onward with unfaltering step. He knows it will be only a short time till his own contingent is ordered forward on the "double quick." The glance he will make just now will fill him with encouragement. He can hardly pick a better place to look than at the statistics charting the course of revenue freight cars loaded with all commodities, remembering that the country ships goods only when it is busy.

These charts now show that during the first half of 1924 the railroads loaded more revenue freight than during the first half of any year since 1919 excepting last year, and that 1923 was only eight per cent ahead of 1924. The total revenue freight loaded thus far in 1924 is a trifle of twenty-three million cars, which constitutes a briskly moving procession no matter by what standard it may be measured. Naturally the two-weeks period over the Fourth of July shows a drop, as ever, but the rebound also occurs, as usual, and loadings are now on their way upward toward the inevitable fall peak. This 1924 is well on its way toward the fifty-million mark which 1923 established in revenue car loadings.

There is something wholesome about this industrial parade of freight cars up and down and back and forth across the United States. It indicates that the country's huge stock of coal is swiftly going down. In spite of the fact that coal loadings, which normally represent a third of the country's freight movement, are about 40,000 cars a week under 1923, the carriers are otherwise busy and there is no denying it. There is no confusion about their activity, however, for never in the recent history of railroads have they been in such good shape mechanically and in personnel. But they are handling a vast volume of freight. And coal loadings are moving up at about 3,000 cars a week.

The main question of interest to the coal man, as he takes this glimpse at the freight parade is: How fast will this acceleration of coal loadings proceed? When will they be up to "normal"? It is true that iron and steel production is low and has been dropping since March. It is true that production in some other lines, notably automobiles, continues low. But it also is true that average consumption of commodities generally has taken its upward turn and is now ahead of output. This naturally will soon cause a turn in production.

So, in spite of this being presidential year, there is little inflation and general economic conditions are sound. A steady upward trend in coal consumption is already starting. The country's industrial parade is headed in the right direction.



# Suggestions for Concentrated Machine Mining

Coal Is Produced by Manual Labor, Every Other Commodity by Machine—Mines Laid Out to Suit Hand Methods Not Adopted to Machine Loading—Conveyors Greatly Simplify Machine Operation

BY N. D. LEVIN  
Columbus, Ohio

WE LIVE in an age of machinery; almost everything by which we satisfy our daily needs is produced by mechanical means. The soil is tilled, the crops harvested and the production of food of every description in sufficient quantity and proper quality is today possible only through the aid of machines. The houses we live in, the furniture with which they are provided, our transportation systems, our telephones, in short practically everything needed, used or consumed by the human race, with one great exception, is produced by machinery. This solitary exception is coal. In many localities this fuel is still mined with pick and shovel and almost the entire output of the country is loaded underground by hand.

Many people have realized this situation and have sought to produce machinery for loading coal in the mine. During the last twenty years many hundreds of patents have been taken out, and millions of dollars have been spent on the development of coal-loading machines. And yet nearly all of the coal produced is loaded by hand. The reason for this is not in the obstacles encountered in developing loading machines, but in the difficulty met with in adapting machines already perfected to mining systems that were developed when nothing more mechanical was available for the purpose of coal production than pick and shovel.

With hand loading, the output from each working place is limited; consequently a great number of working places are needed in each mine in order to obtain the desired output. It is evident that it is not practicable to use machines if they must go into several hundred places in order to obtain the necessary production. There are too many delays of various descriptions

in attempting to load mechanically in such mines, and it is these delays that are responsible for the economic failure of coal loading by machinery.

It is necessary therefore, to change the mining system so that machines can be kept going a full shift in the same working place. Means also must be provided for removing the coal without interruption.

## LOCAL CONDITIONS FIX PLAN TO BE ADOPTED

The object of this article is to suggest certain principles that should be kept in mind in laying out a mine or a part of a mine for mechanical loading. Each locality will have its own problems to solve. It is hoped that the accompanying diagrams may help to suggest some scheme that can be worked out successfully.

Fig. 1 shows the V-system that is being used by the West Virginia Coal & Coke Co. This system of mining was fully described in *Coal Age* (issue of Feb. 7, 1924, p. 197) and needs no further comment here.

Fig. 2 shows a modification of the V-system. Conveyor-loaders are used on the working faces delivering coal into sectional conveyors, which in turn deliver it to a main conveyor. The narrow work is performed by entry-driving machines and sectional conveyors. One loading point serves the entire system.

Fig. 3 shows a system embodying several faces indicated by numbers 2, 3, 4, 5, and 6. These faces may vary in length from 75 to 200 ft. or more, depending upon local conditions. A loading machine and a conveyor, or a combination conveyor-loader serves each face. The coal from face No. 2 is delivered to a conveyor on entry No. 2. That from face No. 3 is delivered to a conveyor on entry No. 3 and so on. These

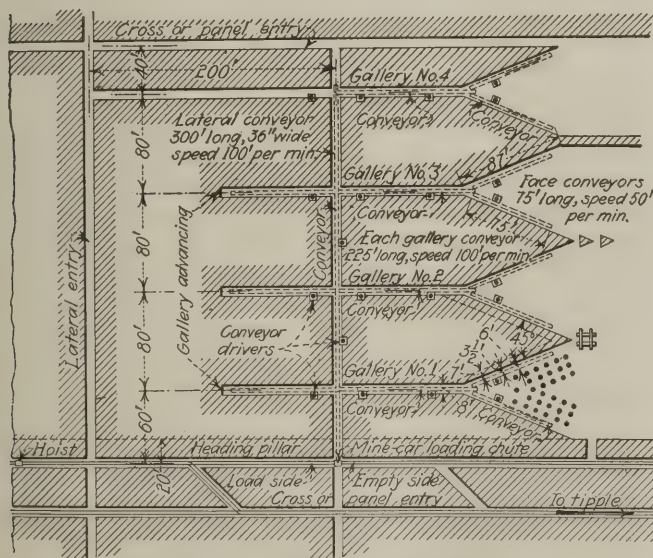


Fig. 1—V-System of Mining

By the arrangement shown each pillar furnishes two faces, each of a length approximately equal to the width of the pillar. A large tonnage is thus secured from a comparatively small area, supervision is concentrated and the advance is rapid.

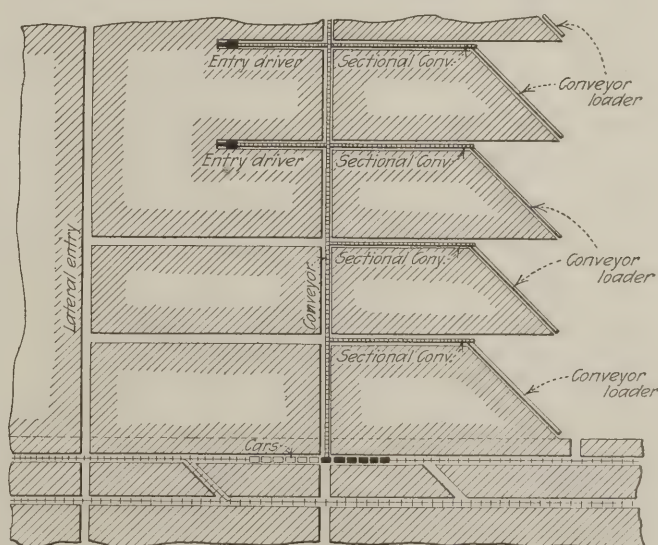


Fig. 2—V-System of Mining Modified

In the mining system depicted the pillars are worked on long slanting faces. All mining is done by machine and both development and main extraction are performed rapidly. Again, supervision is concentrated and efficient.



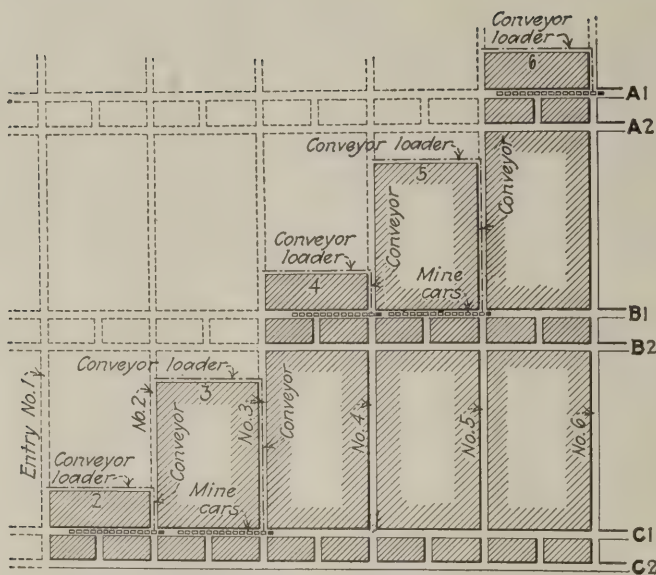


Fig. 3—Panel System, Worked by Conveyor

Five trips of cars are shown loading on three entries at the same time. The faces, which are made of a length to suit conditions, are arranged in echelon so that the line of roof break presents a saw-toothed appearance.

conveyors are made in sections so that they may be shortened as the face is brought back. The coal from faces 2 and 3 is loaded onto cars on entry *C1*, and that from faces 4 and 5 is loaded on entry *B1*. In order to obviate interference between the two loading points on each entry, as they are rather close together for handling long trips, and in order to keep an uninterrupted car supply at each loading point, a certain amount of switching will be necessary between entries *B1* and *B2*, also entries *C1* and *C2*.

It is believed that it would be economical and preferable to provide an additional conveyor for each pair of face entries, as shown in Fig. 4. In this case, the sectional conveyors on entries 2 and 3 deliver coal into a conveyor on entry *C1*, which loads cars on entry No. 4. This arrangement is duplicated throughout the mine. The empty trip may be brought in on entry *C1*, switched through entries Nos. 5 and *B2*, and then to the loading station in entry No. 4, the cars being all loaded at the intersection of entries Nos. 4 and *C1*. This will do away with a gathering locomotive, and one

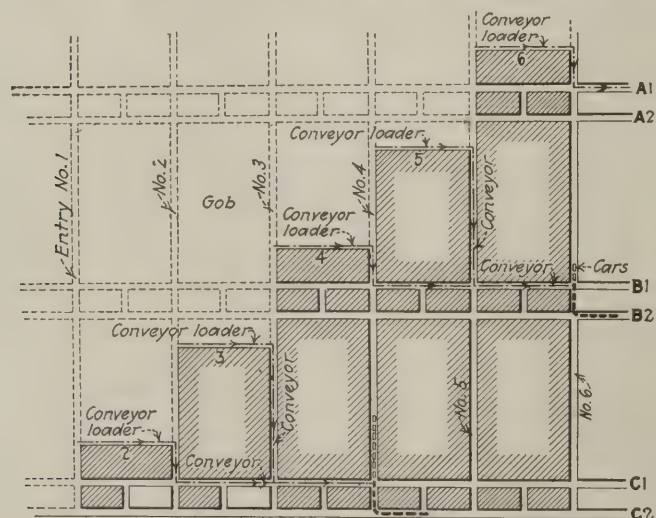


Fig. 4—Another Conveyor System of Mining

The mine layout is practically the same as in Fig. 3 but more conveyors are used so that coal from two faces instead of one feeds to each loading point. Fewer but perhaps heavier locomotives will accordingly be required.

loading point will serve for two faces. A small rope hoist should be provided near the loading point, so that one man can feed the trip past the discharge end of the conveyor, which is not stopped when shifting cars.

Fig. 5 shows a mining system worked out by the New River Co., MacDonald, W. Va. In this plan a combination conveyor-loader serves face No. 1, and another face No. 2, one machine carrying the coal in a left-handed and the other in a right-handed direction. A sectional conveyor is provided on an entry which divides the face into two parts. Each face will be about 80 ft. long; that is, faces 1 and 2 together will be about 160 ft. in length. One object in driving the extra entry in the middle of the face is to provide a safe retreat for the men in case such a retreat is needed.

Fig. 6 shows the adaptation of a room-and-pillar system to loading machines. Butt entries are shown 600 ft. apart; narrow rooms are driven clear through between these entries. The rooms may be driven 12 or 14 ft. in width by entry-driving machines. The coal is taken away from these machines by means of sectional conveyors that are lengthened as the entry drivers advance. After the rooms are driven through, slabbing cuts are made with either longwall or short-wall machines; the coal is shot down and loaded out by mechanical loaders suited to longwall work, or by combination conveyor-loaders.

If the distance between the entries is 600 ft., each conveyor-loader would serve about a 300-ft. face. The coal is carried to butt entries at each end of the room; that is, carried right and left along the face. On each butt entry is a conveyor that takes the coal away from both the slabbing machines and the entry drivers. Two slabbing machines are shown in this figure as well as two entry-driving machines discharging into a common conveyor, which in turn loads a trip of cars from the side by means of a chute. This loading point will remain at the same place for a considerable time; consequently in many cases it would be entirely practical to take down sufficient top at this point so that the conveyor can be elevated high enough for a chute to be used for loading.

Fig. 7 shows a three-entry system. This may be used where the roof is of such a character that it will not permit of slabbing the rooms entirely out to the entry. In such a case, the crosscuts in the pillar between the middle entry and the room entry act as room necks.

In this layout one conveyor takes the coal from one slabbing and two entry-driving machines. A short conveyor is provided through one of the crosscuts, and the trip of cars is loaded on the center entry.

Fig. 8 is the same as Fig. 7 except that a possible way of drawing pillars is indicated. Under some roof conditions it may be possible to use light portable conveyors to take the coal from the pillar to the slabbing-machine conveyor.

#### MODIFIED ROOM-AND-PILLAR SUITED TO MACHINES

It appears that in practically any mine, the present room-and-pillar system may be modified to suit mechanical loading along some such lines as those suggested. The top can be handled exactly as it is in the present system, and as rooms can be worked out in an exceedingly short time, it is believed that, with the same degree of safety, they could be driven much wider than under present mining methods.

To the left in Fig. 9 are shown two cross-sections of



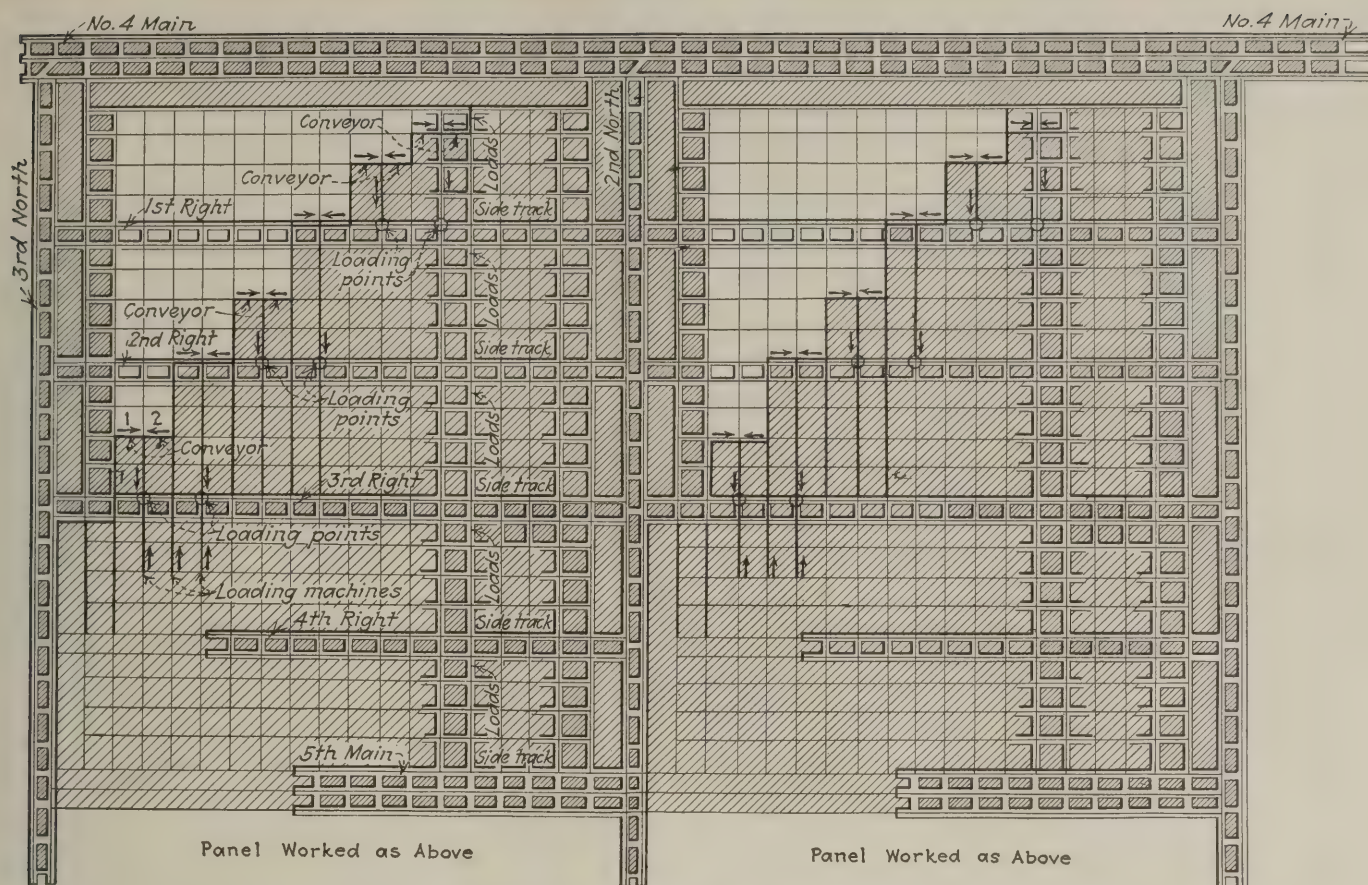


Fig. 5—How the New River Co., of West Virginia Operates the Panel system

Here again two faces are tributary to each loading point. The breakline, as before, is saw-toothed. The rapid advance of the faces obviates the excessive use of timber.

a long face such as those worked in Fig. 4. The upper cross-section shows a longwall machine making the undercut. Behind it is a combination conveyor and loading machine which reaches the entire length of the face. The space between the face and the first row of posts is 6 ft. in width. This gives ample room for both the machine and the conveyor-loader. It is possible to reduce this distance to 5 ft. in case of necessity, but 6 ft. is preferable. The lower left-hand figure shows the coal shot down.

This figure indicates a 7-ft. bed and in such a case, after shooting, the space between posts and face would

be pretty well filled up with coal; consequently the conveyor-loader is covered, before the shots are fired, with short pieces of board which are removed afterward one at a time, beginning at the discharge end, the coal being carried away as the boards are withdrawn. The machine is then fed forward into the pile.

The two sections to the right in this figure show the same arrangement in a thin coal bed. As soon as the coal is loaded out at one end of the face, the setting of a new row of posts can be begun, as the conveyor-loader is flexible and is not moved up into the coal pile bodily, but with the tail end first. The rest of the conveyor is then gradually moved over so that by the

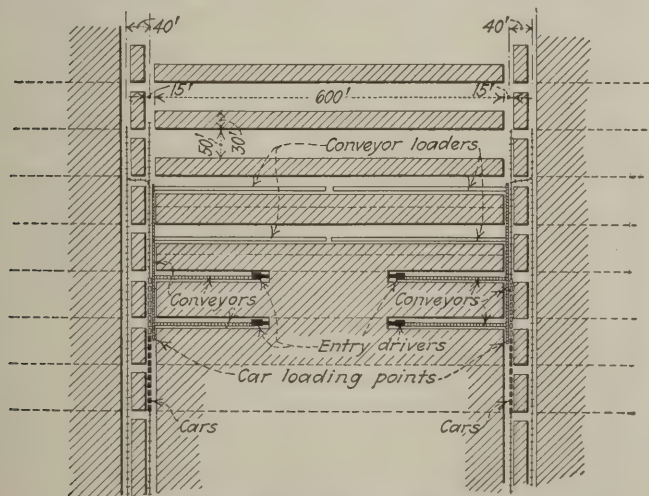


Fig. 6—Room and Pillar Worked by Conveyor

Both entry drivers and conveyor-loaders feed to heading conveyors. Slabbing cuts along the 600-ft. ribs furnish a large tonnage. Some coal, however, is lost in the pillars that cannot be entirely drawn.

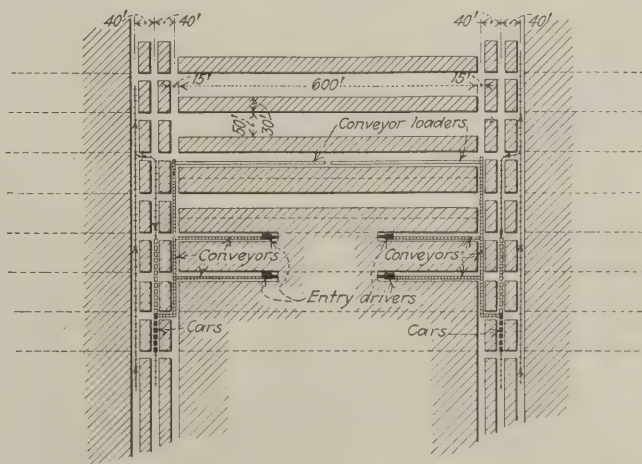


Fig. 7—Room and Pillar for Weak Roof

This is a modification of the system shown in Fig. 6, being better suited to a cover that breaks easily. By this plan cars are always protected by the pillars upon either side of the loading entry.



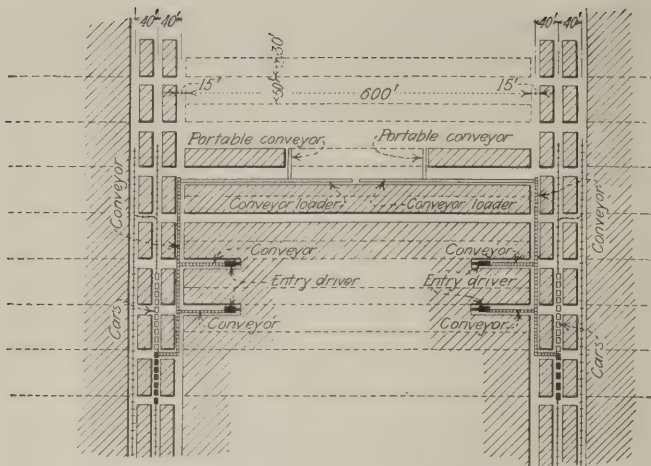


Fig. 8—Drawing the Pillars of Fig. 7

If the nature of the roof is such as to permit the removal of the room pillars, this may be done by means of short conveyors feeding to the conveyor-loaders. Although only two cross-conveyors are shown it is probable that in some cases more could be used to advantage.

time the coal is all loaded out, another row of posts 6 ft. away from the new face has been put in place. The arrangement of mining indicated in Fig. 9 is recommended for any thickness of coal where the roof is bad. The conveyor-loader is only 17 in. high, and the long-wall machine is of about equal height.

Adequate ventilation in mechanically-operated mines is somewhat difficult to provide because of the lack of uniformity in state laws. At the time these various statutes were enacted they were necessary and beneficial, but as the art of mining coal advances, the laws must be altered to take cognizance of modern methods and changed conditions. It would be absurd to compel a railway company in building a tunnel through a hill, to drive two passages with cross tunnels between them, in order to convey air to the men who are working at

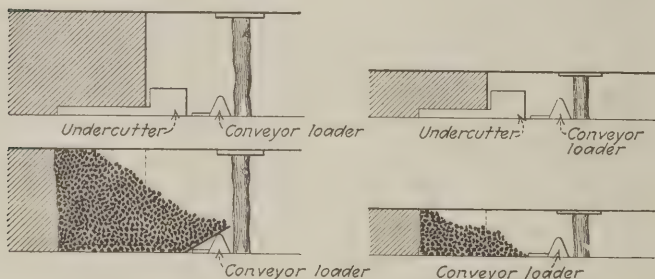


Fig. 9—Cross-Sections of Thick and Thin Beds

Thick beds naturally produce more coal than thin ones. In a thick bed as shown at the left it may be necessary to protect the conveyor-loader when shooting the face. The removal of the protecting boards allows much of the coal to roll onto the conveyor-loader by which it is removed. The machine is then fed forward into the pile.

the face. In tunnel driving positive ventilation can be maintained by mechanical means. It should be permissible likewise in coal mines.

For instance, in driving narrow rooms, such as those shown in Fig. 7, a blower should be provided on the butt entry, fitted with a canvas tube reaching up to the face. This tube can either be extended as the machine advances, or, brattice cloth can be employed. This is really a safer procedure and insures a better supply of air than is available by the use of crosscuts. Furthermore, in entry driving it saves stopping up a great number of cross passages. It also effects a considerable saving in the cost of ventilation, as it is difficult to prevent leakage through stoppings.

## Why Fuss with Your Planimeter Scale?

CHANGING the planimeter vernier to suit different scales introduces possibilities of error and takes time. It is better to leave the vernier in place and multiply the result by an appropriate factor.

The accompanying table gives the factors by which planimeter readings must be multiplied when the instrument is set to the equivalent of 1 in. = 100 ft., to convert these readings to acres. This table makes it unnecessary to change the vernier on the planimeter tracer bar when working on plats or maps of different scales. This vernier may be set permanently for a scale of 1 in. = 100 ft. and the instrument operated in the usual way. The reading when multiplied by the factor shown in the table as equivalent to the scale on the map on which work is being done will then be the area in acres.

Suppose that a Coradi planimeter with the tracer bar set at 216.00, equivalent to a scale of 1 in. = 100 ft., is being used on a map the scale of which is 1 in. = 30 poles, and that after tracing a certain area the instrument reading is 0111. The factor shown on the table as being equivalent to the map scale is 0.05625. Accordingly multiplying the instrument reading by the factor we have: 111 × 0.05625 = 62.4375

This is the number of acres in the area traced.

To obtain the proper factor for any map scale not shown (when the planimeter is set for 1 in. = 100 ft. as previously stated) the following formulas may be used:

$$F = (S^2 \div 100) \div 43,560$$

$A = F \times R$ , where  $R$  = reading of instrument,  $S$  = scale of map or plat in feet,  $F$  = the factor and  $A$  = area in acres.

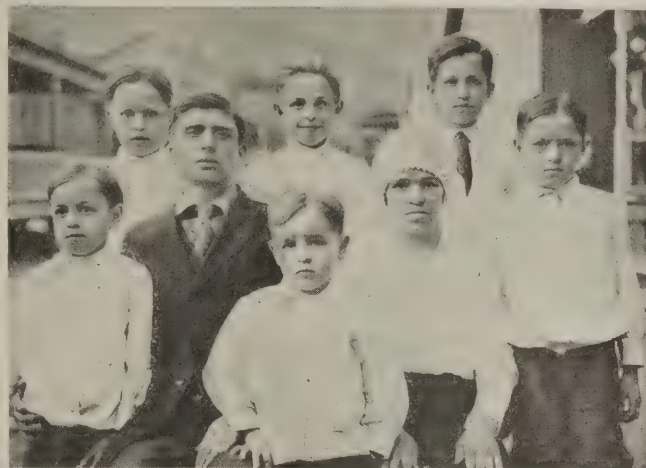
### Planimeter Table

Table of Factors for Determining Areas in Acres When the Planimeter is Set for Equivalent of 1 in. = 100 ft.

Map Scale (Poles and Miles per Inch) (Pole equals 5 1/2 yd.)	Map Scale in Feet per Inch	Factor
	10	.060022956841
	20	.00091827364
	25	.000143480257
	30	.00020661157
	40	.00036730945
	50	.00057392103
	60	.00082644628
	70	.00112488522
	75	.00129132231
	80	.0014692378
	100	.0022956841
	125	.0035870064
	150	.0051652892
	175	.0070305326
	200	.0091827364
	250	.014348025
	300	.020661157
20 Poles.....	330	.025000000
	400	.036730945
30 Poles.....	495	.056250000
	500	.057392103
	600	.082644628
40 Poles or 1/2 mile (St.).....	660	.100000000
50 Poles.....	825	.156250000
60 Poles.....	990	.225000000
	1,000	.22956841
	1,200	.33057851
	1,250	.35870064
1/2 U.S.G.S. mile.....	1,302	.38916529
1/2 Statute mile.....	1,320	.400000000
	1,500	.51652892
100 Poles.....	1,650	.625000000
	1,750	.70305326
	2,000	.91827364
	2,500	1.4348025
1/2 U.S.G.S. mile.....	2,604	1.5566611
1/2 Statute mile.....	2,640	1.6000000
	3,000	2.0661157
3/4 U.S.G.S. mile.....	3,906	3.5024876
3/4 Statute mile.....	3,960	3.6000000
	4,000	3.6730945
	5,000	5.7392103
1 U.S.G.S. mile.....	5,208	6.2266446
1 Statute mile (320 poles).....	5,280	6.4000000
	10,000	22.956841
2 U.S.G.S. miles.....	10,416	24.906579
3 U.S.G.S. miles.....	15,624	56.039802
4 U.S.G.S. miles.....	20,832	99.626313
5 U.S.G.S. miles.....	26,040	155.66611
7 U.S.G.S. miles.....	36,456	305.1558
8 U.S.G.S. miles.....	41,664	398.50525
9 U.S.G.S. miles.....	46,872	504.35844
10 U.S.G.S. miles.....	52,080	622.66446
16 U.S.G.S. miles.....	83,328	1,594.0210



The Type of Families the Mines Are Losing—The Father Once Was a Record Coal Loader, but Today He Lives in Cleveland



The Three Older Boys Now Are in College and Two Are in High School—For These the Coal Mines Must Find Substitutes

## Coal Loaders—Where Are We Going to Get Them?

Education and Non-selective Immigration Are Reducing the Number of Active Coal Loaders in the United States—These Must Be Replaced by Mechanical Loading Machines or Some Other Steps Must Be Taken

BY WILLIAM A. BUTLER  
Charleston, W. Va.

**M**UCH effort has been expended in the education of mine employees. Let us not hope that for any reason the intensive drive for better education and more of it will slacken, no matter how forcibly we may recognize the fact that education is reducing day by day the number of coal loaders in the United States.

I have given this problem particular attention for the last few years and have studied the ideals of the best coal loaders at many mines and not a one of them have I found that expects his son to be a coal loader. He is educating him, training him and pounding into him day after day the necessity of earning his living in some occupation more desirable than coal mining. He shrinks from the very idea of his boy being a miner.

You may canvass a mining town of almost any size from end to end and question the parents of every boy in the place, and I do not believe you will find a single parent that will tell you that they want their boy to be a miner. You may find a few of the newly-arrived foreigners that do not have the higher ideals of Americanism are content to have their sons follow the employment in which they are engaged, but every foreigner who has reared his children in the United States and has placed them in our schools, is going to hope and expect his or her children to be more than coal loaders. Nevertheless, though education is making problems for the coal operator which give him much concern, he can only praise the ambition of these foreign-born citizens and lend them a hand in the elevation of the boys of the coming generation or generations.

It is the unselfish nature of every true American and a trait that I do not doubt will win in the end, for as the old-time miners are diminished, the mechanical loading machine will take their places.

No one will venture to say that the coal operator is selfish in this matter. I have yet to see the operator who

fails to encourage better education, better living and higher ideals. Never have I seen an operator who tried to teach the coming generation the best way to load coal. He may show the present-day loader the best way to perform his task, but he does not offer any such schooling to the coming generation.

In many sections of the country today, the coal operators are paying out much money to promote better schools and to provide more of them. I know of many companies that for the purpose of building good schools, paying a part of the teacher's salary, furnishing janitor service, athletic equipment, etc., are even adding their contribution to the state and country allowance for education. They are determined that the children of their employees shall have the best possible educational advantages.

### BOY WITH GOOD EDUCATION WILL NOT MINE COAL

They know the boy that gets a good education is not going back in the mine to load coal; they realize that the boy that finishes high school and goes to college is not likely to remain in their organization, yet, they do all in their power to make that boy a finished product. That cannot be called selfishness. It is rather an exhibit of unadulterated Americanism. However, it is reducing the number of active miners in the United States and that fact cannot be denied.

Every year, hundreds of miners are drifting from coal loading into other industries on account of the irregularity of the business. Owing to poor market, poor car supply, strikes and other causes slack runs are, as we all know, frequent visitors in the coal-mining industry. This fact forces the miner to seek employment in other lines of work, and many of them never return to the mines.

Where are we getting the miners to replace those that are growing too old to load coal? Where are we



going to get the miners to replace those that have bought farms and have given up mining or have moved to the cities and taken up factory work in order to give their children the advantages of attending college? Where are we going to get the miners to replace those that have been absorbed by the automobile industry?

Whence are men coming to replace the miners that have made their little "roll" and left for the old country where they will be considered wealthy? We are not going to get them. We shall have to make machinery take their places. Men are not leaving the cities to go to the mines to learn the business. Few men are going to the mines from the farms. The class of immigration we are getting will not fill the vacuity, so where can we turn? Either to machinery, or to better immigration laws.

A survey of the number of miners in the United States today would show enough to supply every demand if they were active miners, but when you go into an employment office to recruit miners you will find that about 75 per cent of these men will try to obtain almost any other kind of employment before they will accept coal loading, and if they are unable to obtain any other kind, some of them then take loading as their last resort; but just as soon as they are able to locate other employment they throw down the shovel and bid the mine *adios* unless they are forced back to the mines by slack work in the factories. You can not possibly class these men as dependable miners. They cannot be relied upon to be at the mines when they are most needed.

We are getting a few miners from Mexico, and according to W. L. M. King, Premier of Canada, some are coming from the Dominion, but, all these combined will not begin to supply even a part of the leakage caused by any one of the sources just mentioned.

Within the past four months, I have interviewed approximately 10,000 men, and I think I would be safe in saying that, though at least 40 per cent of these men have been experienced miners in the past and have followed that line of work all their lives, only about 3½ per cent of them accept positions as coal loaders. In the particular section where I have been located, business has been a little slack along other lines during the past few months, and the employment agent had nothing else to offer them, so the other 96½ per cent walked away unemployed.

It could not be said that this was because the mines to which they were to be transported were undesirable; on the contrary they were among the best in the country and consisted of about forty different mines in different sections belonging to several different companies and operated under various systems. Almost all these men were willing to accept positions near some city that would only pay approximately 70 per cent as much as the mines offered and in most instances the living in the mining region was much cheaper.

It seems that since the signing of the Armistice, men have acquired the city and automobile craze, and it's not only the miners—we've all got it. I know one large coal corporation that during the past few years has had much trouble with this lust for city life.

Their men would make a little stake and go to the cities to blow it in. When their money was spent they would apply to an employment office which they knew represented the company, and the employment office would then have to wire back to the company to know if "John Doe" was a good man, and if it would be satisfactory to ship him back.

This caused so much trouble that the company started issuing what are known as "Identification Certificates" to men who are leaving to "spend their wad" and have made a good record with the company. These certificates certify that the man has been a loyal employee and that the company will be pleased to have any representative employment office advance him fare back to the mines if he applies for it. The certificate shows at which mine he was employed and has a list of plants of the corporation. It must be signed by the superintendent under whom he has been employed and countersigned by the general superintendent or director of personnel. On the reverse side is a list of employment offices throughout the country which represent the company. It is an extended list, for the company has arranged to have employment representation in almost every section of the eastern part of the United States. These certificates are issued in a nice leather card-case of neat appearance.

It is not necessary to call your attention to the fact

that the whole world has gone automobile crazy, but I want to relate a little experience I witnessed recently. A certain coal company gave a newspaper an advertisement which should have read: Wanted—Five first-class trackmen. The paper in printing the advertisement made a typographical error and the advertisement read: Wanted—Five first-class truckmen.

This one little *u* instead of *a* in the word "trackmen" brought in 150 applications within 24 hours. Some of the applicants were experienced, some partly experienced and many of them wanted to know if it would be possible for an inexperienced man to get on that job. The "ad" was promptly corrected and ran for three days and one trackman was employed.

This was not a case of there being lots of "truck" drivers and no trackman, for many of the men that applied for the truck job professed to be first-class trackmen, but did not want the position, but would take the truck driving in preference, about which in most cases they knew little. Truck drivers in that section were getting \$4 a day and the trackmen were offered \$6.80. This is only one of many similar instances I have witnessed in the past year or two.

#### WILL MECHANICAL LOADERS BE PERFECTED?

I know one mining district, where even though the roads have been almost impassable most of the year, recent statistics show more cars per capita than in any other place in the United States.

I believe, as I previously stated, that some day the mechanical loader will supplant the present man power, but the supply of experienced coal miners is diminishing faster than the coal-loading machine is progressing, keeping in mind the practicability of the mechanical loader in all kinds of coal beds.

**C**ANADA will take only such immigrants as she wants. We take whatever offers. In Warsaw applications were filed by twice as many women as men. Only 3 per cent paid their own steamship passage. Dressmakers, tailors, seamstresses, shoemakers and clerks formed 87 per cent of the skilled applicants.



It seems as though something will have to be done to tide us over the period until such machines have been developed. The perfecting of this equipment will take many years, but the time is coming when the mechanical loader will be considered just as essential as the cutting machine and locomotive of today.

Several loading machines are already on the market that have proved to be fairly successful in seams of coal where conditions are good, but these ideal mines are being worked out day after day, and a machine must be designed that will be adaptable to mines having less favorable conditions.

#### SEVERAL MACHINES ON THE MARKET NOW

The Joy digging and loading machine, the Myers-Whaley shovel, the Holmstead loading machine, the Dillig Tractor Loader, the Jeffrey Heading Machine and several others have given fair results under favorable conditions. But when we say they are not adopted to all operating conditions, we must remember that the first cutting machines were satisfactory only where conditions were favorable, but now can be used in any kind of coal from a 2-ft. seam up. Today, they can cut the coal on the bottom, in the middle or the top.

In summing up the problem I have only one way out and that is through proper immigration laws. In thus speaking, I don't mean for a minute that we should open up a flow of immigration that would flood our country with unskilled people, for we are having too much of that now and to do anything that would bring more unskilled labor to the United States at this time, and skilled labor that is not needed, would be one of the worst things that could happen to the country from a labor standpoint.

Neither do I think it necessary to increase the present quota of 2 per cent, but I do mean that we should have immigration laws that will regulate this 2 per cent to a restrictive and selective process, permitting only the classes of immigration that are actually needed for the good of our own nation, instead of admitting men that happen to be able to speak forty words in English and can pass the physical examination.

#### CANADA'S RESTRICTIVE AND SELECTIVE SYSTEM

For some time Canada has had restrictive and selective immigration laws in operation, and Canadians are well pleased with results obtainable. Their system is not based on a quota. It excludes the classes of immigration that are not needed, and until the demand is filled places no limit on the number of any one class admitted.

Section 38 of Canada's Immigration Law almost completely covers this part of their immigration system and gives a good idea of the manner in which it is handled. I quote this section in its entirety. It reads:

The Governor in Council may by proclamation or order, whenever he deems it necessary or expedient: A—Prohibit the landing in Canada or at any specified port of entry in Canada otherwise than by continuous journey from the country of which he is a native or naturalized citizen, and upon a through ticket purchased in that country, or prepaid in Canada. B—Prohibit the landing in Canada of passengers brought to Canada by any transportation company which neglects to comply with the provisions of this act. C—Prohibit or limit in number for a stated period or permanently the landing at any specified port or ports of entry in Canada, or immigration of any specified class or occupation by reason of any economic, industrial or other condition temporarily existing in Canada, or because such immigrants are deemed unsuitable having regard to the climatic, industrial, social, educational, labor or other conditions or requirements of Canada, or because such immigrants are deemed undesirable owing to their peculiar customs, habits, modes of life and methods of holding property, and because of their probable inability to become readily assimilated or to assume the duties and responsibilities of Canadian citizenship within a reasonable time after their entry.

Summed up, Canada's arguments on immigration law stand like this, according to an article recently published on the subject: "Canada's policy on immigration is conditioned by her own needs. At the present these are the development of her vast agricultural resources, for her prosperity along other lines is contingent upon agriculture. In consequence she wants immigrants of the settler type, nation builders. She actively seeks and goes after settlers of this sturdy nation-building type. She reserves to herself the right of a sovereign government to restrict immigration and to exclude those whom she cannot absorb or who do not fit into her needs."

At the time she was in need of settlers only, only settlers were permitted to enter her ports of entry, and this class of immigration the government actually sought. It advertised in over 4,000 magazines in an effort to attract this class of immigrants. However, the true character of this restrictive system of immigration was not apprehended by everyone interested, for after the fiscal year 1920-1921, when the system was put into effect, 30 per cent of the immigrants arriving at Canadian ports of entry were rejected and in the year 1921-22, 39 per cent were rejected.

This, of course, had a tendency to frighten away the class of immigrants the Dominion really wanted. Besides that, it caused much inconvenience to the would-be immigrant, and it was necessary for Canada to take steps to prevent the rejection of immigrants after they had reached the Canadian borders. So, agents with discretionary powers were placed at Antwerp, Paris, Riga and Poland, and more will be placed at other ports soon, to check and sign all passports, and the Canadian companies were instructed to transport only those that had their passports signed by these agents.

#### WE GET WHAT THE OTHERS DON'T WANT

It is far from my desire to take you into a long list of statistics but I do want you to take a glance at what we are getting through our ports of entry. From July 1, 1922, to June 30 of the following year, 522,919 immigrant aliens were admitted to the United States. In the past two years I do not believe many industries could reasonably claim a shortage of common labor and yet out of the above number 275,137 were registered as common laborers and people with no trades, whereas only 5,423 miners were in the total and during that period 803 miners left this country.

Statistics show we have had a scarcity of masons but out of this half million people only 3,276 were masons and 181 masons left. From July to September, 1923, a short period, that being the last date of which figures are available, as the current year's compilations have not been completed, there were 263,259 immigrant aliens admitted to the United States and 136,683 of these were common laborers and people without trades thrown on to our labor market and only 3,035 of this quarter million were miners.

When the American consulate in Warsaw was filling the quota for 1923-24 it requested applicants for visas to fill out questionnaires; from which the following information was obtained: From more than 18,000 applicants for American visas in Poland, nearly 12,000 were women and a little more than 6,000 were men. Only 519 paid their own steamship passages, so that the passages of 17,500 were paid by relatives and friends in America. About 14,000 were unmarried. I have not heard of any distress signal being broad-



casted for barbers, tailors, shoemakers, etc., but we quote in Table I the occupation of most of these applicants:

Table I—Classes of Would-Be Immigrants to United States

UNSKILLED		SKILLED	
No occupations given.....	9,500	Dressmakers.....	810
Domestics.....	2,500	Tailors.....	573
Farm labor, merchants, etc....	2,208	Seamstresses.....	408
		Shoemakers.....	316
		Clerks.....	184
		Bakers.....	154
		Barbers.....	131
		Engineers.....	13
		Masons.....	17
		Miners.....	6
		Paperhangers.....	4
		Plasterers.....	5
		Plumbers.....	5

These figures reveal facts that are worthy of serious consideration. They show what a small percentage of the immigrant aliens being admitted to the United States are really needed and the large number that are not needed, but must be cared for once they are admitted. Industrial reports show that we have a scarcity of engineers, masons, plasterers and plumbers. Sum up these and see how much relief was obtained along this line from over 18,000 immigrants. Look over this list and I believe anyone will agree that such unrestricted immigration is more of a burden than relief.

James B. Howard, President of the National Transportation Institute, said at the recent convention of the American Farm Bureau Federation at Chicago:

## The Miner's Torch

### Questionnaire for the Hasty

**S**UPPOSE you were a company superintendent hooked up to a wife who felt competent to pass on your camp's requirements in welfare and social-service work and furthermore this same wife happened to be the kind of a wife who was not satisfied with simply knowing what ought to be done.

Now suppose that without warning and without request on your part comes a trained social-service worker from the general office of the company who looks over the situation and within a day or two informs you that all of your efforts have been wasted and suggests furthermore a complete change of activities and requests modestly a free hand to proceed without interference. And to back up the notion certain notices are suggested for display so that everyone may be properly informed as to the newcomer's position and authority.

What would you do about it?

Suppose you were a company engineer and unexpectedly a man should walk into your office bringing a letter of introduction from the general manager of your company stating that the company had given an option on its property to another concern represented by the bearer (a mining engineer instructed to make a complete inspection of the company's property) his findings and recommendations to be taken as final. And suppose further that you knew that if you gave this man, sent to inspect the property, all of the facts in your possession, explaining the whys and wherefores of all of the funny looking crooked entries on the mine maps and the

"Unless something is done about the immigration laws to bring more farmers into this country, other countries will soon have all of America's farm products' export trade as the immigration laws are restricting the development of farming to such an extent that other countries are offering better asylums for the crowded-out Europeans, and big colonies are developing large areas in South America as well as in Canada, Australia, Africa and Mexico."

We should find out what we really need, then go after it. We should fill our quota with the class of immigrants that will mean prosperity to the United States, instead of bringing in a class of workmen that will be a source of difficulty to our government in trying to care for them.

A report just made public by the Department of Immigration and Colonization of the Dominion of Canada says that since 1901 Canada has received 3,739,749 settlers, most of whom settled on farms in Western Canada. Of these 1,417,860 migrated from the United States, 1,396,609 from the United Kingdom and 925,278 from other countries of the world.

Are we going to continue to take the riff-raff and rabble of the world to raise, educate and elevate at the expense of our nation's industrial efficiency, or are we going to select and restrict until we have succeeded in placing and organizing those less desirable immigrants who already are within our domain?

blank spaces also, the deal would be sure to fall through.

What would you do about it?

Suppose you were a mining town preacher with a large family dependent on you for support and this support came to you through the route of monthly collections received by the treasurer of your church in payment of pledges made by the members at an annual meeting of the church fathers. The source of these subscriptions would probably be divided about as follows: One-third from bosses, office men, superintendent, etc., while the other two-thirds would come from miners and day men. Suppose further that the church treasurer happened to be the chief clerk in the superintendent's office. (In passing I might state that this last supposition does not require any wild stretch of the imagination). And continuing the supposition, suppose that one fine day out of a clear sky you should discover that the company officials were not giving their employees exactly a square deal; and yet the employees were not aware of the attitude of the officials toward them and their interests.

What would you do about it?

Or reverse the above and suppose that you discovered that the men were not giving their officials whole-hearted support on a matter that had been agreed between them, which fact had not yet been discovered by the employers. (I might add that judging from my experience the first supposition happens seldom, while the second happens a little oftener than seldom.)

What would you do about it?

CARLISLE SPEDDING, prior to taking charge at Whitehaven, England, disguised himself as a hewer and worked in a Newcastle mine. Burned by firedamp, his identity was disclosed and he returned to Whitehaven to originate the "coursing of air" and, in 1750, the "steel mill."





Main-Conveyor Drive and Control Panel, Baker Breaker

## Baker Electric Plant Guarded Against Breakdown

Two Circuits of Over Four-Thousand Volt Current Supply Breaker—Provisions to Keep Equipment from Dust—Impellers for Twenty-Foot Lift at Jigs Designed so as to Prevent Slate in Water from Wearing Pump Parts

BY EDGAR J. GEALY

Electrical Editor, *Coal Age*, New York, N. Y.

**A**LMOST every possible means to provide continuity of service, safe operation and efficient use of power, were incorporated in the plans for the new Baker colliery. The coal now being prepared at this colliery comes from two other mines, the Dodge and National, which originally prepared their own coal.

Although these mines did not have completely electrified breakers their output was mined and transported by electricity. A delay to operation at the Baker colliery is therefore more serious than at other collieries which merely prepare their own output. The electrical equipment of the Baker colliery has been designed to handle the full 4,000-ton capacity of the breaker and like many other breakers will actually handle twice this amount if the flow of coal to the breaker is fast enough.

Two 4,150-volt feeder lines supply electrical energy from the Hampton power plant to the Baker colliery. One of these lines is called the Baker-Dodge-National circuit because it supplies power to each of these places. The other line runs over a different route from the power plant directly and therefore provides a duplicate circuit. Either of these circuits will carry the total load in an emergency.

The Baker-Dodge-National line runs direct to a point in the old Dodge colliery yard, there it divides and a branch turns off to the National mines. The other circuit runs through the Dodge yard where a tap is taken off to the operations in that vicinity. The main line continues to the Baker colliery where it connects with the other circuit from the power plant.

### FOUR CIRCUITS AT THE NATIONAL MINES

The circuit to the National mines ends at a distributing point consisting of four distributing circuits. One branch supplies a 150-hp. fan motor through three 100-kva. transformers, another goes to three 200-kva. 4,150/440-volt transformers which in turn supply energy to three centrifugal pumps. Two of these pumps

are rated at 1,500 gal. per minute and are driven by 150-hp. motors; the other has a capacity of 3,800 gal. per minute and is driven by a 250-hp. motor. Another circuit enters the mines to supply a 112-hp. hoist motor in the Clark bed.

Outside in a brick building are two rotary converters, one is a 200-kw. unit and the other a 300-kw. machine. Both rotaries supply 275-volt energy to the mine trolley system which is directly connected with the inside trolley system of the Baker, Dodge, Taylor and Holden workings, the last two places being mines adjoining the National and Dodge operations.

The high-voltage system at the old Dodge colliery divides into two branches, one supplies a bank of three 200-kva. transformers which furnishes 440-volt energy to the outside shop, two 75-hp. outside fan motors, and a circuit to the inside of the mines which feeds one 100-hp. synchronous pump motor, one 100-hp. induction-type pump motor and a 30-hp. hoist motor.

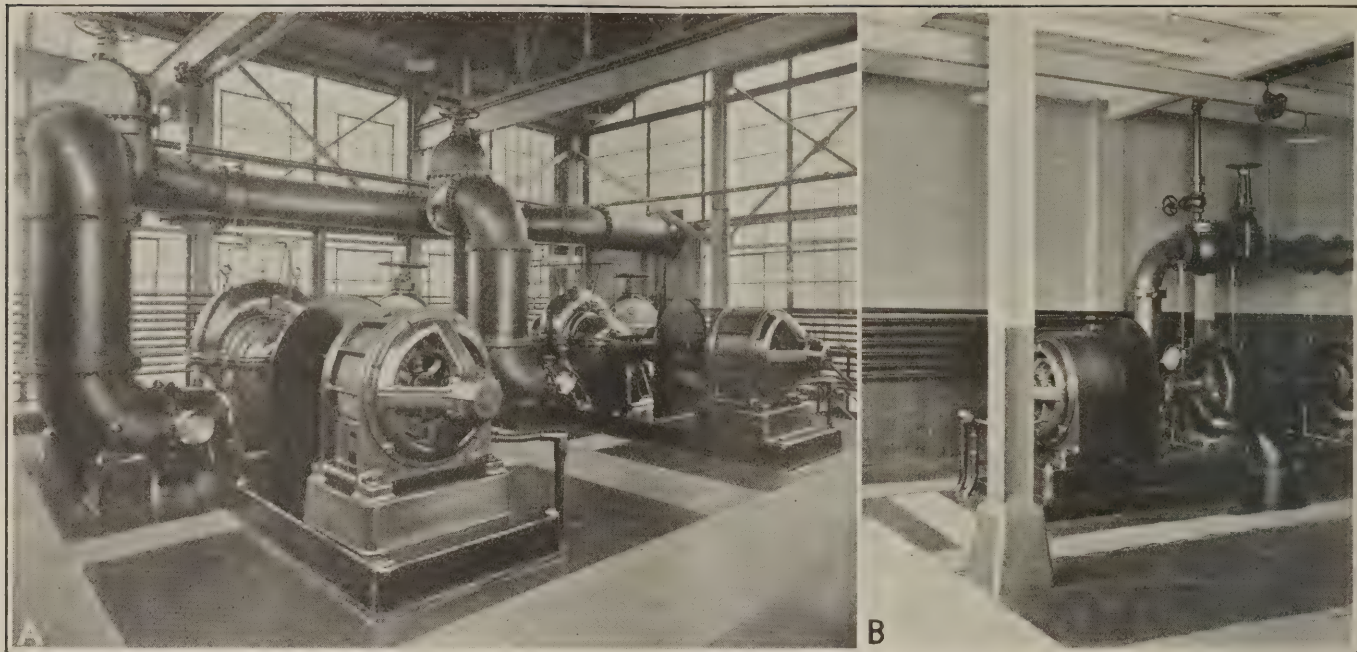
A 500-kw. rotary supplies the direct-current equipment, in the Dodge mines and also feeds into a super-power network supplying 275-volt direct-current energy to ten other operations of the company spread over a territory nearly 5 miles in diameter. The equipment directly operated from the Dodge rotary consists primarily of seventeen trolley locomotives, eight track pumps, four 50-hp. coal cutters, one 80-hp. hoist, four conveyors and one air compressor.

The beds being mined in the Dodge section are the Four-Foot, Diamond, Rock, Big, New County and Dunmore No. 2. These are given in the order in which they occur. The Four-Foot bed is nearest the surface and outcrops at a point about half way between the Dodge shaft and Baker colliery. The coal from the Dodge workings is not raised to the surface at the shaft but instead is hoisted to the Four-Foot bed where it is taken on a level grade to the outcrop and then transported over the surface to the dump house at the Baker colliery.

There is still another mine associated with the Baker inside operations. This is the Oxford, more popularly known as the old People's Coal Co. mine. The electric power used here is supplied from a 4,150-volt circuit

NOTE—Fig. A in headpiece shows one of the largest single drives in the Baker breaker. By separating important machinery and having individual drives the hazards of the breaker are lessened. Fig. B shows the control panel for this drive which makes it possible to run the motor in either direction at almost any desired speed. Control equipment located near the motor and the conveyor is used whenever a quick stop is necessary or repairs are being made.



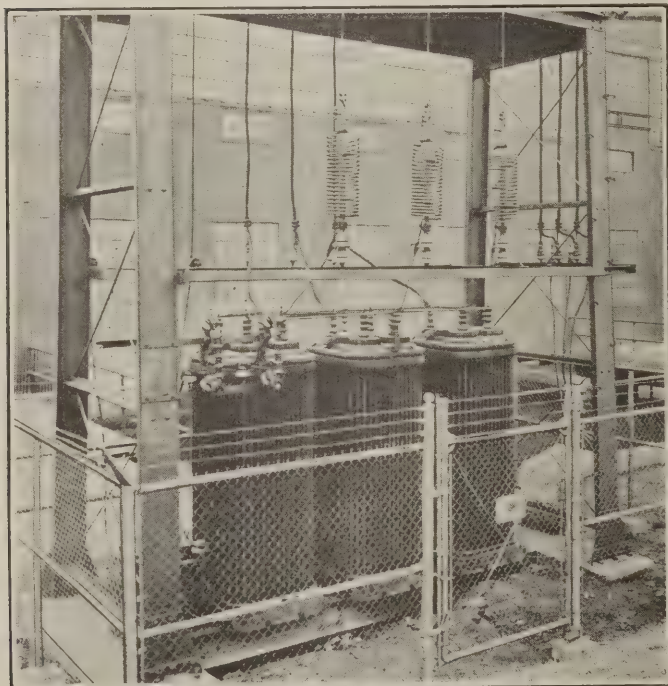


### Large Water Circulating and Pressure Pumps Supply Baker Breaker

A spare pump has been provided for each service. The circulating pumps shown at A have a greater capacity than any other pumps owned by the company. These units supply water to the jigs. The pressure pumps shown at B furnish water for the screens, shakers and pressure lines in the breaker and annex.

running from the Hampton power plant to the company shops and offices in the central part of the city of Scranton. Three 667-kva. transformers supply power to a 4,500-gal. per minute centrifugal pump driven by a 1,000-hp. motor and another 100-hp. pump located inside the mines for emergency purposes. On the outside a three-phase 100-kva. transformer supplies the ventilating fan and hoist motors. A 300-kw. rotary supplies 275-volt direct-current energy to the inside feeders which connect directly with the Baker and Hyde Park mines.

At a large tower near the Baker breaker the two



### Transformers Supplying Power to the Baker Colliery

Two circuits furnish power from the Hampton Plant to these transformers. Either circuit will carry the entire load. Located outside the breaker in a clean place, these units give no trouble, yet they easily can be replaced should an accident occur.

power circuits from the Hampton plant are tied together. Switches have been provided so that the energy can be taken from either line and the other cut off for repairs. The principal circuits from this tower supply the breaker, a fan, boiler house, a hoist, inside equipment and the power-converting substation.

Three 400-kva. transformers step the voltage from 4,150 to 440 volts for a 200-hp. fan and the breaker motors. One 200-kva. three-phase transformer on another circuit supplies an outside slope hoist which hauls the coal from an upper bed to the surface. Another bank of three 400-kva. transformers furnishes energy to a 300-hp. supply shaft hoist and also to the inside pumps which raise the mine water from the Dunmore bed to the breaker reservoir. Two of these pumps are centrifugal units rated to deliver 2,000 gal. per minute. Each pump is driven by a 300-hp. 440-volt motor. On another alternating-current inside circuit are two 75-hp. pumps which are used to assist in gathering water for the sump of the large pumps.

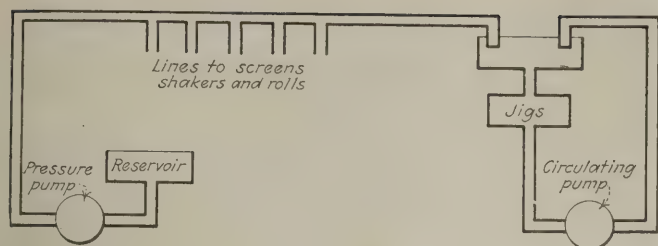
The direct-current voltage used in the mines is supplied from a large brick substation located near the hoisting engine of the main shaft. In this substation there is a 750-kw. motor-generator set and a 500-kw. rotary. The larger unit runs in the day, and the smaller machine is held in reserve. At night the rotary is put in service and thus it is always kept in operating condition.

Like the other direct-current stations in this group of collieries these machines are tied into a common direct-current superpower system. Both of the machines are provided with the usual overload, reverse-current and over-speed devices, which are especially necessary on this inter-connected system.

The direct-current equipment used inside the mines consists of twenty-four trolley locomotives, twenty coal cutters, fifteen track pumps, two air compressors, one car-haul hoist, one 100-hp. pump, one 160-hp. hoist and many electric lamps.

All the motors in the breaker are 440-volt, three-phase, 60-cycle units. They vary in size from a 5-hp.





### How Large Volumes of Water Are Circulated Through the Baker Breaker

The circulating pumps are placed so that the height the water must be raised is merely the slight difference in elevation between the water in the column line and that in the reservoir above the jigs. The pressure pumps are always primed because they are located below the reservoir.

motor on the vacuum heating system to a 300-hp. motor on the main conveyor. Nearly all the motors are of the inclosed type and are fitted with conduit-box connection from which a short piece of flexible conduit extends to the rigid conduit set in concrete. There are thus no exposed conductors.

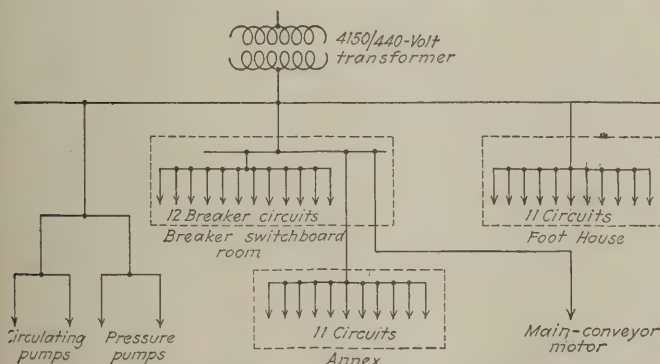
### TO KEEP ELECTRICAL EQUIPMENT FREE OF DUST

So that the electrical equipment will be safe and free from dust many of the motor starters are either hand-operated auto-transformers or push-button automatic starters. The larger motors are equipped with master drum controllers so that the speed may be gradually increased under load or inching can be done while making repairs. Important apparatus driving conveyors, which might under some circumstances cause danger or serious damage, are provided with emergency stop buttons. These control points are provided where they are most convenient. The starters for nearly all the motors are provided with some means for making a quick stop in emergencies.

From a distributing point outside the breaker the 440-volt lines radiate to three different points, one to the foot house, another to the main part of the breaker, and the other to pump rooms.

From an inclosed switchroom in the foot house are eleven different circuits which supply an equal number of motors as follows:

One	25-hp.	Car haul
One	50-hp.	Outside slope conveyor
One	25-hp.	Main shaker
One	35-hp.	Small rolls
One	75-hp.	Main rolls and picking table
One	25-hp.	Rock conveyor
One	75-hp.	Condemned coal conveyor
One	50-hp.	Lip-screen conveyor
One	50-hp.	Rock conveyor from breaker to bridge
One	75-hp.	Rock conveyor on bridge
One	75-hp.	Coal conveyor from pulverizer and lip screen



### How the Breaker Circuits Are Divided

Each motor circuit is doubly protected by relays, switches and fuses located in separate control rooms or near the motors. These control rooms are completely enclosed fireproof compartments. Automatic doors keep these rooms closed off from all other parts of the breaker.

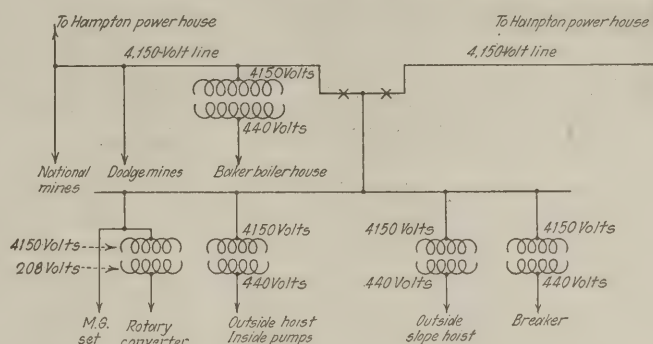
The breaker switchroom circuit is first divided into three parts. One supplies the 300-hp. motor on the main conveyor; another supplies fourteen motors in the annex as follows:

One	75-hp.	Main conveyor from dump
One	100-hp.	Shakers and jigs
One	15-hp.	Conveyor to boiler plant
One	75-hp.	Rock refuse from breaker and annex
One	50-hp.	Rock refuse conveyor feeding the above
One	25-hp.	Annex rolls
One	50-hp.	Conveyor from annex to bridge
Three	75-hp.	Conveyors for fuel to boiler plant
One	50-hp.	Swinging conveyor at dump
Two	50-hp.	Jig pumps
One	5-hp.	Vacuum heating system

The other circuits from the breaker switchroom divide into twelve lines supplying the following motors:

One	25-hp.	Top middle shaker
Four	75-hp.	Twenty-one jigs
One	25-hp.	Settling tank conveyor
One	50-hp.	Top and bottom shaker (north side)
One	25-hp.	Bottom middle shaker
One	50-hp.	Top and bottom shaker (south side)
One	25-hp.	Rock conveyor
Two	75-hp.	Pulverizer

The third circuit entering the building from the outside distributing tower runs direct to the pump rooms. Here are two 200-hp. slip-ring induction motors driv-



### Power Circuits at Baker Colliery

Normally the power supply for the Baker operations is received over two circuits from the Hampton Power Plant. Either circuit is capable of carrying the total load. It is the general practice of the company to use 440-volt motors for nearly all breaker drives.

ing the pressure pumps and two 100-hp. squirrel-cage motors driving the circulating pumps.

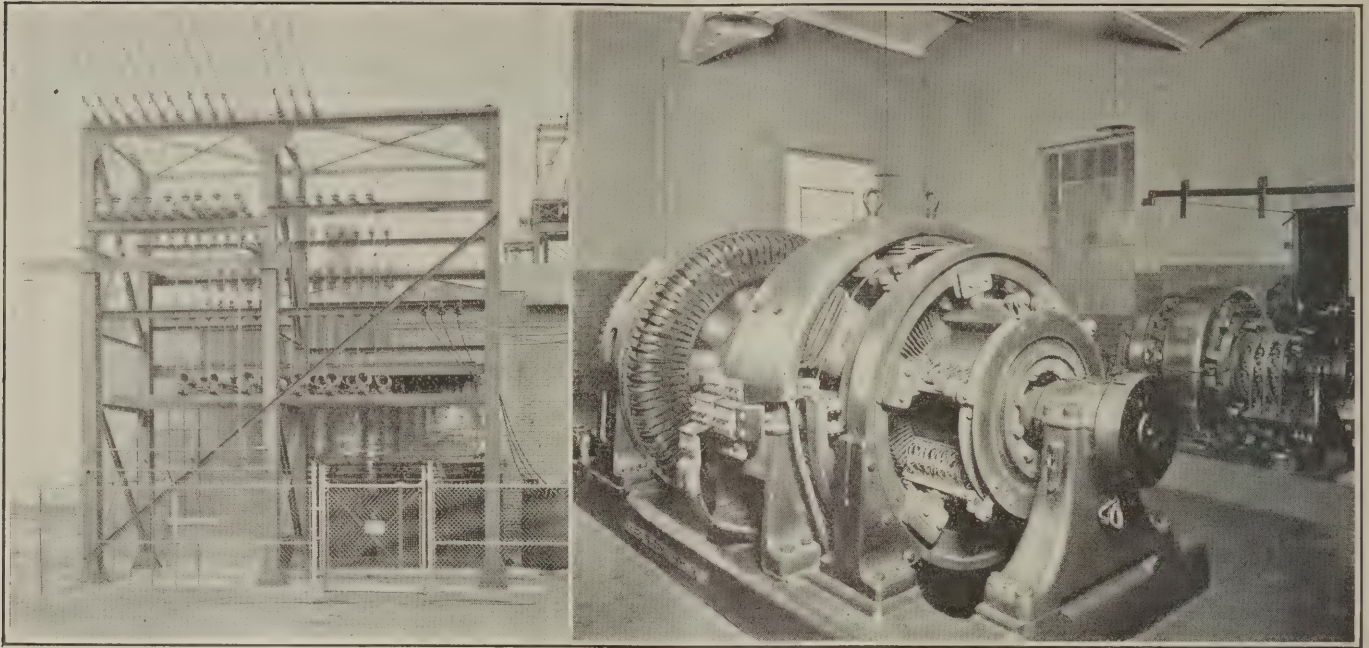
The breaker pumping system is quite unusual, every means to prevent loss of water having been provided. The pumps have been located so that they are all self primed. Each unit has been placed where the work it must do is made as small as possible so as to effect every possible saving of labor and power.

The breaker supply or pressure pumps are duplicate units, either one being capable of handling the total requirements. These pumps have a capacity of 300 gal. per minute against a 140-ft. head. The purpose of these pumps is to supply water for the shakers, crushers, lip screens, lip chutes and make-up water for the jigs.

### IMPELLERS OF CENTRIFUGALS SMALL BUT WIDE

The circulating pumps are also duplicate units, each is rated to deliver 14,000 gal. per minute against a 20-ft. head. The impellers of these pumps are of the Francis type and are extremely small diameter but very wide. They were made this way so as to minimize the wear due to the dirt and slate in the water. The low head against which these pumps operate was made possible by locating the pumps directly under the jigs, thus the pump which raises the water into the jig reservoir nowhere circulates it through pipes smaller than 24-in. diameter or to any great height.





### Substation Transformers and Converting Equipment

Here again continuity of service is important and provision has been made for emergency service. During the day the motor-generator set supplies the energy; at night the rotary furnishes the direct-current voltage. Both these machines feed into a small superpower network which interconnects the many coal mines operated by the company. The overhead charges to operate a coal breaker are large; consequently, a continuous supply of energy to the mines is essential for a steady flow of coal through the breaker.

Considering the extremely dirty water handled by the circulating pumps they have given exceptionally good service. The impellers after over a year's service show little or no wear thus justifying the use of the Francis type of impeller.

With every motor clean and free from dust or moisture, all wires in metallic conduits, control apparatus housed in fireproof compartments and all motors pro-

tected against overloads and failure of voltage the work of keeping this model breaker in continuous operation is quite easy for the one electrician employed for this purpose.

Other features have contributed to making this a model breaker but the use of electric power has made it possible to co-ordinate every process entering into the mining, transportation and preparation of the coal.

### Vancouver Fields Unusually Difficult To Work and of Limited Capacity

**PUBLIC** officials and press writers have declared the coal fields of Vancouver Island as "illimitable" and "inexhaustible," but Charles Graham in an address before the British Columbia Division of the Canadian Institute of Mining and Metallurgy shows an entirely different condition to that thus optimistically reported. The results of seventy years of surface prospecting, underground operation and extensive diamond drilling has disclosed the true status of the field.

The presence of coal on the coast of British Columbia first was made known by Dr. W. F. Tolmie in 1835, the mineral being brought to him by Indians from the northeast coast of Vancouver Island, probably from Suquash. In 1850 the existence of coal at Nanaimo was announced by J. W. MacKay. Development started in 1852 and coal was shipped before the close of 1853, the first mines being operated by the Hudson's Bay Co. which they continued to work until 1861 when they sold them to the Vancouver Coal Mining and Land Co.

It is the popular belief that the coal-bearing rocks, known as the Nanaimo series, extend undisturbed from the Sannich peninsula to beyond Campbell river and under the Gulf of Georgia, but geological examination discloses the fact that the coal-bearing rocks are restricted in that area to three principal zones, and that even these zones are not always productive. Further,

throughout a great part of the area only one zone exists, and in the remainder only two of the three are found. Instead, therefore, of the probability of finding coal throughout a zone of rocks over 100 miles long, and covering a large area over the southeast coast of the Island it is now known that the area from which future production must depend is extremely limited.

In Vancouver Island many faulted and barren areas occur when the coal seam is too badly disturbed or too thin to permit of economical operation. In the Comax district, summits of the underlying pre-Cretaceous rocks project through certain parts of the seam. These knobs evidently stood above the general level when deposition was proceeding. They not only form areas of no value in themselves, but have considerable effect on the seam for some considerable distance, and interfere greatly with the general scheme of operations.

Mr. Graham shows that in one mine only 47 per cent of the coal could be recovered and in another the recovery from 365 acres has been to date less than 11 per cent of the coal supposed to be available. In the barren portions of this latter mine the roof and floor meet, completely eliminating the seam; at other points the space between the roof and floor, which naturally should be occupied by the seam is silted up by mud and fine shales. The coal seams are badly intermixed with bands of shale. Whether the coal is shot or loaded without shooting, the shale is brought down and mixes with the coal, making the finer parts of the product exceedingly difficult to clean.





## News Of the Industry



### Interallied Conference Seen as Key to Industrial Prosperity

American Coal Leaders Hopeful of Adjustment of European Situation—  
Steel Corporation's Unfilled Orders Show Extent of General Depres-  
sion—Agriculture's Comeback a Reassuring Development

BY PAUL WOOTON  
Washington Correspondent of *Coal Age*

Leaders in the coal industry are praying for the success of the Interallied Conference in London. There can be no return of industrial prosperity in the United States, they believe, until the European situation is composed. Stagnation in the coal industry is greater than at any other time in its history. There now is a larger percentage of idle coal-mine capacity than in the latter part of 1914 and early 1915, when the first effects of the war caused a great depression. To find any date when the unfilled orders of the United States Steel Corporation were as low as on June 30 it is necessary to go back to November, 1911. This is of more significance than the rapid drop in the production of pig iron and ingots, because the unfilled orders give no promise for the months to come.

There are two very comforting things, however, in the situation. One is that we have slid down hill with great rapidity since March without having been jolted or jarred. The other is the remarkable comeback being staged by the agricultural industry. American farmers apparently are going to have a fairly large profit on most of their products this year. It is true that much of that will have to be applied on debts contracted during the long series of lean years. With all that, however, the purchasing power of the farmer is going to be much greater from this time on.

#### Must Sell More Abroad

Many coal men are convinced that we cannot have sustained prosperity by taking in each other's laundry. To maintain our prosperity we must sell more abroad. When we sell abroad we must take our pay in gold, promises to pay, commodities or services. We now have most of the gold. It would threaten the continuance of the gold standard for Europe to have to part with any further considerable amount of its basic treasure. We have extended credit to Europe in excess of \$20,000,000,000. The point is being reached where we no longer can continue to accept credit documents. We cannot continue to take gold without laying ourselves open to a major catastrophe. Many believe the time

has come when we must begin to take more of our pay in commodities.

Shipping, insurance and other services, in addition to the expenditure of Americans abroad, do not go far toward meeting the situation. A generally held opinion among coal men is that not only must the Dawes plan be made effective but we must do our part by a scientific revision of our tariff. The thought is that we have drawn largely on the substance of the world. The demands which we had to supply during the period of reconstruction in Europe have resulted in a degree of prosperity here, but from this time forward our own prosperity is going to depend upon the prosperity of our neighbors.

While it may be that there are many operators of coal mines who do not see in their own situation a reflection of the European situation, representatives of the coal industry whose duties require them to mingle largely with the men engaged in production are agreed that the industry has within it an unusual percentage of men who follow through to their source the influences which affect the demand for coal and which will affect future demand. For that reason many coal operators are following the proceedings in London as closely as they watch the steel trade and other more immediate barometers. There is a feeling of confidence that the Dawes proposal will be put in operation.

The only fear is that France may demand the impossible in the way of guarantees for its protection once Germany is economically restored. Incidentally there are many coal operators who think that much of the post-war depression in Europe could have been avoided and the travail of the Ruhr escaped had the United States been willing to ratify the treaty guaranteeing France against unrighteous aggression.

The fall convention of the American Chemical Society will be held at Ithaca, N. Y., Sept. 8-11, 1924. The Gas and Fuel Section is arranging as part of the program a round-table discussion on "The Storage of Coal and Spontaneous Combustion." Prof. S. W. Parr, of the University of Illinois, will lead in the discussion.

### Henry Ford Buys Dock At Last

A deal was closed July 16 by which Henry Ford acquires complete ownership of the dock of the defunct Superior Coal & Dock Co. at Superior, Wis. It was at first announced that the Ford interests had leased the property, but within a few days the outright purchase had been arranged. The Ford interests assume full responsibility for the outstanding bonds, including all back interest and overdue retirements, and will lift a mechanics' lien of \$175,000 held by the Brown Hoisting Machinery Co. and will pay off certain other accounts. The exact purchase price of the dock was not given out but it is known to be in the neighborhood of \$780,000. Mr. Ford is now in the lake coal trade. He has two large new vessels in the water and two more building. They are Diesel-engine driven.

### Union "Army" Closes Mine, Threatens Another

An armed band of about 100 miners on July 18 descended on the Kali-Inla mine, at Cambria, on the Pittsburg-Latimer county line, Oklahoma, overpowered the guards at the mine and forced a non-union crew to quit work. The guards were disarmed and forced to accompany the assailants as they motored into Latimer County after the attack.

The invading party assembled at Cambria several hours in advance and cut telephone wires into the little settlement before proceeding to the mine workings. It is understood that the attack was made by miners from Texas fields, Henryetta, Okla., and other mines nearby.

The Kali-Inla mine, after a long suspension, had recently resumed operations on the basis of the 1917 wage scale, which was opposed by officials of District 21, United Mine Workers.

A threat of similar action on the following day was conveyed to employees of the Deegnan & McConnell mine, Wilburton, Okla., which also is operating on an open-shop basis. The invasion failed to take place, however, and 100 men went to work. After several hours had passed without the appearance of the invaders, Sheriff Parks said he believed that any danger was over.



## Coke Output Low in June With Iron and Steel

In company with the production of iron and steel, the output of coke was reduced sharply in June. The total quantity produced was 2,958,000 net tons, of which 2,403,000 tons was from byproduct ovens, and 555,000 tons from beehive ovens. Comparison with May shows decreases of 14 per cent and 27 per cent respectively.

The present monthly rate of byproduct coke production is 23 per cent below the average for 1923 and is less than at any time since early in 1922. The average daily output in June was 80,087 tons, a decrease of nearly 11 per cent. The relation of production of capacity was 66.4 per cent. Of the 71 byproduct plants in existence, 66 were active and 5 were idle throughout the month. Ovens affiliated with iron furnaces produced 80.7 per cent of the total output.

Activity at the beehive ovens has decreased to the point where the monthly rate of output is but 38 per cent more than the weekly rate a year ago.

### Monthly Output of Byproduct and Beehive Coke in the United States\*

Monthly Average	(In Net Tons)		Total
	Byproduct Coke	Beehive Coke	
1917.....	1,870,000	2,764,000	4,634,000
1918.....	2,166,000	2,540,000	4,706,000
1919.....	2,095,000	1,638,000	3,733,000
1920.....	2,565,000	1,748,000	4,313,000
1921.....	1,646,000	462,000	2,108,000
1922.....	2,379,000	714,000	3,093,000
1923.....	3,127,000	1,497,000	4,624,000
April, 1924..	3,010,000	1,079,000	4,089,000
May, 1924..	2,786,000	761,000	3,547,000
June, 1924..	2,403,000	555,000	2,958,000

\* Excludes screenings and breeze.

The production of coke in June required the carbonization of 4,327,000 net tons of bituminous coal, of which 3,452,000 tons was used in byproduct ovens and 875,000 tons in beehive ovens. Thus the rate of coal consumption by the coke industry has decreased 31 per cent since the beginning of the year and is now 32 per cent less than the monthly average of 1920 and 37 per cent less than that of 1923.

### Estimated Monthly Consumption of Coal for Manufacture of Coke†

Monthly Average	(In Net Tons)		Total Coal Consumed
	Consumed in Byproduct Ovens	Consumed in Beehive Ovens	
1920.....	3,684,000	2,665,000	6,349,000
1921.....	2,401,000	706,000	3,107,000
1922.....	3,421,000	1,107,000	4,528,000
1923.....	4,458,000	2,358,000	6,816,000
April, 1924..	4,324,000	1,702,000	6,026,000
May, 1924..	4,002,000	1,200,000	5,202,000
June, 1924..	3,452,000	875,000	4,327,000

† Assuming a yield in merchantable coke of 69.6 per cent of the coal charged in byproduct ovens and 63.4 per cent in beehive ovens.

## U. S. Coal Exports and Imports Decline in First Quarter

Exports of coal and coke from the United States during the first three months of 1924 were 17 per cent less than for the corresponding period of 1923, according to the Chamber of Commerce of the United States. Imports of coal and coke during the same period fell off 83 per cent as compared with the first quarter of 1923.

## Lady Rhondda Still Seeks House of Lords Seat

Lady Rhondda, Great Britain's "Queen of Commerce," is said to be preparing for another battle with the House of Lords. She wishes to assume her seat in that august assembly as a peeress in her own right, the holder of a hereditary title. She is the most persistent of some dozen British peeresses in their own right who are excluded from the House of Lords on account of their sex.

The noble lords and barons of the realm have been greatly perturbed by these clamorous ladies since 1919, when women became eligible, on a basis of complete equality with men, to all English public offices. So far, the peers have successfully preserved their precincts from the threatened inroads of women.

## Monongalia Mines Seek Cut In Baltimore Scale

A meeting of the joint board of the Monongahela Coal Association of West Virginia and the United Mine Workers held a few days ago brought out the fact that the operators who subscribed to the Baltimore agreement are not at all satisfied with the obligations it has imposed upon them and are sustaining losses because of the high wages they have to pay. The meeting was held to adjust local differences growing out of the agreement. There was no official statement following the meeting but it became apparent that there was dissatisfaction among both operators and miners over the present working agreement.

The miners charge that the provisions of the new agreement are not being observed in all instances, alleging that local working conditions are not conducive to pleasant work and that extra pay for working in wet places is not being allowed.

The operators on their side contend that they are losing money on every ton of coal they mine and ship and that they will lose less money by suspending operations at their plants.

Representing the operators at the joint board meeting were Samuel Pursglove, R. M. Davis, Stephen Arkwright and W. R. Mitchell, the miners being represented by Van A. Bittner, J. K. Studdard, C. F. Davis and John X. Cochran.

Some operators have pointed out that more non-union coal is being mined in the Monongalia field than is coming from union mines and therefore they have asked the union to agree to a reduction in the scale so as to permit union mines to compete with the non-union mines.

"In the event of a failure to adjust the scale," one operator has declared, "we will be forced to close our mines or go to the non-union ranks."

## Trade-Data Ruling Unlikely Before Election

The difficulty of explaining a policy on a controverted question may preclude the Department of Justice from making any announcement on trade-association statistics before the election. Any pronouncement which might be made at this time on that subject, in the opinion of politicians, would be capitalized by the opposition during the campaign. Regardless of the attitude the department might assume, it would be difficult for it to justify its position in the short time intervening before the election, the politicians think. While no comment on the matter is forthcoming at the department, it is the opinion in other well-advised quarters that nothing will be done until after the election.

There is reason to believe that the new Attorney General is in thorough sympathy with removing any uncertainty that may surround trade-association activities. He is thought to realize, however, that it is difficult to know just how a line can be drawn which would clarify the matter. It is certain that there is no disposition to allow the study now being made of the general subject to interfere in any way with the prosecution of those who are using the trade association as a cloak to defeat the purpose of the anti-trust statutes. On the other hand, there is reason to believe that trade associations that are engaged in those activities which are generally recognized as being legitimate are in no danger of prosecution.

## Output of French Coal Mines Gains Steadily

Coal output from the French mines during April totaled 3,640,797 tons for 25 working days, which compares favorably with the March extraction of 3,772,734 tons for 26 working days, according to advices received by the Bankers Trust Co. of New York from its French Information Service.

The average daily output has constantly increased since the Armistice, comparative figures being:

	Average Daily Extraction
Year 1913 .....	136,147 tons
Year 1923 .....	121,064 tons
January, 1924 .....	144,680 tons
April, 1924 .....	145,632 tons

The average daily output from the mines situated within the pre-war frontiers of France is now only 7,155 tons less than in 1913, while the Lorraine mines are producing 16,640 tons a day more than in 1913.

Fuel imports into France during May were as follows: Coal, 2,594,882 tons; coke, 521,888 tons; patent fuel, 77,099 tons. The figures for April were 2,228,024 tons of coal, 703,446 tons of coke and 54,205 tons of patent fuel. May exports included 247,192 tons of coal, 34,434 tons of coke and 11,720 tons of patent fuel, compared with 178,781 tons of coal, 49,711 tons of coke and 8,157 tons of patent fuel in April.



## I. C. C. Issues Warning Of Car Shortage If Coal Movement Is Long Delayed

The Interstate Commerce Commission urges increased production and purchase of coal in a warning against a car shortage in the autumn, issued July 19. The fall months are usually the peak months of transportation, the commission said, and if the carriers are called upon to handle an enormous coal traffic during those months in addition to the other commodities which they are called upon to transport, their facilities will be taxed to the utmost, the commission declared.

The necessity for increasing coal production prior to the peak movement, in the opinion of the commission, would seem apparent if the public is to avoid transportation difficulties.

In sounding its warning, the commission emphasized the following conditions which may cause a car shortage:

"The average production of bituminous coal per year for the past seven years (exclusive of the strike year 1922) has been approximately 520,000,000 tons. The average production in the last six months of such years was 6.8 per cent greater than the average for the first six months. For the first half of this year production has been about 227,639,000 tons. If in the last half of this year production is 6.8 per cent greater than in the first half, the total for the last six months will be 243,118,000 tons, or an average of 9,500,000 tons weekly for weeks of six working days each. Since April 1, 1924, the bituminous coal produced has been less than 7,500,000 tons per week in each instance.

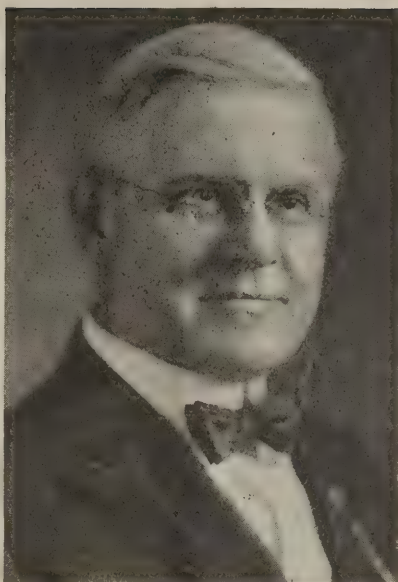
### Emphasizes Danger of Delay

"It can readily be seen, therefore, that if shipments of bituminous coal for winter consumption are deferred for any considerable length of time, the railroads will be called upon to handle a very large quantity of coal during the peak movement in the fall.

"The aggregate of bituminous coal shipped via lake to the Northwest during the 1924 season of Lake navigation to June 30, plus bituminous coal stocks at the head of the lakes April 1 of this year, is 12 per cent less than the corresponding figure for 1923 and 16 per cent less than the corresponding total for 1921, although larger than in 1920 and 1922. However, during the fall months of 1920 and 1922 there were severe car shortages and in the latter year a miners' strike.

"The coal stocks on docks at Duluth, Superior, Ashland and Washburn on June 15, 1924, aggregated 3,125,663 tons as compared with 2,179,999 tons on June 15, 1923, or an increase of 944,664 tons, indicating that considerably less coal has been distributed from the head of the lakes than at this period last year.

"Roads in the Northwest will soon be taxed to their utmost with the heavy demand on transportation in the fall months, during which period we will undoubtedly have a very heavy movement of agricultural products. It is therefore urgently suggested to the people of the Northwest that they pur-



E. J. McVann

Again secretary of the Smokeless Coal Operators' Association, having assumed the duties of the office July 1. Since relinquishing this post several years ago Mr. McVann has represented the smokeless operators in a legal capacity before the Interstate Commerce Commission and other tribunals.

chase their coal early, in order to avoid a curtailment in the transportation necessary for the heavy movement of agricultural products.

"There are no definite records available respecting present coal stocks. The stocks as of Jan. 1, 1924, aggregated 62,000,000 tons. At that time railroad coal stocks totaled 19,367,956 tons, as compared with 15,530,327 tons June 1, which is a decrease of 20 per cent. If the same percentage of decrease is applied to the aggregate coal stocks, the figure as of Jan. 1 would be reduced to 49,600,000 tons; which may not be a fair approximation of the coal stocks as of June 1, 1924.

"It is thought advisable to call the attention of the public at this time to the foregoing situation. The fall months usually are the peak months of transportation, and if the carriers are called upon to handle an enormous coal traffic during those months in addition to the other commodities which they are called upon to transport, their facilities will be taxed to the utmost.

"The necessity for increasing coal production prior to the peak movement would seem apparent if we are to avoid transportation shortages."

## Coal Consumption and Power Output by Utilities Wane

Electric public-utility plants consumed 2,834,266 net tons of coal during May, according to a report by the Geological Survey. This compares with 2,900,864 tons consumed in April, according to the corrected figures. Fuel oil consumed by utility plants in May totaled 1,166,315 barrels, compared with 1,215,111 barrels in April.

The average daily production of electricity by public-utility power plants during May was 154,700,000 kw.-hr., about 2 per cent less than the daily output in April.

## Davis Not To Be Judged By His Legal Service

The legal service of John W. Davis, candidate for President on the Democratic ticket, is no index of his views, according to the New York *Evening Post*. "When one comes to placing a portrait of John W. Davis alongside those of Mr. Coolidge and Senator La Follette to suggest what kind of a man the Democrats have put up for President," says Clinton W. Gilbert in his column, the Daily Mirror of Washington, "one has to wrestle with difficult questions whether he is a conservative or a progressive.

"While the convention was going on I lunched in a Wall Street luncheon club. Everybody there wanted to see him nominated for President. They thought they recognized him as one of their own kind. On the other hand, all the campaign literature describes him as a progressive. Is he a liberal because he once appeared for 'Mother' Jones and Eugene V. Debs in an injunction case and because he recently acted as attorney for a labor union, the National Window Glass Workers? Or is he a conservative because he is counsel for J. P. Morgan & Co. and for a telephone company?

"Here is the story of the defense of 'Mother' Jones and Debs as told by Colonel J. C. Johnson of Clarksburg:

"Do you see that hill?" he asked. "Well, on top of it, more than twenty-five years ago, John W. Davis saved 'Mother' Jones and Eugene V. Debs from a lynching." Now, the old man was referring to the events that led up to Mr. Davis' first case as a lawyer. It was at a mine strike in 1898 and 1899. 'Mother' Jones, grizzled warrior for the labor cause, and Mr. Debs had come here to lead the union miners. The mine owners obtained an injunction against the strikers, and when Mr. Debs and the venerable woman refused to abide by it they were surrounded out on 'T. K.' hill by angry townspeople and non-union miners. They were in the midst of a dangerous swarm. The angry mass moved forward apparently to wreak summary treatment. It was at this juncture that Mr. Davis, recently out of Washington and Lee University and flushed with his first undertaking, mounted a shabby wagon and delivered an impassioned plea. He denounced the injunction as high-handed and against all the institutions of this country and pleaded that reason take the place of mob spirit. He was successful in getting the endangered strike leaders to safety, and subsequently went into court and defended them. He won. It was his first legal victory.

"It is only fair to brush aside all of Mr. Davis' legal employment in trying to make up our minds what his views are. He isn't a progressive because he has appeared for 'Mother' Jones nor a conservative because he has appeared for Mr. Morgan. He is only a lawyer taking cases as they come to him. He defines his own attitude thus: 'I conceive it to be the duty of a lawyer, just as it is the duty of a priest or surgeon, to serve those who call on him, unless, indeed, there is some insuperable obstacle in the way.'"



## Ohio Miners and Operators Agree to Modify Scale

An agreement was signed at Logan, Ohio, July 18 by the joint conference of operators and miners in the southern Ohio field which virtually puts into effect the agreement in the No. 8 field of eastern Ohio. The joint conference held sessions for about ten days and every important point in the scale and working conditions was gone over thoroughly. The operators asked for a number of concessions, which were granted, and as a result it is hoped that production in the southern Ohio field will be stimulated when market conditions improve. Dead work and the removal of slate will not be so expensive and the cost of producing coal will be lowered as a result. Another provision imposes heavier penalties for the loading of dirty coal and it is proposed to enforce them.

## Corbin Amalgam Plant Nearly Ready

The Corbin Coals, Ltd., formerly the Corbin Coal & Coke Co., is installing at Spokane, Wash., an amalgam plant costing about \$100,000, to prepare the smaller sizes of coal. This is a new method of treatment the product of which is said to be a fuel that is exceedingly popular with the consumer, among its virtues being almost total freedom from smoke and ash. The plant is reported to be almost ready for operation. A coal washery is being placed at Corbin to clean coal larger than  $\frac{1}{2}$  in. in size and will be ready soon.

The Corbin coal lies in huge vertical seams or lenses and some 10 or 12 of these have been found on the company's property. The Mammoth Mine, which is developed to the point of producing about 250 tons a day, is opened up on a lens 450 ft. thick. The depth so far proved is 300 ft., with every evidence that it continues several hundred feet deeper. The seam has been traced over the mountainside for about a mile. Owing to the peculiarity of the formations the coal varies in grade and quality. In places it is of the nature of anthracite and in other places soft and easily broken. A number of small bands of shale make it difficult to clean and have led to the introduction by the company of the modern plant.

## Museum of Engineering And Industry Asks for Nine Million Dollars

One million dollars has been assured toward the establishment of the National Museum of Engineering and Industry, Inc., with headquarters in the Engineering Societies Building, New York City. A campaign to raise an additional \$9,000,000 started July 5. The president of the new organization is Dr. Elihu Thomson, who received the Kelvin Gold Medal from the Royal Society at the Kelvin centenary in London on that same day. The vice-presidents are Dr. Edward G. Acheson, one of the creators of the modern abrasive industry; Dr. Leo H. Baekeland, inventor of Velox paper and Bakelite, who is president of the American Chemical Society, and Dr. Edward Weston, creator of the Weston type of electrical instruments.

In co-operation with the Smithsonian Institution the new organization is planning to erect on its grounds in Washington a building to house the original models of early inventions and the records of constructive achievement of pioneers, inventors and engineers in the development of transportation and industry. In this way the United States will be given the kind of institution which all the great European nations have possessed for years, and in the layout of the proposed museum use will be made of the data collected by an expert who has recently returned from a year's survey of museum practice abroad.

### To Make Special Collections

An important departure in the American scheme is proposed, however; made necessary by the vastness of the country. In addition to the central collection at Washington special collections such as replicas of the historical exhibits will be carried to the people, also live machinery of modern processes will be placed in affiliated museums in industrial centers of every state.

Already old models and records long forgotten have been located and resurrected and this winter will be exhibited at the headquarters as a demonstration of how the ultimate collection will appear.

## Illinois Rate Boost Deferred; May Reopen Whole Case

New Northwest rates raising Illinois coal 28c. to the Twin Cities will take effect Sept. 10 instead of Aug. 21, according to the latest decision of the Interstate Commerce Commission, announced to Western carriers July 21. This puts one more kink into the tangled skein of Northwest coal rates. The new schedules were postponed to give railroads time to publish them. Incidentally it gives time for one more petition to the commission to reopen the whole Northwest rate case.

Illinois coal operators are the latest to file, following in the wake of six other protesting groups. Illinois claims there is no justification for advancing that state, that the commission erred in its findings of undue discrimination, that the commission erred in not taking the whole origin territory into consideration, that the 'order compels violation of the fourth section of the Transportation Act by failing to find illegality in existing rates to the Twin Cities, at the same time ordering increases to intermediate points. Illinois also claims the I. C. C. examiner excluded proper testimony that justifies reopening the case.

## Cutting-Machine Runners Strike at Orient Mine

The new machine-loading scale signed July 15 by the miners' union and the Chicago, Wilmington & Franklin Coal Co., Chicago, produced a strike at the mine. On the morning of the 16th, when the scale took effect, all the cutting-machine runners at the Orient No. 2 mine declined to go below. They could not make a satisfactory agreement with the mine superintendent for their tonnage payments. The new agreement signed by union officials provided that until the company gets weighing equipment installed, the cutting machine men's pay would be fixed by agreement. The company refused to discuss the case until the men went back to work under the general working agreement. This they had not done up to Saturday, so the mine stood idle.

## Reeves Dock at Superior To Be Rebuilt at Once

Announcement has been made of the plans of the reconstruction of the Reeves dock at Duluth-Superior, Wis., which was reported under demolition several weeks ago. The Reeves Coal & Dock Co. has been formed under the laws of the State of Delaware, and will construct a 500,000-ton dock on the present site as soon as plans are finished. The dock will cost \$750,000. Plans are being drawn by the Fegles Engineering Co. Contracts will be let as soon as these plans are completed. The dock property is located on the highway between Duluth and Superior and is considered the best dock property in the harbor.

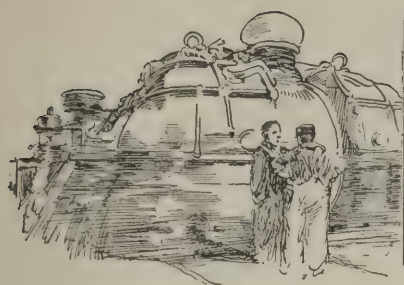
The Reeves company has announced a "coal-at-cost" policy, which will mean that 500 dealers throughout the Northwest will save 25c. a ton.



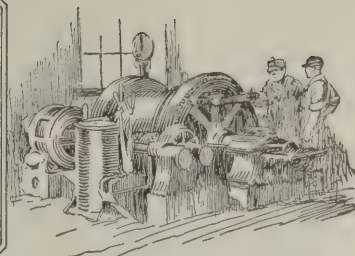
Forestation by Clearfield Bituminous Coal Corporation, of Clearfield, Pa.

Thirty-eight coal companies set out more forest trees than any other group of tree planters in Pennsylvania during 1923. The Clearfield corporation was the leader, planting 163,000 trees. Of the corporation's 150,000 acres of coal holdings, 24,000 are owned in fee and available for reforestation.





## Practical Pointers For Electrical And Mechanical Men



### Various Forms of Gears and Their Uses

Spur Gears with Shafts Parallel—Bevel Gears with Shafts at Angles but in One Plane—Worm Gears with Shafts at Right Angles but in Different Planes

BY GUSTAV H. RADEBAUGH  
Urbana, Ill.

**T**HE gears used on mine machinery are made from wrought steel, cast iron, bronze, brass, malleable iron, rawhide, fiber and steel castings. In general practice, malleable iron gears are made by casting the metal in molds of appropriate shape. Sometimes steel gears are made in the same way. Cast iron is used both for cast and machine-cut gears. The gears made from mild, tool and alloyed steels, bronze, and brass generally carry machine-cut teeth.

Gear cutting is an extremely delicate job, requiring special machines which are designed to space the teeth properly and give them the required contour. This is why machine-cut gears cost so much more than cast gears and are of superior quality. The teeth on the cast gear are not formed by a machine, but are merely cast in the sand and consequently do not have as perfect a shape as those which are machine-cut.

#### CUT GEARS FOR TRANSMISSION

Cast gears are used extensively on certain kinds of mine machinery, and they serve their purpose admirably. For power transmission the cut gear is generally used. Several styles of gears are used for transmitting power. When using gears, power is transmitted without slippage or lost motion so long as the teeth retain their shape.

The most familiar gear is that having spur, or radial, teeth. The small gear, shown in Fig. 8 meshing with the spur gear, Fig. 9, is called the pinion. This type of gear can be machine-cut or cast. The sizes of the gears are determined by the size of the teeth. The most common sizes are the 16, 12, 10, 8, 6 and 4 pitch. By a No. 4 pitch gear is meant one having four teeth for every inch of its diameter—hence, the pitch is equal to the number of teeth per inch of diameter. For example, if a gear has 60 teeth and the diameter of the pitch circle is 10 in. its diametral pitch is 60/10 or 6, and the gear is therefore called one of No. 6 pitch.

It is not difficult actually to determine the pitch of a gear, but if in doubt as to the procedure, and it is necessary to secure this information for a replacement order, a simple plan is to mark out the shape of six or eight teeth on a piece of paper and with this

drawing give the number of teeth and the outside diameter. It is then a simple matter for the supply house to figure the correct pitch of the gear. In order to obtain a gear of the proper dimensions to fit the requirements, the bore of the hole, the size of the key seat and the width, length and diameter of the hub should be given also. The spur gear, as can be seen from Figs. 8 and 9, is used for transmitting power from one shaft to another parallel to it.

Bevel gears, Fig. 13, which may be either cut or cast, are designed to transmit power to shafts which are not parallel but lie at some angle to each other in the same plane. They may be arranged to work at any one of many given angles. Bevel gears and bevel pinions are shown in cross section in Figs. 14, 15 and 20. The pair in Fig. 14 has the two shafts at an angle less than 90 deg. The one below has an angle greater than a right angle. In the lower left hand corner of the illustration the angle is still greater, and the larger wheel is known as an inside bevel gear. These three drawings illustrate the wide range of usefulness of this device for transmitting power through various angles.

#### RAWHIDE GEAR ALMOST SILENT

The miter gear, Fig. 18, is a bevel gear in which the shafts are at right angles, the gears have the same number of teeth and the pitch or contact cones are of the same size. Rawhide gears, Fig. 16, are used to advantage on high-speed work. One member of a pair or train of the spur and bevel gears are often made from rawhide, fiber or some similar material. One reason for using gears of this kind is that they run almost noiselessly. The rawhide is supported on each side with steel or brass plates held in position by rivets passing through the gear body.

Racks, Fig. 19, are used frequently on mine machinery. The size of the rack is determined as in the spur gear. One of the most common difficulties with the rack, especially those made from cast iron, is the fact that they are liable to break in two. Ordinarily this is caused by not having the rack firmly and evenly fastened in position. Severe stresses are also placed on the rack when quantities of dirt and grit

are allowed to collect between the teeth.

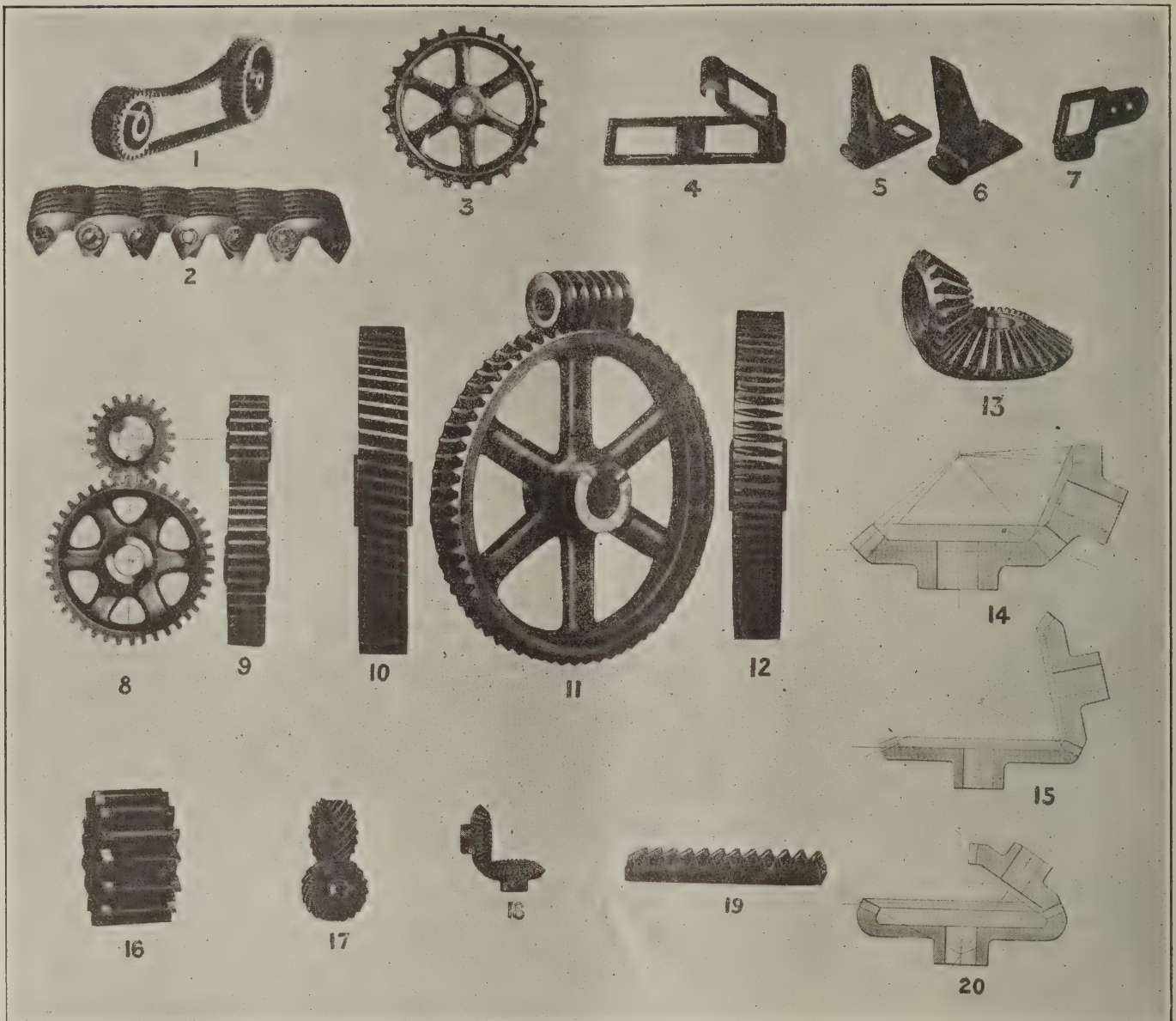
The worm and worm wheel, as shown in Fig. 11, are a combination of a screw and a gear and are used for transmitting motions from one shaft to another at right angles to it, the shafts not being in the same plane. This type of gearing is used when it is desired to change small torque at high speed to high torque at low speed. The most common use of the worm and worm wheel is in steering gear construction and small electric motor drives. The worm, as a reference to Fig. 11 will show, is simply a screw whose threads fit the teeth of the worm wheel. The worm wheel may be a plain spur gear with the teeth cut at an angle or curved to fit the worm. These wheels are of two types, the hobbed-work wheel Fig. 10 or the gashed-tooth worm wheel, Fig. 12. The shapes of these wheels are clearly defined in the plate.

#### MUST KEEP CHAIN GRIT FREE

The link belt or silent chain as shown in Figs. 1-7, is used on drives in the power plant of the truck, gasoline locomotive and automobile. To get the best service from this type of drive it is essential that the chain be kept properly lubricated and free from grit and dirt. When a chain becomes stiff and dirty from the accumulation of foreign material, free it from the drive by removing a pin and bushing. Then clean it well in a bath of gasoline. Cleaning the chain in a hot bath of water and salsoda is also considered good practice. After the chain is thoroughly cleaned, using either method, it then should be immersed in a good quality of hot lubricating oil and permitted to soak in this hot bath for a half hour.

The sprocket wheel is usually made from cast iron, although some of the small sizes are made from malleable iron. If these sprocket wheels break and it is impossible to get a replacement from the factory when needed, the broken wheel can be used as a pattern from which a new wheel may be cast at a near-by foundry. When fitting a new sprocket wheel on a job always test the wheel with the chain. This is done by testing the fit of the chain around the entire circumference of the sprocket wheel. Remember the chain is the standard and that the wheel must be fitted to it. Some of the chains used on sprocket wheels wear out quickly and when this happens the shape of the chain is possibly at fault and not the material. Inspect the sprocket wheel, and a large or uneven tooth may be discovered which is causing the damage.





Some of the Gears and Link Equipment Used for Transmission of Power

Figs. 1 and 2—Silent link chains; Fig. 3—Sprocket wheel; Fig. 4—Ewart link belt; Figs. 5, 6 and 7—Attachments used with Ewart link belts for conveying purposes; Figs. 8 and 9—Two views of spur gearing; Fig. 10—Helical gear; Figs. 11 and 12—Worm and worm wheels. The thread of the worm is left-handed. On the left hand is a hobbed-work wheel and on the right

hand a wheel with gashed tooth; Fig. 13—Bevel gear; Fig. 14—Bevel gear with angle of axes less than 90 deg.; Fig. 15—Bevel gear with angle of axes more than 90 deg.; Fig. 16—Rawhide pinion; Fig. 17—Spiral gear; Fig. 18—Miter gear; both gears same size and angle between them a right angle; Fig. 19—Steel rack; Fig. 20—Inside bevel gear and pinion.

A large number of special attachment links for sprocket chains are made. These are most commonly used to hold conveyor flights and the like. Three of these links are shown in the plate. In this type of chain the links are made from malleable iron. Chains,

after they have been in service for a long time become loose in the joints, causing the chain to unhook. This may be overcome by closing the hooks at the ends of the links so that they will fit the bar of the adjacent link more closely.

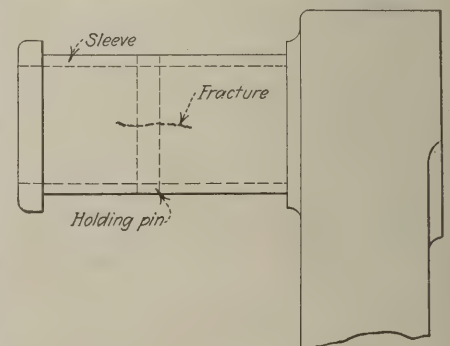
### Repair of a Steam Engine Crankpin

The crankpin on a 200-kw. engine-driven generating unit had been heating and giving much trouble for quite some time. Often it had been necessary for the engineer to spend nearly all of his time oiling the bearing and in many other ways taking care of the crankpin. A thorough investigation revealed nothing wrong with the pin; it was in the proper alignment and of proper diameter.

The mechanical engineer of the plant finally ordered a new pin, but the attendant was not entirely satisfied that

a new one was needed and therefore made a close examination and found a small crack from which the oil would run out when he clamped the sides of the pin together. The crack was so thin that it was almost impossible to see it with the naked eye. It was large enough, however, to explain the difficulty. The pin while running would expand and cause the fracture to open up and bind in the bearing box, cutting the box out. As shown in the illustration a thin bushing in the shape of a sleeve was shrunk on the crankpin and a hole drilled through the crankpin and bushing to accommodate a pin for holding the sleeve in position. After

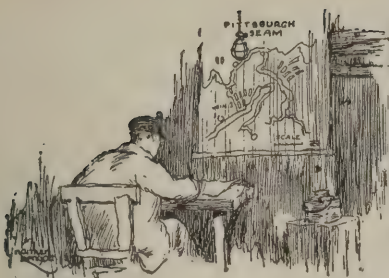
the ends of this pin had been filed down the crankpin was again put in place and no further difficulty experienced.



### Quick Repair to Crankpin

A sleeve was pressed over the whole surface of the crankpin and a pin driven through to hold it in position. In this way the crankpin was given a new smooth surface and heating of the bearings permanently stopped.





## Problems In Underground Management



### Rock-Dusting Machine with Three Fixed Outlets Treats Roof and Ribs

Is Mounted on a Single Truck and Does Not Need Services of a Nozzleman  
— Dust Does Not Pass Through Fan

NOW that the coal-mining industry is convinced of the utility of rock-dusting as a safety measure the chief problem confronting the coal producers is that of finding the best method or machine wherewith to apply the dust. Various portable blowers are now in process of construction. Among them is the Miller mine-dusting machine designed by James B. Miller of St. Louis, Mo., and shown in the accompanying illustrations. The first of these machines has just been put to work experimentally in the mine of the Valier Coal Co., Valier, Ill., near the properties of the Old Ben Coal Corporation

bottom of which extends a screw conveyor transporting dust to one end and delivering it at a point directly beneath a multiple outlet through which a fan is driving a blast of air. The dust is picked up by this current and is discharged through three rectangular outlets, two of which are directed toward the ribs at a slight elevation above the horizontal while the third is aimed directly at the roof. None of the dust passes through the fan itself. The dust is drawn from the conveyor pipe beneath the fan and swept upward through the outlets, the inlet apertures being below the fan casing.

The fan is 12 in. long and revolves in a drum housing of light sheet steel. The three discharge pipes, all the air and dust inlets of which are at the bottom of the drum, curve upward and around the circumference of the casing delivering the dust streams at three angles so as to effect complete coverage of ribs and roof. The traveling speed of the truck can be varied somewhat without changing the volume of dust delivered per lineal foot of entry. This is done by altering the speed of the motor which drives the screw conveyor. This change of speed modifies the quantity of dust drawn from the bin, the speed of the totally-inclosed dust-proof motor driving the fan being similarly changed.

After much experimentation Mr. Miller determined upon what he thinks is a proper ratio of dust delivery as between outlets. This is partly governed by the sizes of the discharge pipes. The cross section of the two outlets delivering dust to the ribs is in each case 5x8 in., the perpendicular pipe directed at the roof being only 2 in. wide. Were there no other controlling factor, the sizes of the pipes thus would divide the dust discharge so that five parts would strike each wall and two parts would be distributed on the roof.

But there is a further control of this proportion. It is effected by the adjustment of sleeves fitted around the feed pipe by means of which the screw delivers dust to the fan. The feed pipe bears a wide slot along its top for the full 12 in. under the fan chamber. This aperture can be widened or narrowed under each discharge pipe by revolving the sleeve of that section of the

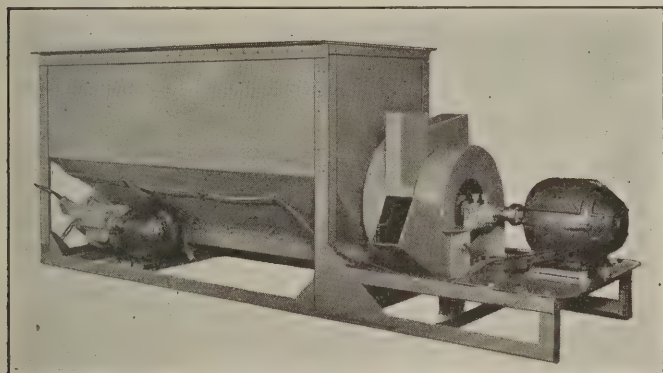


FIG. 1  
Side View of  
Rock-Dusting  
Machine

This shows both motors, one totally inclosed driving the fan with its three outlets and the other driving the dust conveyor through back gearing and chain. Note that both dust bin and fan casing are of welded construction.

where much of the work of adapting rock-dusting to the mines of this country was done by J. E. Jones, safety engineer for Old Ben.

The Miller duster was designed after Mr. Miller had spent several weeks in the Old Ben mines studying the dusting problem in company with various engineers. It differs in two main particulars from most of the other dusting machines now in the development stages. In the first place this machine in its entirety is mounted on one truck instead of having the dust bin on one truck and the nozzle on another. The other main difference between it and other machines designed for a similar purpose is the fact that the dust is discharged through three fixed outlets instead of through one flexible pipe. This reduces the crew necessary for the operation of the machine by one man as no nozzle has to be manipulated.

The Miller duster may be briefly described as follows: The machine consists of a bin of three tons capacity along the

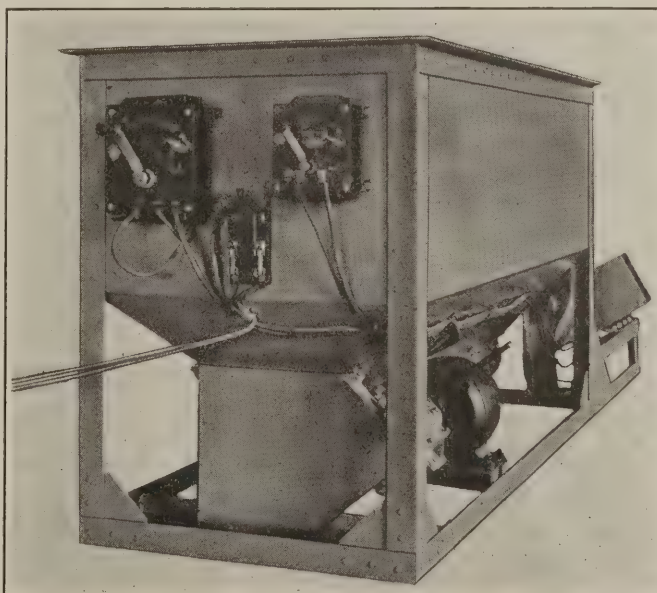


FIG. 2  
End View Showing  
Electrical  
Control

It is, of course, intended to mount the entire mechanism shown in this illustration on a truck that may be pushed or pulled through the mine headings by a locomotive. One operator controls the entire machine and has practically nothing to do while it is in operation.



feed pipe. By a nicety of sleeve adjustment, the same volume of dust can be discharged from each outlet, or the proportions blown against the top and the two ribs can be changed to suit the needs of the place to be dusted.

One or two engineers, upon seeing the drawings and photographs of this machine for the first time, have wondered whether the three dust-laden air

streams from the machine might not set up conflicting air currents and eddies in certain parts of the cross section of an entry that would prevent dust from reaching the angles between roof and ribs. This possibility was, however, considered in building the machine and the difficulty obviated by properly adjusting the force of the air blast.

## Why Exhaust Only Tenth of One per Cent Of Your Mine Development Daily?

**Takes Five Years to Extract One Hundred Acres—Should Follow Automobile Industry in Planning Rapid Sequence of Operations—Ventilation Problems Vexatious in V-System of Mining**

AT THE bi-monthly meeting of the mining section of the Engineers' Society of Western Pennsylvania, evening of June 24, 1924, in Pittsburgh, E. B. Moore, who is Pittsburgh manager of the Coal Service Corporation, talked on "Concentration in Coal Mining." F. A. McDonald, general superintendent of the National Mining Co., presided.

In room-and-pillar mining, according to Mr. Moore, the average output per place worked is less than 10 tons. A mine with a capacity of 1,000 tons of coal per day, therefore, requires about 150 working places, allowing for idleness of 50 per cent of the places, which is generally a safe assumption. These places are quite likely to be scattered over an area of 100 acres, from which, in a thick seam, only about one-tenth of an acre is actually extracted per day to yield 1,000 tons. The ratio of the area extracted per day to the area developed is as 1 is to 1,000. It would take about five years to work out the developed area at this rate of mining by the use of the present methods.

### NEW MEANS AND NEW WAYS

Two ways to mine coal intensively are at the disposal of every operator, (1) by the use of new and modern equipment, (2) by resorting to some modification of longwall or room-and-pillar mining. The ideal system involves a combination of the two. In the mines where the room-and-pillar method is the only choice, mechanical equipment will serve to lower production costs. The day may come when three or four cuts will be taken per day from each working place. A prominent mining engineer proposes to do that very thing, by stationing three hand loaders in each of two adjoining rooms which are to be cut alternately and the coal loaded onto conveyors. "Many operators say such intensive mining can't be done profitably," remarked Mr. Moore. He is confident that it can by giving due regard to mine layout and by close supervision.

In his optimism he contrasted present mining methods with the modern production methods employed in automobile factories, where a thousand and one operations are performed successively with little loss of time. He sees no reason why mining cannot be speeded up by the elimination of lost

time between the half dozen operations performed at the face.

In a few years, he is disposed to believe, the fuel requirements of this country will be met mostly by mine owners who take advantage of labor-saving equipment to reduce the cost of production. A company now using modern equipment and a concentrated system of mining reports a saving of 30 to 35 per cent over the cost of producing coal by the room-and-pillar method.

Roof control is the chief factor standing in the way of mining extensively by concentrated systems in which longwall mining is involved. Heretofore not enough attention has been given to the potentialities of long faces, which, where they can be worked successfully, lower the costs of driving headings, laying track, drainage, ventilation, etc.

### HAS INDUSTRY BEEN ASLEEP?

Mr. McDonald denied Mr. Moore's statement that the reason why the mining of coal is far behind the times is because of the failure of those engaged in this pursuit to adopt labor-saving machinery, and questioned whether more intensive mining and closer supervision alone would effect savings in the cost of production. He said the labor situation in the Pittsburgh district made such advances difficult, though some progress is shown in nearby non-union districts. Different conditions in every field, mine and section of a mine prohibit the adoption of any one general method for all mining.

An objection was raised by R. H. Scheller to the concentration of working places. He maintained that the chemical content of coal varies from place to place in a mine. Coal extracted from a large area, when mixed in dumping, is fairly uniform in composition from day to day, or month to month. Uniformity of ash, sulphur, phosphorus, etc., is highly desirable in coking coal for metallurgical use. His objection had no reference to steam coals.

R. W. Powelton wanted to know if mechanical loaders are being used anywhere in a concentrated system of mining, if longwall mining is being practiced at any mine in the vicinity of Pittsburgh and what percentage of recovery may be expected from concentrated mining. Mr. Moore replied

that a mine in Indiana is using Joy loaders together with the Movor conveyor in a concentrated system. The H. C. Frick Coke Co. is working the Pittsburgh seam on a longwall face at its Leckrone mine. Recovery from concentrated mine layouts should be higher than that obtained from rooms and pillars. The chief engineer of the West Virginia Coal & Coke Co. claims a recovery better than 95 per cent from the V-system of mining.

Graham Bright characterized E. C. Moore as being modest in not saying much about the V-system of mining which his firm advocates. During a visit in the Norton mine where this system is being worked, Mr. Bright noticed that the men were actively engaged in useful work practically at all times. Concentration permits factory-like illumination at the working face, eliminates many of the dangers prevalent in scattered workings and invites close supervision. He thinks that wherever the coal is clean loading machines of some type now in use can be used in conjunction with the Movor conveyor in the V-system of mining.

### VENTILATING THE V-SYSTEM

"How would the V-system work in a gaseous mine?" asked T. G. Fear, general manager of the Inland Collieries Co. He is not convinced that the system is safe when used in gaseous mines. A roof break might encroach on the points obstructing the path of the current of air with which the faces must be swept. Mr. Moore advocates the use of blowers or a brattice-cloth wall up the center of a gallery for ventilation purposes. Mr. Fear said that the practice of thus using brattice cloth is unsafe. The driving of two gallery entries to each pair of faces would provide better ventilation but would at the same time occasion other difficulties. Flame-proof motors undoubtedly will be furnished with the Movor conveyor wherever the conveyor is to be installed in gaseous mines, said Mr. Moore.

### Freakish Coals in Scotland

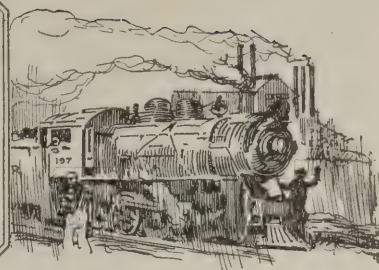
In a paper on "The Heat Due to Strata Movements and Its Effect on Certain Coal Seams," read before the North of England Institute of Mining and Mechanical Engineers, Newcastle-upon-Tyne, England, by Henry Briggs, A. L. S. Owen and John Wilson, reference is made to the earliest account of what has been known as "calcareous coal" because of the presence of large quantities of calcium, magnesium and ferrous carbonates, the first forming about one-third of the altered coal and the two others together another 12 to 20 per cent of its weight. This coal is found south of Motherwell, Lanarkshire, Scotland, between that town and the Clyde.

The alteration varies in extent from point to point in the 100 acres affected. It affects several seams but in an erratic manner, but it does not appear to extend deeper than 300 ft. Apparently the occurrence has relation to heat and to certain faults, of which the three principal ones converge at low angles and finally join.





# Production And the Market



## First Signs of Awakening Interest Come to Light In Bituminous-Coal Trade

A faint but none the less unmistakable awakening of activity in the Southwest is the first favorable tangible development in the soft-coal trade since the present depression set in. The increase, which is not large, is not so important in itself but is of far reaching interest as a possible portent. For some time the feeling has been strong that the beginning of a revival was at hand, but politics and various other reasons have been advanced as responsible for the delay in its appearance. Meanwhile the country's stockpiles continue to shrink to the danger point, though at a less rapid rate than many imagine, because of the slowdown in all lines of industry. Shipments by lake to the Northwest, too, are far below the seasonal average at this time. Reports of the reopening of textile plants continue to filter in, but these are offset by reduced working time at a number of others. Concurrently the trade continues to mark time as the process of readjustment develops, prices and production showing slight material change.

### Commerce Commission Warns Against Delay

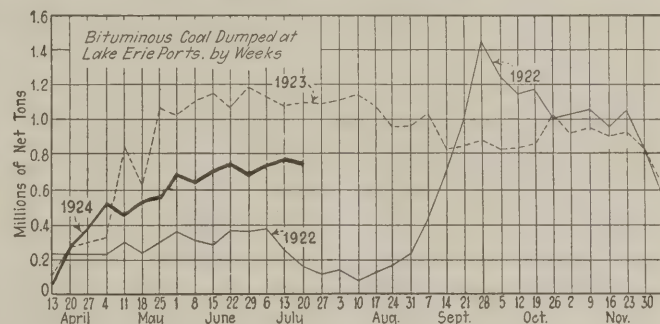
Calling attention to the danger of transportation difficulties in the event of heavy traffic on the railroads in the autumn, the Interstate Commerce Commission issued a warning last week that coal purchases should be no longer delayed. Another interesting development was an agreement by miners and operators in the southern Ohio field modifying working conditions in such a manner as to enable mines in that district to compete more successfully with the non-union fields.

Coal Age Index of spot prices of bituminous coal advanced slightly during the last week, standing on July 21 at 163, the corresponding price for which is \$1.98.

There was a marked quickening in activity at Hampton Roads after the holiday, dumpings of coal for all accounts during the week ended July 17 totaling 373,600 net tons, a gain of 137,080 tons over the pre-

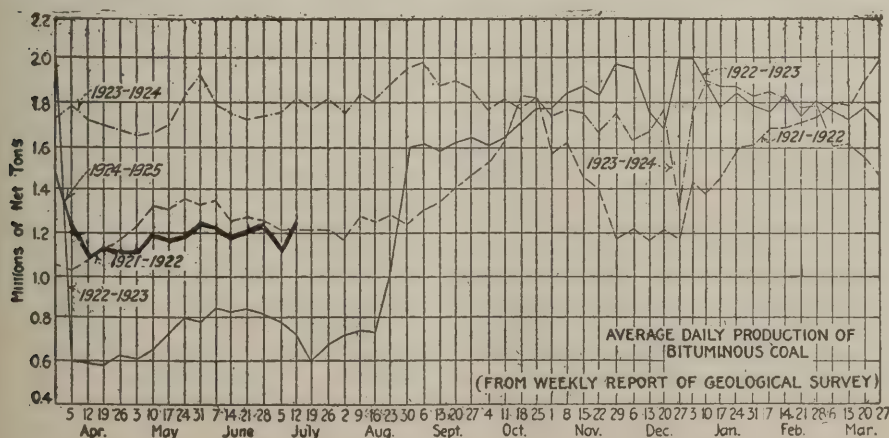
ceding week, when 236,520 net tons was dumped. Coal dumped at Lake Erie ports during the week ended July 20, according to the Ore & Coal Exchange, was as follows: Cargo, 733,634 net tons; fuel, 41,667 tons. The totals for the previous week were 731,438 net tons of cargo coal and 48,062 tons of fuel coal.

Production of bituminous coal recovered sharply from the slump caused by the holiday, output during the week ended July 12, according to the Geological Survey, totaling 7,455,000 net tons, which is the highest level attained since the week ended March 29. Anthracite output likewise registered a rebound to 1,871,000



net tons during the week ended July 12, compared with 1,296,000 for the preceding week.

Demand is far from brisk in the anthracite market, though the larger companies do not find it difficult to move domestic sizes other than pea, which is piling up on both companies and independents. Independent prices are weak, stove when taken alone bringing about 25c. more than when sold with another size. Egg also in some instances commands a little higher price than chestnut, being not quite so superabundant. Steam sizes are sluggish in the extreme, only the better grades of independent product being able to command anything like company schedules.



### Estimates of Production

(Net Tons)

#### BITUMINOUS

	1923	1924
June 28.....	10,458,000	7,371,000
July 5 (a).....	8,742,000	5,738,000
July 12 (b).....	10,925,000	7,455,000
Daily average.....	1,821,000	1,243,000
Cal. yr. to date (c).....	290,478,000	239,409,000
Daily average to date.....	1,772,000	1,461,000

#### ANTHRACITE

June 28.....	2,105,000	1,918,000
July 5.....	1,580,000	1,296,000
July 12.....	2,051,000	1,871,000
Cal. yr. to date.....	54,800,000	48,792,000

#### COKE

July 5 (a).....	376,000	94,000
July 12 (b).....	366,000	105,000
Cal. yr. to date (c).....	10,744,000	6,282,000

(a) Revised from last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.



### Midwest Gains a Little Confidence

A slight indication of the pick-up to come in domestic coal has been felt in the Middle Western states during the past week. Country orders from dealers for certain prepared sizes have begun to trickle in slowly. This does not awaken the dealer trade in the cities, however, so there is little enough as yet to bolster up the flat condition of the market. Illinois operators are letting it be known that they intend hoisting the price of lump and egg 15 or 25c. Aug. 1. The general lifelessness of things has shut down three or four mines that have been trying to operate, and a couple of operators who had announced their intention of opening up July 15 changed their minds. Steam coal is draggy although many stocks are getting down toward the vanishing point.

Field conditions in Illinois continue discouraging. The railroads are about the only consumers that are taking anything from commercial mines and these shipments are not enough to provide much running time. More than half of southern Illinois continues shut down cold. The Jackson County and DuQuoin field is in even worse condition. Mt. Olive production is almost at a standstill, except at railroad mines, and the Standard district is absolutely flat.

Business conditions at St. Louis are quiet. There are few domestic orders although this trade is beginning to pick up in spots. Local wagonload steam has practically ceased and carload steam is so easy that it can hardly be found. Country steam also is hard to find, but here and there in the country there are indications that buying ought to be pretty good by Aug. 1, as there is some activity now to indicate that.

### Kentucky Feels Better

At least a few of the Louisville coal men have obtained some business over the week, and are feeling better. There have been some good state contracts placed, 646 cars of screening selling at from \$1.10 to \$1.25 a ton, and while these prices are low—around 75c. a ton under prices of last year—it has lent some encouragement.

It is also said that domestic consumers are stocking more freely and that retailers are buying more coal, including some yard stock. General industrial business is in small lots, and the utility, steel and other big consuming interests are not buying in sufficiently large quantities to make things interesting, according to coal men. Nevertheless, the market is being well maintained on screenings, in spite of fairly large production of prepared coal in eastern Kentucky.

### Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern		Market Quoted	July 23 1923	July 7 1924	July 14 1924	July 21 1924	Midwest		Market Quoted	July 23 1923	July 7 1924	July 14 1924	July 21 1924
Smokeless lump.....	Columbus....		\$6.00	\$3.85	\$3.85	\$3.75@ \$4.00	Franklin, Ill. lump.....	Chicago.....	\$3.65	\$2.75	\$2.75	\$2.75@ \$3.00	
Smokeless mine run.....	Columbus....		3.25	2.20	2.20	2.10@ 2.35	Franklin, Ill. mine run.....	Chicago.....	3.00	2.35	2.35	2.25@ 2.50	
Smokeless screenings.....	Columbus....		2.90	1.30	1.30	1.10@ 1.50	Franklin, Ill. screenings....	Chicago.....	1.65	1.70	1.70	1.60@ 1.80	
Smokeless lump.....	Chicago.....		6.10	3.60	3.60	3.75@ 4.00	Central, Ill. lump.....	Chicago.....	2.60	2.35	2.35	2.50	
Smokeless mine run.....	Chicago.....		3.60	1.85	1.85	1.75@ 2.00	Central, Ill. mine run.....	Chicago.....	2.10	2.10	2.10	2.00@ 2.25	
Smokeless lump.....	Cincinnati.....		6.00	3.85	3.75	3.50@ 4.00	Central, Ill. screenings.....	Chicago.....	1.45	1.65	1.65	1.60@ 1.65	
Smokeless mine run.....	Cincinnati.....		3.35	1.80	1.80	1.65@ 2.00	Ind. 4th Vein lump.....	Chicago.....	3.35	2.60	2.60	2.50@ 2.75	
Smokeless screenings.....	Cincinnati.....		3.00	1.10	1.35	1.25@ 1.50	Ind. 4th Vein mine run.....	Chicago.....	2.60	2.35	2.35	2.25@ 2.50	
*Smokeless mine run.....	Boston.....		5.60	4.30	4.30	4.25@ 4.40	Ind. 4th Vein screenings.....	Chicago.....	1.60	1.70	1.70	1.60@ 1.80	
Clearfield mine run.....	Boston.....		2.35	1.90	1.80	1.60@ 2.10	Ind. 5th Vein lump.....	Chicago.....	2.85	2.35	2.35	2.25@ 2.50	
Cambria mine run.....	Boston.....		2.85	2.35	2.20	1.85@ 2.50	Ind. 5th Vein mine run.....	Chicago.....	2.10	2.10	2.10	2.00@ 2.25	
Somerset mine run.....	Boston.....		2.60	2.15	1.95	1.75@ 2.25	Ind. 5th Vein screenings.....	Chicago.....	1.45	1.55	1.55	1.50@ 1.65	
Pool 1 (Navy Standard).....	New York.....		3.35	2.70	2.70	2.50@ 2.90	Mt. Olive lump.....	St. Louis.....	3.00	2.85	2.85	2.75@ 3.00	
Pool 1 (Navy Standard).....	Philadelphia.....		3.50	2.80	2.80	2.60@ 3.00	Mt. Olive mine run.....	St. Louis.....	2.00	2.50	2.50	2.50	
Pool 1 (Navy Standard).....	Baltimore.....						Mt. Olive screenings.....	St. Louis.....	1.75	2.00	2.00	2.00	
Pool 9 (Super. Low Vol.).....	New York.....		2.65	2.15	2.10	1.90@ 2.25	Standard lump.....	St. Louis.....	2.55	2.15	2.15	2.00@ 2.35	
Pool 9 (Super. Low Vol.).....	Philadelphia.....		2.65	2.15	2.15	1.95@ 2.35	Standard mine run.....	St. Louis.....	1.85	1.80	1.80	1.75@ 1.85	
Pool 9 (Super. Low Vol.).....	Baltimore.....		2.40	1.85	1.85	1.85@ 2.00	Standard screenings.....	St. Louis.....	.90	1.45	1.45	1.40@ 1.50	
Pool 10 (H.Gr. Low Vol.).....	New York.....		2.25	1.80	1.80	1.65@ 2.00	West Ky. lump.....	Louisville.....	2.15	2.00	2.10	2.00@ 2.25	
Pool 10 (H.Gr. Low Vol.).....	Philadelphia.....		2.25	1.75	1.75	1.65@ 1.90	West Ky. mine run.....	Louisville.....	1.70	1.60	1.60	1.50@ 1.75	
Pool 10 (H.Gr. Low Vol.).....	Baltimore.....		2.20	1.65	1.65	1.65@ 1.75	West Ky. screenings.....	Louisville.....	1.05	1.25	1.25	1.15@ 1.35	
Pool 11 (Low Vol.).....	New York.....		1.95	1.60	1.45	1.35@ 1.75	West Ky. lump.....	Chicago.....	2.10	1.95	2.05	1.90@ 2.25	
Pool 11 (Low Vol.).....	Philadelphia.....		1.85	1.45	1.45	1.35@ 1.60	West Ky. mine run.....	Chicago.....	.95	1.60	1.60	1.50@ 1.75	
Pool 11 (Low Vol.).....	Baltimore.....		1.95	1.55	1.55	1.50@ 1.60							
High-Volatile, Eastern							South and Southwest						
Pool 54-64 (Gas and St.)...	New York.....		1.75	1.50	1.50	1.35@ 1.65	Big Seam lump.....	Birmingham..	3.25	3.20	3.20	3.10@ 3.30	
Pool 54-64 (Gas and St.)...	Philadelphia..		1.70	1.50	1.50	1.40@ 1.60	Big Seam mine run.....	Birmingham..	1.95	1.80	1.80	1.60@ 2.00	
Pool 54-64 (Gas and St.)...	Baltimore.....		1.70	1.45	1.45	1.40@ 1.50	Big Seam (washed).....	Birmingham..	2.35	2.00	2.00	1.75@ 2.25	
Pittsburgh so'd gas.....	Pittsburgh...		2.65	2.40	2.40	2.30@ 2.50	S. E. Ky. lump.....	Chicago.....	2.85	2.10	2.10	2.00@ 2.25	
Pittsburgh gas mine run.....	Pittsburgh...			2.10	2.10	2.00@ 2.25	S. E. Ky. mine run.....	Chicago.....	2.10	1.50	1.50	1.25@ 1.75	
Pittsburgh mine run (St.)...	Pittsburgh...		1.95	1.85	1.85	1.75@ 2.00	S. E. Ky. lump.....	Louisville.....	2.70	2.10	2.10	2.00@ 2.25	
Pittsburgh slack (Gas)....	Pittsburgh...		1.45	1.20	1.20	1.20@ 1.30	S. E. Ky. mine run.....	Louisville.....	1.75	1.55	1.55	1.35@ 1.75	
Kanawha lump.....	Columbus.....		3.00		2.10	2.00@ 2.25	S. E. Ky. screenings.....	Louisville.....	1.00	.95	.95	.85@ 1.10	
Kanawha mine run.....	Columbus.....		1.85		1.50	1.35@ 1.60	S. E. Ky. lump.....	Cincinnati..	3.00	2.50	2.50	2.25@ 2.75	
Kanawha screenings.....	Columbus.....		1.05		1.00	.90@ 1.10	S. E. Ky. mine run.....	Cincinnati..	1.50	1.45	1.45	1.25@ 1.65	
W. Va. lump.....	Cincinnati..		2.85	2.25	2.10	2.00@ 2.25	S. E. Ky. screenings.....	Cincinnati..	.90	.90	.90	.75@ 1.10	
W. Va. gas mine run.....	Cincinnati..		1.50	1.40	1.35	1.25@ 1.50	Kansas lump.....	Kansas City..	4.00	4.50	4.50	4.50	
W. Va. steam mine run.....	Cincinnati..		1.50	1.40	1.35	1.25@ 1.50	Kansas mine run.....	Kansas City..	3.25	3.50	3.50	3.50	
W. Va. screenings.....	Cincinnati..		1.05	.85	.95	.80@ 1.10	Kansas screenings.....	Kansas City..	2.60	2.50	2.50	2.00	
Hocking lump.....	Columbus...		2.75	2.45	2.45	2.25@ 2.65							
Hocking mine run.....	Columbus...		1.85	1.70	1.70	1.60@ 1.80							
Hocking screenings.....	Columbus...		1.25	1.35	1.35	1.10@ 1.25							
Pitts. No. 8 lump.....	Cleveland...		2.55	2.35	2.35	2.10@ 2.75							
Pitts. No. 8 mine run.....	Cleveland...		1.95	1.90	1.85	1.80@ 1.85							
Pitts. No. 8 screenings.....	Cleveland...		1.25	1.10	1.10	.95@ 1.10							

\* Gross tons, f.o.b. vessel, Hampton Roads.

† Advances over previous week shown in heavy type, declines in italics.

\* Gross tons, f.o.b. vessel, Hampton Roads.

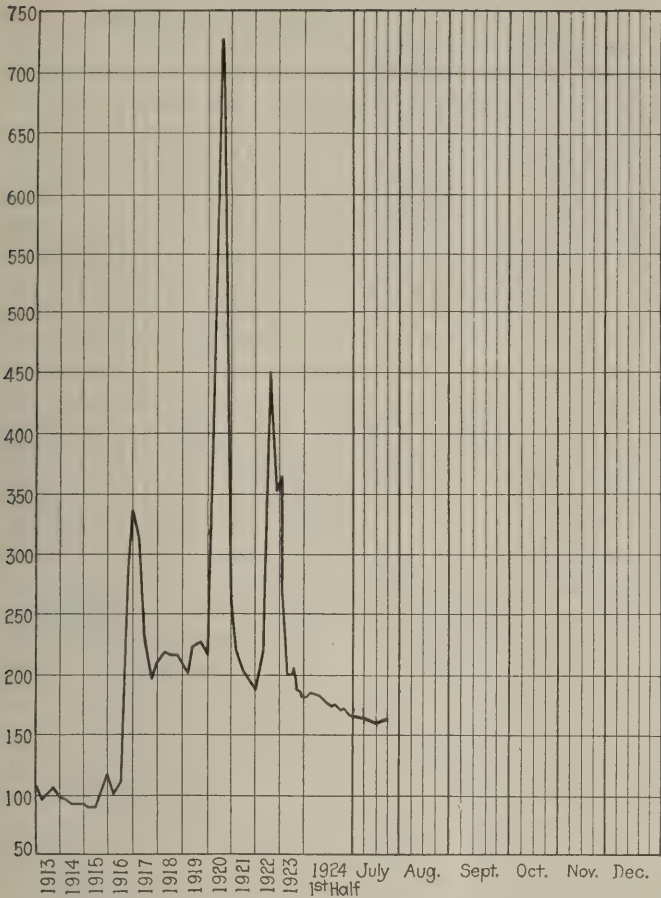
† Advances over previous week shown in heavy type, declines in italics.

### Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

		Market Quoted	Freight Rates	July 23, 1923		July 14, 1924		July 21, 1924†	
				Independent	Company	Independent	Company	Independent	Company
Broken.....	New York.....		\$2.34		\$7.75@ \$8.35		\$8.00@ \$8.95		\$8.00@ \$8.95
Broken.....	Philadelphia.....		2.39		7.00@ 8.10		8.80@ 8.95		8.80@ 8.95
Egg.....	New York.....		2.34	\$8.50@ \$12.00	8.00@ 8.35	\$8.75@ \$9.00	8.55@ 8.95	\$8.50@ \$9.00	8.55@ 8.95
Egg.....	Philadelphia.....		2.39	9.25@ 11.00	8.10@ 8.35	8.90@ 9.60	8.90@ 8.95	8.90@ 9.60	8.90@ 8.95
Egg.....	Chicago.....		5.06	8.50@ 12.00	7.25@ 7.45	7.99@ 8.10	7.94@ 8.00	7.99@ 8.10	7.94@ 8.00
Stove.....	New York.....		2.34	8.50@ 12.00	8.00@ 8.35	9.00@ 9.25	8.55@ 9.20	9.00@ 9.25	8.55@ 9.20
Stove.....	Philadelphia.....		2.39	9.25@ 11.00	8.15@ 8.35	9.25@ 9.90	8.95@ 9.10	9.25@ 9.90	8.95@ 9.10
Stove.....	Chicago.....		5.06	8.50@ 12.00	7.25@ 7.45	8.30@ 8.40	8.24@ 8.34	8.30@ 8.40	8.24@ 8.34
Chestnut.....	New York.....		2.34	8.50@ 12.00	8.00@ 8.35	8.60@ 9.00	8.55@ 9.05	8.60@ 9.00	8.55@ 9.05
Chestnut.....	Philadelphia.....		2.39	9.25@ 11.00	8.15@ 8.35	8.75@ 9.70	8.90@ 8.95	8.75@ 9.70	8.90@ 8.95
Chestnut.....	Chicago.....		5.06	8.50@ 12.00	7.25@ 7.45	8.08@ 8.23	8.18@ 8.24	8.08@ 8.23	8.18@ 8.24
Range.....	New York.....		2.34		8.30		8.80		8.80
Pea.....	New York.....		2.22	6.75@ 8.00	6.00@ 6.30	4.50@ 5.25	5.50@ 6.00	4.50@ 5.25	5.50@ 6.00
Pea.....	Philadelphia.....		2.14	7.00@ 7.50	6.15@ 6.20	5.75@ 6.25	5.75@ 6.00	5.75@ 6.25	5.75@ 6.00
Pea.....	Chicago.....		4.79	7.00@ 8.50	5.30@ 5.65	5.13@ 5.45	5.36@ 5.91	5.13@ 5.45	5.36@ 5.91
Buckwheat No. 1.....	New York.....		2.22	2.75@ 3.50	3.50@ 4.15	2.00@ 2.50	3.00@ 3.15	2.00@ 2.50	3.00@ 3.15
Buckwheat No. 1.....	Philadelphia.....		2.14	2.75@ 3.50	3.50	2.50@ 3.00	3.00	2.50@ 3.00	3.00
Rice.....	New York.....		2.22	1.80@ 2.50	2.50	1.50@ 2.15	2.00@ 2.25	1.50@ 2.15	2.00@ 2.25
Rice.....	Philadelphia.....		2.14	1.75@ 2.50	2.50	2.00@ 2.25	2.25	2.00@ 2.25	2.25
Barley.....	New York.....		2.22	1.25@ 1.50	1.50	1.10@ 1.50	1.50	1.00@ 1.50	1.50
Barley.....	Philadelphia.....		2.14	1.15@ 1.50	1.50	1.50	1.50	1.50	1.50
Birdseye.....	New York.....		2.22		1.60	1.10@ 1.50	1.60	1.00@ 1.50	1.60

\* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.





Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

	1924			1923
	July 21	July 14	July 7	July 23
Index .....	163	162	164	197
Weighted average price .....	\$1.98	\$1.96	\$1.99	\$2.38

This diagram shows the relative, not the actual, prices on four-teen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board.

Western Kentucky operators deprecate reports that the field is busy. It is true that tonnage has been picking up a little, but a large number of mines are closed down by strike, many small mines have not been operating, and the total capacity of operating mines is not much over 50 per cent of field capacity. But production is increasing and some of the operators and jobbers are looking forward to a much better market in August.

Although a little more interest is being manifested by foreign buyers in smokeless coal and although the price is a little higher at tidewater, nevertheless there is not as strong a demand for low-volatile fuel in Eastern or tide-water markets as there is in the West. There is hardly a sufficient supply of prepared grades to fully meet Western demand, as it does not pay producers to prepare too much tonnage because of the low prices prevailing on nut and slack.

Northwest Is Waking

Bituminous prices are the same at Duluth as last reported, but the market is considerably stronger in tone. An independent mining company has purchased 2,000 tons of Youghiogheny screenings on the market, and several other companies are in the field with a buying light in their eyes. A month ago none of the independent mining companies was even remotely interested in the coal business and the mines were shut tighter than a safe. Several large industrial concerns have begun to show signs of life.

While no indication of Mr. Ford's plans has been given since he acquired the Superior Coal & Dock Co.'s dock, it is rumored that he will bring coal here from his mines in

his own ships, of which he has two in water and two building, and will go into the coal business.

Inquiry comes from Winnipeg for hard coal and much is being shipped there, much to the joy of Duluth docks, as only the wealthy are filling their bins there. Prices are firm, with another 10c. advance sure on Aug. 1. The docks hold now about 3,300,000 tons, of which 2,400,000 is free. Thirty-five cargoes arrived last week, of which six were hard coal, and ten are reported on the way, of which one is hard. Shipments are keeping up.

The Milwaukee coal market continues quiet. Jobbers are scouring the country for business, but with little success. A change is not looked for much before September. Nobody seems to want coal just at present. Prices hold steady. The City of Milwaukee has let contracts for about 60,000 tons of coal for delivery to various municipal institutions during the coming winter. The prices, which vary according to length of haul, averaged \$1 per ton less than prices paid last year.

Receipts of coal by lake continue fairly liberal thus far, 339,038 tons of anthracite and 779,343 tons of soft coal having been received.

West Is Buying at Last

Mail orders from dealers for Arkansas semi-anthracite lump indicate that domestic storage is under way throughout the Southwestern district. Immediately before the advance of 50c. in the retail price early this month the heaviest business since last winter was reported. Wholesale prices still are quoted at \$5.50@\$6 for lump, \$3.50@\$4 for mine run and \$2 for screenings. Kansas strip-mine coal is quoted at \$3.75 for lump and \$3.50 for nut. There has been no change in Kansas shaft coal or the Henryetta (Okla.) product.

Conditions in the Colorado market are not much stimulated yet but a few storage orders have been received and operators expect conditions to be almost normal before long. Prices remain unchanged. The transportation and car supply has been very good throughout the state.

In Utah the recent increase in coal prices by operators and retailers has had the effect of stimulating storage business. Mines are working in excess of two days a week now and the output should grow steadily. Lump, which was a drug on the market a few weeks ago, is moving again. In fact, there is a little demand for every grade of coal now. Business is generally conceded to be better now than it was a year ago. Smaller manufacturing plants are buying coal again, as are big industrials such as sugar companies.

Ohio Markets Sluggish

Total lack of interest in the domestic situation marks the Cincinnati market. Retailers have quit buying and the shortening of the supply of residue has stiffened the slack market just a little in bituminous. Many Kanawha mines have suspended operation and some shutdowns are reported from southern Kentucky. Lake buyers still stand off; the tonnage taken is far behind that of last year. Smokeless business is sluggish with screenings the weakest point on the list. Retail deliveries are at the lowest ebb of the year and prices unchanged.

The trade at Columbus is in a slump. Up to recently there was a fair volume of domestic business, but it has dropped off, and orders are far apart and hard to get. This condition is expected to be temporary only, as the general reduction in stocks will soon force some of the larger users into the market. Retail prices are fairly steady at recent levels, but this is due largely to small retail stocks. Pocahontas, smokeless grades and splints are the most popular. Steam business is rather quiet as there is little contracting. While demurrage coal is not as plentiful as formerly, still a considerable amount can be picked up in the local market. School coal is moving in considerable quantities.

While the Cleveland market continues dull and steam demand is quiet, there have been reports of additional mines opening up in the field, and if this is not indicative of actual betterment in trade conditions it at least augurs well for impending improvement. Spot prices have softened slightly during the past week. Activity in the retail trade has not yet appeared, but schools, colleges, greenhouses and certain public institutions are putting in some coal now, but without discernible effect upon the market.



The Pittsburgh market is as dull as ever. Production is light, and much of it by consumers or by strip mines. There is a little trade in high-grade gas coal, but not much even of that. Local consumption is absorbing only a small percentage of the district's producing capacity. The Connellsville region, with its lower wages, has been making strenuous efforts to get coal business, but without much success.

A general feeling among operators in the central Pennsylvania bituminous field is that the bottom of production and prices has been reached, although not much improvement is expected before August. Production for the week ending July 12 was 10,930 carloads, against 8,291 for the previous week, which included the Fourth of July holiday.

The coal situation at Buffalo does not show much change. Increased orders for steel manufactures are reported but no general business revival is in sight. In some quarters it is asserted that the depression has been overstated and that it will not go any further.

The Toronto market is very quiet, with but little demand for anthracite and less for soft coal. The yards are well stocked in anticipation of fall requirements, but few consumers are laying in stocks and business is less active than at this season last year.

### New England Market Nearly Lifeless

In New England the market for steam coal is almost lifeless. Mills are closing down for weeks at a time, often with no date set for opening, and the trade generally is able to do little more than mark time. The few venturesome shippers who still try to force coal on this reluctant market learn to their cost that it is nearly to the saturation point.

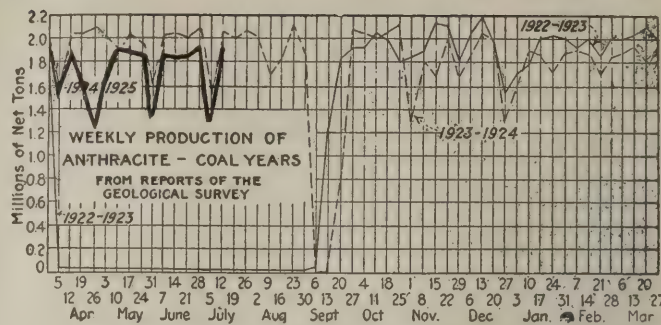
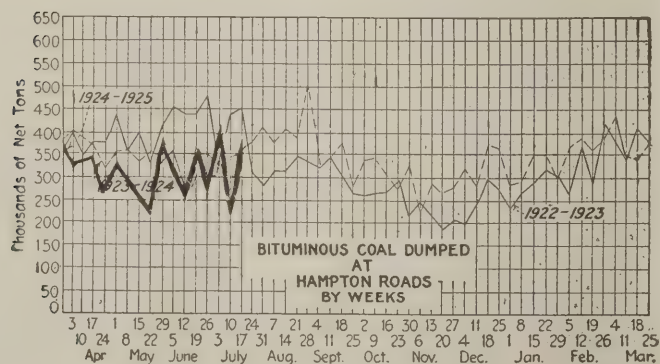
At Hampton Roads the accumulations are moderate, due to a conservative policy on the part of most of the agencies, but quotations are in no wise improved. There is a fair movement off-shore, and this together with coastwise contracts is furnishing outlet for perhaps about a third of what would normally be considered light output.

At Providence, Boston and Portland, for inland delivery, \$5.65@5.75 is still quoted per gross ton on cars, but it is acknowledged that \$5.50 is about the top figure that can be realized on anything exceeding one or two-car lots. This situation effectually shuts out rail coal from territory at all accessible from tidewater, and aside from the few specialties there is practically nothing doing on Pennsylvania coals except in the area around the Connecticut River.

Via the New York and Philadelphia piers there is only a light tonnage moving from the central Pennsylvania districts. Here, too, the bulk of the coal placed is for special uses and is hardly an indication that for ordinary grades there would be any demand except at sacrifice prices.

### Buyers Scarce in Atlantic Seaboard Markets

The New York market drags. Except when bargains may be picked up, buyers are keeping under cover unless it is absolutely necessary for them to get coal. Contracting by public institutions and large consumers has been practically completed save possibly for small lots. An instance of the latter occurred last week when bids were opened for furnishing and delivering alongside for the U. S. Appraiser's Warehouse in New York of 500 gross tons of low-volatile high-grade soft coal. The low bid received was \$4.29 per ton f.a.s., or on a basis of about \$1.16 net ton. f.o.b. mine. Local houses reported a slightly



increased demand for slack and a consequent bettering of quotations. Demand for coke continue quiet.

Outside of an increase in inquiries, there is nothing to indicate that the real buying movement is under way in Philadelphia. Big power plants are adding to their reserves, but are striving to get even lower than current market quotations. The railroads continue to stay out of the market and prospects are not bright yet as to when they will be ready for extra tonnage. Things are a bit better at tide, but bunkering is about as usual. Spot prices are unchanged.

Baltimore notes a strengthening line of inquiry for future deliveries. This is not so marked as to cause any excitement in the trade, but it does give promise of a slow but sure betterment over the midsummer period. There is a general impression here that industrial depression, and with it the slow-down in demand for coal, has about hit bottom, and that from now on a flood tide will begin. The export coal situation in Baltimore shows a decided improvement for the first fifteen days of July as compared to the same period of June.

The Birmingham market remains painfully dull and quiet, but hopeful, though there is no evidence on which to base an early improvement. Industrial conditions are anything but satisfactory, and the coal consumption from this source has been scaled down to a very low point. Spot business is negligible, and deliveries against contracts are on a minimum basis.

### Summer Lull Settles Over Hard-Coal Trade

Demand for domestic hard coals is far from active in the New York market. Straight lots of independent stove coal continue to bring about 25c. more than when taken with any other size, but the activity of the market ends there. Egg coal is not as long as chestnut and for that reason is quoted by some shippers at slightly higher figures than the latter size. Recent cuts in production have had no apparent effect on the local situation. Retail dealers seem to be in good shape to meet all immediate requirements. The larger companies do not have any trouble moving their domestic coals, with the exception of pea, which is accumulating with both "regulars" and "independents." Some of the latter, it is reported, are insisting upon buyers taking a proportionate share of pea with the larger coals. Trouble is experienced in moving the steam coals. Demand is dull and only the better grades of independent product are bringing anything like company schedules.

Retail yards at Philadelphia are quite full of coal of all sizes, including stove. Nut has become particularly sluggish, a few of the smaller independent shippers offering it off price. Pea coal is becoming much easier and egg also has eased off. Steam sizes are doing the most to unsettle the market, for inability to move this coal is clogging the tracks at the collieries.

The hard-coal situation at Baltimore is exceptionally dull. The raise in retail prices probably halted some ordering, and there may be delay over August, as the public is figuring that there will be no further advance Sept. 1. More coal is now being released to Baltimore by mine connections.

### Car Loadings, Surplusages and Shortages

	Cars Loaded—	
	All Cars	Coal Cars
Week ended July 5, 1924.	759,942	111,458
Previous week.	908,355	144,759
Week ended July 5, 1923.	850,080	155,286
	Surplus Cars—	
	All Cars	Coal Cars
July 7, 1924.	359,191	169,607
Previous week.	356,389	162,343
July 7, 1923.	64,067	4,620
	Car Shortage—	
	All Cars	Coal Cars



## Foreign Market And Export News

### British Market Quiet and Irregular; Output Drops to 4,988,000 Tons

The Welsh coal market is quiet and irregular, the tone being not quite so healthy as it was last week. Stocks all round are heavy and prices are weak. Foreign buyers have filled their immediate needs and are withholding orders for future delivery until exchange settles a bit. There also is difficulty in obtaining shipping because the combination of freights on a pre-war basis and expenses about double means that ship owners cannot operate their vessels and make a profit at the same time. In consequence many ships are laid up, and several coaling berths in the South Wales ports are empty on that account. The cheaper prices of the North of England coal also are a handicap in obtaining new business.

The Newcastle market is very depressed and nothing has occurred to brighten the future. Most of the collieries are working hand to mouth.

The Naples gas works has contracted for 36,000 tons of Newcastle gas coal for delivery from July to December, and the Palermo gas works for 10,000 tons of the best Durham coal for delivery in August and September on the basis of current quotations.

A special cable to *Coal Age* states that the production of coal by British mines during the week ended July 5 totaled 4,988,000 tons, according to the official reports. This compares with an output of 5,170,000 tons during the week ended June 28.

### Hampton Roads Looking Up; Foreign Movement Slow

Slight improvement is noted in the movement at Hampton Roads, the volume of business at the piers showing an increase and the vessels reported due for cargo also being on the upward trend. Coastwise business is holding its own, bunkers are fair, but foreign movement appears to have slumped.

The tone of the market is not distinctly firmer, though it has not weakened from a week ago. Prices remain about the same, and supplies are on the increase. The trade, generally, is sitting tight, awaiting whatever the natural channels of business may bring.

### French Market Shows Notable Stability and Firmness

Stability and firmness are outstanding features of the French coal market. With a good but not extraordinary demand, the current of orders is sufficient to absorb the output of industrial coals and the household fuel situation is satisfactory.

The Nord and Pas-de-Calais collieries have agreed to extend until Sept. 30—and possibly until Dec. 31—the wage increases recently granted. Prices therefore remain unaltered, save for the 0.20 fr. per ton extra charge consequent on the application of the supplementary taxes voted by Parliament.

In order to increase the marketing of ovoids and briquets, which are rather neglected at this time of the year, the northern coal fields are giving summer rebates of 8 fr. on the price of these fuels; these reduced prices will remain effective probably until Sept. 15.—The Belgian collieries have decided to take similar steps.

There is little activity in British coals at the present time, the orders for anthracites having practically completely disappeared.

At its meeting on June 24, the Coal Consultative Committee approved the abrogation of export restrictions and the decree will be published shortly.

During the month of June the O. R. C. A. was supplied with 417,806 tons of coke, or a daily average of 13,900 tons. The price of coke remains at 150.75 fr. for July.

The new Dusseldorf accord as of

July 1 includes the clauses of the agreement signed April 15 but with the following modifications: Reduction of the coal tax to 0.75 mark per ton; reduction of the licenses and allowances taxes to half of their former rate; tax on the circulation of byproducts reduced to 1 per cent; delivery of byproducts limited to 10 per cent benzol, 8 per cent sulphate of ammonia, 6 per cent pitch, 8 per cent other byproducts. The first three reductions are retroactive to June 16. The deliveries corresponding to the period of the strike (May 1 to June 7 inclusive) will be reduced to 27 per cent of the effective production during the same period of time.

### Export Clearances, Week Ended July 19, 1924

FROM PHILADELPHIA		Tons
For Brazil:		
Jap. Str. Denmark Maru for Rio de Janeiro or Santos.....		—
For Cuba:		
Nor. Str. John Bakke for Gibara..		—
For West Indies:		
Nor. Str. Ravenfjell for Kingston.		—

FROM BALTIMORE		Tons
For Algeria:		
Ital. Str. Vodice.....		6,391
Jap. Str. Kiefuka Maru.....		7,977
For France:		
Belg. Str. Caledonier .....		7,453
For Italy:		
Ital. Str. M. T. Cicerone.....		9,452
For Nova Scotia:		
Dan. Str. Kirsten Jensen.....		5,120

FROM HAMPTON ROADS		Tons
For Brazil:		
Br. Str. Teesbridge for Rio de Janeiro .....		5,102
Br. Str. Ethelfreda for Rio de Janeiro .....		6,425
For Italy:		
Ital. Str. Laura for Trieste.....		4,678
For West Indies:		
Nor. Str. Dagali for Kingston....		2,003

### Hampton Roads Pier Situation

	July 10	July 17
N. & W. Piers, Lamberts Pt.:		
Cars on hand.....	1,377	1,728
Tons on hand.....	97,819	75,026
Tons dumped for week.....	85,300	139,975
Tonnage waiting.....	12,000	20,000
Virginian Piers, Sewalls Pt.:		
Cars on hand.....	1,701	1,429
Tons on hand.....	122,850	99,450
Tons dumped for week.....	65,031	109,560
Tonnage waiting.....	15,515	7,084
C. & O. Piers, Newport News:		
Cars on hand.....	1,865	2,164
Tons on hand.....	96,160	105,830
Tons dumped for week.....	59,856	84,037
Tonnage waiting.....	2,200	4,260

### Pier and Bunker Prices, Gross Tons

PIERS		July 12	July 19†
Pool 9, New York.....	\$4.60@ \$5.00	\$4.75@ \$5.00	\$4.75@ \$5.00
Pool 10, New York.....	4.50@ 4.75	4.50@ 4.75	4.50@ 4.75
Pool 11, New York.....	4.25@ 4.50	4.25@ 4.50	4.25@ 4.50
Pool 9, Philadelphia.....	4.70@ 5.00	4.70@ 5.00	4.70@ 5.00
Pool 10, Philadelphia.....	4.45@ 4.70	4.45@ 4.70	4.45@ 4.70
Pool 11, Philadelphia.....	4.30@ 4.50	4.30@ 4.50	4.30@ 4.50
Pool 1, Hamp. Roads.....	4.25	4.20	4.20
Pool 2, Hamp. Roads.....	4.10	4.10	4.10
Pools 5-6-7, Hamp. Rds..	4.00	4.00	4.00

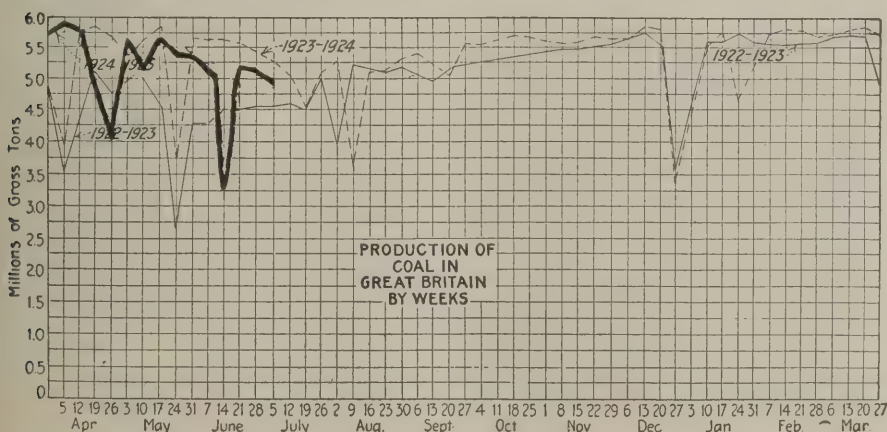
### BUNKERS

Pool 9, New York.....	4.85@ 5.25	5.00@ 5.25
Pool 10, New York.....	4.75@ 5.00	4.75@ 5.00
Pool 11, New York.....	4.50@ 4.75	4.50@ 4.75
Pool 9, Philadelphia.....	5.00@ 5.30	5.00@ 5.30
Pool 10, Philadelphia.....	4.75@ 4.95	4.75@ 4.95
Pool 11, Philadelphia.....	4.50@ 4.70	4.50@ 4.70
Pool 1, Hamp. Roads.....	4.30	4.25
Pool 2, Hamp. Roads.....	4.15	4.10
Pools 5-6-7, Hamp. Rds..	4.00	4.00

### Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations by Cable to Coal Age		July 12	July 19†
Admiralty, large.....	28s. @ 29s.	28s. @ 28s.6d.	28s. @ 28s.6d.
Steam smalls.....	18s.	18s.	18s.
Newcastle:			
Best steams.....	20s. @ 24s.	19s. @ 19s.6d.	19s. @ 19s.6d.
Best gas.....	23s. @ 23s.6d.	23s. @ 23s.6d.	23s. @ 23s.6d.
Best bunkers.....	22s.	18s. @ 21s.	18s. @ 21s.

† Advances over previous week shown in heavy type, declines in italics.







## News Items From Field and Trade



### ALABAMA

A new mine is being opened by Olin Goodwin near Dora, Walker County, a good force now being employed in the development work.

J. S. Chalmers has been appointed superintendent of the Nauvoo operations of the Monro-Warrior Coal & Coke Co., succeeding Chas. Blanchard.

The Alabama Company is constructing a 2,400-ton Montgomery coal washer at its new opening at Lewisburg, and work of sinking the slope is progressing satisfactorily.

The Ensley-Southern Ry., formerly operated under the management of the Southern Ry. system, has been placed in the hands of a receiver by the federal courts on application of the latter road. The Ensley Southern, which operates a short mileage serving coal mines in the Walker County field and Birmingham, on the Warrior River, has been in financial straits for some time. A. B. Aldridge, president of the Stith Coal Co., was appointed receiver by the court, with instructions to continue the operation of the line for the present.

The 10 per cent reduction of wages announced July 10 by the Woodward Iron Co., Birmingham, affected all employees except common labor, including coal miners. Although no official announcements have been made, one or more other companies have made or will make wage reductions, it is reported. The Woodward company produces little or no coal for the commercial market and none for the domestic trade, the output being coked for its own furnace use. The reduction was due to the selling price of iron dropping below cost.

### ILLINOIS

The McLean County Coal Co., of Bloomington, has sold its office building, at the southwest corner of Main and Market Street, in that city, to W. J. Moran, of Peoria.

John Hayes has resigned as mine manager of the Kathleen mine of the Union Colliery Co. at Dowell, and has been succeeded by Edw. Leming, formerly assistant at the same mine. John Meyers is now connected with the company as an assistant mine manager.

During the first six months of 1924 the 81 mines in the Fifth and Ninth districts of Illinois—the region immediately east of St. Louis, Mo.—mined 1,482,192 tons of coal less than during the same period the year before. The total production for the 1924 period was 5,312,592 tons. The total working

time was but 25,072 hours, as compared with 37,586 hours in the 1923 period. This represents a net average of only 52 working hours a month for each mine during 1924. In June 49 mines were idle and the other 32 averaged only 37 per cent running time.

### INDIANA

The mule barn at the Interstate mine, near Clinton, was burned recently and only two of twenty-two mules were saved. The origin of the fire is not known. The mine had been working about four days a week and had expected to start on a more extensive scale.

Edwin D. Logsdon, president of the Knox Consolidated Coal Co., of Indianapolis, has been elected a member of the board of directors of the Fletcher American National Bank, one of the strongest financial institutions in Indiana. He succeeds the late Crawford Fairbanks, of Terre Haute, well known to the coal trade.

A crowd estimated at 10,000 attended the recent eighth annual state first-aid meet at Princeton. Twenty-one teams competed. First place was won by the Peerless mine of the Templeton Coal Co., from Sullivan, and second by the Clinton Coal Co., of Clinton. A banquet was held in the evening. John L. Lewis, International president of the United Mine Workers, and other union officials spoke. The meet was under the direction, as usual, of the Joseph A. Holmes Mine Safety Association.

### KANSAS

August Dorchy, deposed vice-president of District 14 of the United Mine Workers, will appeal to the U. S. Supreme Court from the Kansas Supreme Court's decision that he must complete a six-months' jail sentence in Cherokee County and pay a \$500 fine. Dorchy along with Alex. Howat was convicted and sentenced for calling a mine strike in violation of the Industrial Court law. The U. S. Supreme Court decided the wage-fixing sections of the law were unconstitutional. The Kansas court held that the anti-strike section is valid and that therefore Dorchy is still a prisoner.

### KENTUCKY

Attorneys for the Harlan Coal Co., Louisville, probably will make a motion for a new trial in a case lost a few days ago against the Wheeler Coal Co., in Judge Gordon's court at Louisville.

The Harlan company filed suit in 1920, alleging that under a contract made in 1919 the company was to acquire the entire output of the Wheeler company mines, and that the Harlan company was damaged to the extent of \$75,000 by failure of defendants to abide by its contract.

The Elkhorn Coal Corporation, Fleming, is recalling its old employees following a resumption of its mines at Fleming, Haymond and Hemphill on a full-time basis.

The largest contracts announced for some time were reported from Frankfort, July 15, when the State Board of Charities and Corrections placed contracts on nut and slack, or steam coal for use in the various state institutions. These contracts call for 646 cars, or approximately 32,300 tons, based on cars of 50 tons capacity, and prices average about 75c. a ton under prices paid last year, or a saving of about \$24,225 to the state. Prices of \$1.10 a ton were paid on eastern Kentucky coal at the mines, and from \$1 to \$1.25 for western Kentucky on short hauls from western Kentucky mines.

### NEW YORK

The Harbor Coaling Corporation of New York City, a Delaware corporation, has been granted permission to increase its capital from \$5,000 to \$25,000.

R. M. Bryan, who for more than 17 years was the eastern manager for *The Black Diamond*, has resigned to assume charge of veterans' tours to France inaugurated by the United States Lines of government-owned steamships.

The Harbor Coaling Corporation, 10 Bridge Street, New York, has leased from the Lehigh Valley R.R. the latter's rebuilt National dock, on the west shore of the Hudson River at Communipaw, N. J., for ten years with privilege of renewal.

### NORTH DAKOTA

Fire of unknown origin destroyed the tippie and hoisting shaft of the Archibald mine, near Foxholm, July 10, causing damage estimated at \$10,000. Only one man was in the mine at the time the fire was discovered, and he was hoisted to safety by another employee.

### OHIO

Although coal mines in the eastern and north central region of Ohio operated 65 per cent of the full-time capacity during the month of June,



only two fatal accidents were reported, it was announced recently. Inspections were made of 130 mines, or 55 more than during the month of May.

## OKLAHOMA

Chas. N. Gould was appointed director of the Oklahoma Geological Survey at Norman, beginning July 1. Dr. Gould organized the Survey and was its first director in 1908. He formulated its earlier policies and resigned in 1911 to enter consulting work. Dr. D. W. Ohern was appointed his successor. Three years later, when he resigned, C. W. Shannon was placed in charge. The Survey appropriations were vetoed a year ago by the then Governor Walton. In the interim Prof. Chas. E. Decker, of the State University, has been acting custodian. The special session of the Legislature made a small appropriation for the maintenance of the Survey and placed it under the control of the Board of Regents of the university. Dr. Gould announces as his policy the development of Oklahoma's natural resources and solicits the co-operation of every citizen interested in the development of these dormant resources.

## PENNSYLVANIA

The U. S. Bureau of Mines has opened a branch station devoted to coal-mining research at 801 Coal Exchange Building, Wilkes-Barre. D. C. Ashmead is in charge.

Walter Thayer has been appointed coal traffic manager of the Eastern region of the Pennsylvania R.R. system, according to an announcement by Geo. D. Ogden, traffic manager. Mr. Thayer's headquarters will be at Philadelphia.

C. Larry Marlatt, of North Scranton, has been named as general superintendent of the Mount Jessup & Bald Mountain Coal Co., according to an announcement made in New York by William H. Grady, general manager

for Whitney & Kemmerer, who own the mine. Mr. Marlatt had for the past eighteen years been with the Hudson Coal Co., starting on the surveying corps in 1906, and working up through the engineering department and production department.

At Paxinos, eight miles north of Shamokin, a large creek washery breaker owned by W. A. Sees, of Wilkes-Barre, was blown over and collapsed on the state highway on June 25 during a severe wind storm.

The Pittsburgh & Eastern Coal Co., of Cleveland, is erecting a new and larger tippie at its Cherry Valley mine, in Washington County.

With a program of \$20,000,000 in improvements being outlined for the Johnstown plant of the Bethlehem Steel Corporation, extra power will be needed and work has been started on clearing the ground for the erection of a large power plant in Franklin. Five new mills will be added to the Gautier plant and work on clearing old buildings and dwelling houses from the land they will occupy has been started.

Coal companies in the Gallitzin fire district, which takes in large portions of Cambria County, planted 900,000 forest trees this year. Many of the coal companies are buying idle farm land and planting forest trees. The foresters in this district have set the goal at five million trees, in order to reforest the denuded lands in the coal fields. Assistant District Forester T. I. Shirley, of Johnstown, is giving all possible assistance to companies and individuals reforesting vacant land.

The H. C. Frick Coke Co. is now using the five-mile belt conveyor system recently installed to convey the coal underground from the Colonial Nos. 2, 3 and 4 mines at Grindstone, Rows Run and Smock to the Monongahela River near Fayette City through the old Alice mine main entry, acquired from the Pittsburgh Coal Co. for that purpose. The coal is fed on to the belt at the inner end by a 35-car revolving

dump furnished by the Car Dumper & Equipment Co., of Chicago, and at the outer end is loaded in barges in the river, and taken mostly to the by-product ovens of the Carnegie Steel Co. at Clairton.

Attorneys acting for David Lloyd, former Glen Alden Coal Co. superintendent, purchased the Oak Run Coal Co. at Archibald, for \$50,100, at a receiver's sale in the Lackawanna County court house, Scranton, July 18. Several interests bid for the property. The Oak Run mine, a slope operation on the mountain east of Archibald, formerly was known as the Wachna mine. Coal taken from lands owned by the John P. Farnham estate have been transported by aerial tramway down the mountain 3,300 ft. to the breaker. The company went bankrupt several months ago. David R. Humphrey, of Peckville, was president, and John J. Owens, former Assistant District Attorney of Lackawanna County, was secretary-treasurer.

Five to six hundred men have been idle at Nant-y-Glo, Cambria County, since July 15, according to word received by Superintendent John W. Harrison of the Heisley Coal Co. The Heisley mines have been working steady for two months, loading more than 40,000 tons of coal during May and June. The company contemplated a shutdown in April but continued in the hope that conditions would improve. The reason confided to the superintendent by officials of the company is that the company is unable to compete with the non-union mines. It was intimated that if the men would accept the 1917 scale it might be possible to keep the operations working at least a part of the time.

School boards in a half dozen cities and boroughs of the anthracite region are giving consideration to the installation of small-sized coal burning grates in the heating plants of the school buildings under their jurisdiction. The action is believed to be a result of the campaign conducted by anthracite producers, urging the use of small size fuel. Among the school directors contemplating the change are those of Hazleton, Carbondale, Olyphant, and other places.

Judge Koch issued a decree of foreclosure recently in the case against the Schuylkill Valley Coal Co., of Port Carbon, brought by the bondholders, represented by a Pottsville bank. The decree will enable the bondholders to reopen the operation, which has been closed for months. The company has had financial difficulties for months past, and employees, unable to collect back pay, started legal proceedings. The claims, amounting to \$24,000, have now been paid and the mine has been cleared of water and is ready for operation.

There were eighty-three fewer fatal accidents in Pennsylvania during the first six months of 1924 than during the same period of 1923, according to Secretary of Mines, Joseph J. Walsh. During the first six months of this year 412 miners lost their lives in accidents while 495 miners were killed in the first six months of last year. The decrease in the number of deaths was divided about



Courtesy U. S. Distributing Corp.

### Mine Cars on Way to Tippie at Acme Mine

It can be seen by the foliage on the hill in the rear that this mine is in the far West. It is located in Sheridan County, Wyoming, and is the property of the Sheridan-Wyoming Coal Co.



evenly between the anthracite and the bituminous fields. A total of 248 miners was killed in the anthracite mines during the past six months as compared with 289 in 1923, or a decrease of 41 deaths. In the bituminous field 164 men were killed in accidents during the first half of 1924 as contrasted with 206 in 1923, a drop of 42 deaths. The decrease represented 14 per cent of the former fatalities in the anthracite field and 20 per cent of the 1923 totals in the bituminous mines.

## UTAH

Utah's coal output for June amounted to 261,975 tons, compared with 333,230 tons for the same month last year. In 1923 the figures were 337,629. June 1921 showed only 220,941 tons, but the previous year showed an output of 531,600 tons, or more than twice as much as June, 1924.

## WASHINGTON, D. C.

A decision in the mine-rating case is not expected before autumn. Fully a month must be allowed for the delays incident to the vacation period. The rules covering car distribution are closely related with the assigned-car case. The postponement of the effective date in the latter proceeding until Nov. 1 is thought to indicate that the Interstate Commerce Commission hopes to be able to hand down that decision prior to that date. It is expected that each of these decisions will be handed down at about the same time.

## WEST VIRGINIA

A state first-aid meet will be held at the State Fair Grounds at Wheeling on Sept. 4 at 9 a.m. The contests are open to teams of all coal companies in the state. The winners will be declared state champions and awarded the cup, which is at present held by the Thomas team of the Davis Coal & Coke Co.

The following coal companies have filed certificates of dissolution with the Secretary of State of West Virginia: Huntington Coal Sales Co., Acme-Eagle Coal Co., Fielder-Davis Fuel Co., Greenmount Fuel Co., Jarvis Coal Co., Rich Block Coal Co., Hutton-Beal Coal Co., New Pocahontas Coal Co., Harry's Branch Coal & Coke Co., D. K. C. Coal Co., Hendricks Coal Co., Coolidge Coal Co., and the Imperial Coal Sales Co., which was dissolved by deed of sale.

Coal companies recently dissolved and the charters of which have been surrendered include the Miami Coal & Coke Co., of Moundsville, and the Greenmount Fuel Co., of Morgantown.

The Lillybrook Coal Co., at Sullivan, near Beckley, Raleigh County, is putting the finishing touches to a modern mine and expects to start operating about Sept. 1. Two seams of coal will be worked at this mine, the Beckley seam by drift mining and one of the Pocahontas seams by shaft. An addition was made to the town. The tipple is of steel, having shaker screens and

picking tables, and a semi-automatic substation is being completed which can be set to divert most of the power to the workings in the seam yielding the coal most desired at any particular time. This arrangement will halt only one operation in case of overloading.

Scott's Run, in Monongalia County, was the scene of a recent pitched battle between different factions of the United Mine Workers over the election of a checkweighman. The trouble started in the union hall, but the miners went into the open to settle the dispute. One miner, Joe Susac, unable to obtain recognition and to gain the floor, wielded a knife to cut his way to recognition. In a minute rocks and bricks were flying through the air and members of the contending factions were flaying each other with pickhandles. When Sheriff Yost arrived Mike Rockvitch had been cut about the legs, arms and body and Joe Susac was still in action. Joe and Pete Rockvitch were arrested and put in jail. In the meantime there was no agreement on a checkweighman.

The Hudson Coal Co., of Clarksburg, recently entered into an arrangement with the Metropolitan Life Insurance Co. to insure the lives of its employees through the medium of a group policy, under the terms of which no medical examination is required, while supplementary to the provisions of the policy the workers are entitled to the services of Metropolitan nurses in case of sickness or injury. They also will receive at stated periods health pamphlets issued by the insurance company. The total insurance amounts to \$136,000, the protection for individuals ranging from \$1,000 to \$1,500. In the case of sickness or injury \$10 a week is paid for twenty-six weeks.

## WISCONSIN

The Great Lakes Coal & Dock Co. has leased the docks once occupied by the Central Coal Co. on Canal Street, near the Twenty-seventh Street Viaduct, in Milwaukee, and is now storing coal upon it. About 15 cargoes have been received by the company thus far this season.

## WYOMING

Clyde N. Fisher, cashier of the Gunn-Quealy Coal Co., Rock Springs, Wyo., who disappeared July 15 with the semi-monthly pay roll of the company, was shot and fatally wounded early the next day by J. Walker, mine foreman and friend of Fisher. He died a few hours later without making a statement. Search of the vicinity where the shooting occurred revealed a caché of food, water and blankets, also the entire payroll, which totaled more than \$6,000.

Wyoming may soon have a new railroad that will open up more coal lands in the southwestern quarter of the state. The Wyoming & Colorado Shortline has been incorporated by Colorado and Wyoming men and has now applied to the Interstate Commerce Commission for the right to construct a 380-mile line from Casper

southwest to the state line. Oil, timber and cattle probably will be the principal freight produced along the new road.

## CANADA

The Gibson Collieries, Ltd., of Drumheller, Alberta, has been adjudged bankrupt and a receivership order issued appointing the Security Trust Co., Ltd., custodian.

Supplementary estimates passed in the House of Commons at Ottawa contain an item of \$200,000 to provide for transportation of Canadian coal from Alberta and Nova Scotia to central Canada by the Canadian railways.

In order to encourage the shipment of coal from Alberta to the provinces of Ontario and Quebec the Dominion government has appropriated \$200,000, for payments to railway companies to make up losses which may be incurred by them in granting reduced freight rates. This policy is a concession to the demands made by several cities of central Canada.

The movement for negotiation of a separate agreement between Gladstone Local of the miners union, at Fernie, B. C., and the management of the Crows Nest Pass Coal Co., which for some days promised a settlement of the strike in the eastern British Columbia section of District No. 18, U. M. W. A., has been broken. District President Sherman visited Fernie on learning of the development. Addressing a mass meeting of the miners of Fernie, Michel and Coal Creek he promised immediate additional relief to the extent of \$3,000 and that a meeting of the International Executive Board was to be held at Indianapolis to discuss the situation in District 18. Finally they resolved to stick out for the Jacksonville agreement. Then they declined the company's offer based on a 12 per cent higher rate of wages than that now in effect in the Vancouver Island Coal Mines.

## Trade Literature

**The Buffalo Forge Co.,** Buffalo, N. Y., has issued a folder designated as Form 1875 describing the operation and use of the Buffalo coal burner for burning junior grades of coal.

**The Hoar Shovel.** Hoar Shovel Co., Duluth, Minn. Pp. 24; 7½x10½ in.; illustrated. The use of this shovel for mucking is described and its operating costs are given. The shovel is shown working both on the surface and underground.

**Heine Bent-Tube Boilers.** Heine Boiler Co., St. Louis, Mo. Bulletin 54. Pp. 25; 8x11 in.; illustrated. Describes the general design, circulation, construction, supports, trimmings and accessories of the V-type boilers.

**The Detroit Electric Furnace Co.,** Detroit, Mich., has issued a booklet on **Brass Melting.** It tells how the electric furnace is a factor of ever-increasing value in brass melting; it enumerates the economies effected by the electric furnace and then shows how complete control of analysis, color, texture and homogeneity of the alloy is secured through the electric furnace. The bulletin is known as No. 41.

**Air Filters for Compressors and Internal Combustion Engines.** Mid West Air Filters, Inc., 100 E. 45th St., New York City. Pp. 24; 8x11 in.; illustrated. Among the advantages claimed for these filters are full efficiency in the operation of compressors and engines, and the equipment depending on them, less oil, longer life and fewer shutdowns. Tables and useful data are included.



## Traffic News

### Commerce Commission Makes Western Coal Rates Decision

The June 9 decision of the Interstate Commerce Commission on what is known as the Western coal rates case has been published. The commission reduces to 40c. its 1923 ruling which fixed a 50c. differential in favor of the Castlegate region over the Rock Springs-Kemmerer region on coal going to points west and north of McCammon, Idaho. It declined, however, to separate the Rock Springs and Kemmerer fields into two rate groups, even though Kemmerer is 85 miles west of Rock Springs. This was because very little Kemmerer coal competes with Utah coal west of McCammon.

The commission withdraws its recent order increasing from 10 and 12c. to 40c. the differential on west-bound coal enjoyed by the Sego mine of the American Fuel Co., about 95 miles east of Castlegate, Utah, over the mines of the Cameo-Faliscade district of Colorado. The old rates are to prevail until the commission makes a decision in No. 13,509.

The establishment of joint rates on Castlegate coal to points in Oregon and Washington on the Northern Pacific, Great Northern, C. M. & St. P. and the Spokane, Portland & Seattle railroads such as apply on the Union Pacific was refused. However, Commissioners McManamy, Aitchison, Eastman, Campbell and Cox, comprising almost a majority of the commission, dissented.

### May Take Northwest Rates To Court for Test

Hints are being given in the all-rail trade that if the recent petition for a rehearing of the case of the dock association against the all-rail carriers fails, there probably will be a move to bring the case into court for a test. The first step would be an injunction to restrain the enforcement of the new rates, which would come shortly before the time for them to become effective—Aug. 21. A temporary injunction doubtless would be issued, which would suspend the rates until the case came up in court, which might take several months. The railroads affected seem to be proceeding with the preparation of the new tariffs, and do not seem inclined to offer any objection to increased revenue rates.

### Want Joint Rates to Frankfort From All Kentucky Fields

The Frankfort (Ky.) Chamber of Commerce and various coal concerns of that city have jointly petitioned the Kentucky State Railroad Commission to require the Louisville & Nashville R.R. and Frankfort & Cincinnati R.R. to establish joint rates with other roads from all coal fields of the state to Frankfort, the complaint charging that there are no joint rates on coal transported and delivered at Frankfort, and that coal handlers or consumers are compelled to take coal from mines on lines of the Louisville & Nashville.

## Obituary

Business troubles led W. J. Elliott, of Princeton, W. Va., treasurer of the Wysong-McCoy Coal Co., to take his own life. His wife found him dead in his office, a pistol on the floor nearby. Mr. Elliott was formerly cashier of the Bank of Matoaka, president of the Rock District Board of Education, Sheriff of Mercer County from 1916 to 1920 and cashier of the First National Bank of Princeton.

Mrs. F. A. Reed, mother of Geo. W. Reed, vice-president of the Peabody Coal Co., in charge of sales, died suddenly at her home Wednesday, July 16, 1924. The funeral was held Friday the 18th from the home of her son, 7136 Luella Ave., Chicago.

Reese E. Evans, age 67, secretary of the Bessemer Coal, Iron & Land Co., of Bessemer, Ala., died at Biloxi, Miss., July 13 after an illness of long duration. Mr. Evans had been in the Birmingham district for the past forty years and was widely known and possessed a host of friends who will mourn his passing.

## New Companies

The Gray Coal Co., of Gray, Ky., capital \$10,000, has recently been chartered by J. T. Gray, Mattie Gray and J. H. Gray.

The Pike County Collieries Co., of Danville, Ill., capitalized at \$262,500 to own, lease and operate coal mines, has been authorized to do business in Indiana as a foreign corporation, with C. F. Shannon, of Petersburg, Ind., as state agent.

The Standard Fourth Vein Coal Co. has been organized at Linton, Ind., by G. B. Taylor, A. G. Schneiderhelm, C. F. Sherrard, F. J. Schneiderhelm and Pearlle Poole to mine coal and other minerals. The company's capital is 5,000 shares of no par value.

The following bituminous coal companies have been incorporated in Pennsylvania: Windber Coal Mining Co., Johnstown, capital, \$25,000; incorporators, Irving L. Camp, Wayne Street, Westmont, Johnstown, treasurer; C. E. Schooley, Johnstown, and G. C. Trueaux, Windber. Punxiana Coal & Coke Co., Indiana; capital, \$800,000; this company was formed by the merging of the Punxiana Coal & Coke Co. and the Meco Coal Co. H. A. Snyder, Indiana, is treasurer, and the company's purpose is to mine coal and manufacture coke.

## Coming Meetings

Western Canada Fuel Association. Convention Aug. 5 and 6, 1924, Brandon, Manitoba, Can. Secretary, W. H. Morrison, Winnipeg, Man., Can.

Rocky Mountain Coal Mining Institute. Summer meeting, Aug. 7-9, Rock Springs, Wyo. Secretary, Benedict Shubart, 521 Boston Bldg., Denver, Colo.

New York State Coal Merchants Association, Inc., 14th annual convention, Sept. 4-6, Stamford-in-the-Catskills, N. Y.; headquarters Churchill Hall. Executive Secretary, G. W. F. Woodside, Arkay Building, Albany, N. Y.

American Chemical Society. Fall convention Sept. 8-11, 1924, at Ithaca, N. Y. Secretary Gas and Fuel Section, O. O. Malleis, the Koppers Co., Pittsburgh, Pa.

Oklahoma Coal Operators' Association. Annual meeting Sept. 11, 1924, McAlester, Okla. Secretary, A. C. Casey, McAlester, Okla.

Association of Iron and Steel Electrical Engineers. Annual meeting and exposition at Duquesne Garden, Pittsburgh, Pa., Sept. 15-20. Secretary, John F. Kelly, 1007 Empire Bldg., Pittsburgh, Pa.

National Safety Council. Thirteenth annual safety congress Sept. 29 to Oct. 3, Louisville, Ky. Managing director and secretary, W. H. Cameron, 168 No. Michigan Ave., Chicago, Ill.

American Institute of Mining and Metallurgical Engineers. Fall meeting, Birmingham, Ala., Oct. 13-15. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

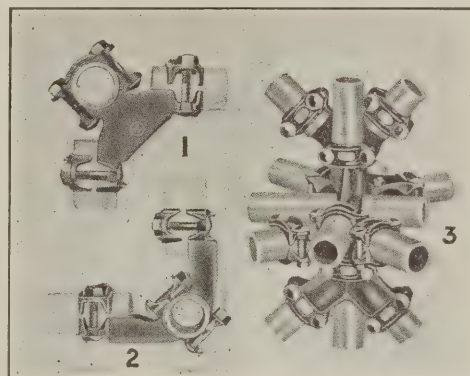
American Institute of Electrical Engineers. Fall convention, Pasadena, Calif., Oct. 13-17. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

## New Equipment

### Pipe Fittings for Electrical Switching Equipment

Structural interchangeable pipe fittings, designed for use with common wrought-iron or steel pipe in the erection of outdoor or indoor electrical switching equipment, recently have been put on the market by the Westinghouse Electric and Manufacturing Co. Though designed primarily for electrical installations, they are equally available for the construction of racks, railings and bench or table frames, electric sign structures, playground apparatus and dairy stable stanchions.

Pipe is a convenient material for structural work of this kind as it is light for its strength, has a symmetrical cross section which resists bending equally well in any direction, and can be cut easily and rapidly with inexpensive tools by inexperienced labor. The fittings are more adaptable



### Interchangeable Fittings for all Kinds of Pipe Framing

(1) Four-way or side-outlet tee; (2) Another side-outlet tee; (3) Six-way fitting with double 45-deg. brace showing great adaptability of fittings.

than those designed for ordinary plumbing. They are made of high-grade malleable iron with a minimum tensile strength of 50,000 lb. per square inch, are light in weight, compact and neat in appearance.

The only tools necessary to erect a structure with these fittings are a pipe vise and cutter and an open-end or socket wrench for each of the two sizes of bolts used. Changes in and additions to such a structure are made with facility. The principal feature of the design of the new fitting is a ribbed yoke which clamps over the pipe and is attached with heavy carriage bolts to the other unit part. Various other units consist of two or more yokes cast in a single piece through connecting webs. As the bolt spacings are uniform, parts designed for a certain size pipe are interchangeable with all others for that size. When the fittings are bolted they yield slightly, due to the malleable characteristic of the iron, until they fit the pipe perfectly.

Ordinary carriage bolts galvanized

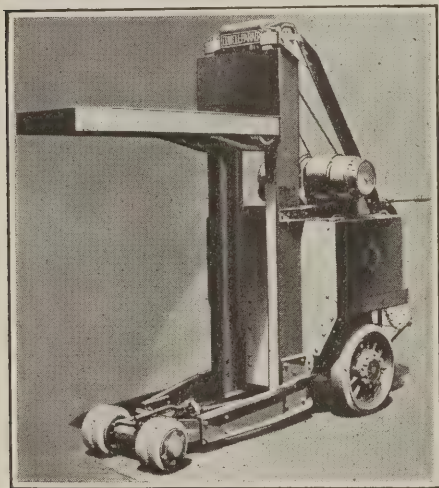


by the hot-dip process, are used, the square shank under the head fitting into the square hole in the fitting, so that assembly can be made with a single wrench. The fittings are designed for two standard pipe sizes, 1½ in. and 2 in., and for a combination of these sizes, with a few fittings of ¾, 1 and 1½ in. size for light switchboard frames and for clamping insulators to pipe frames. They have a black gloss baked finish for indoor use or are galvanized for outdoor installations. With galvanized pipe and fittings, an outdoor structure which will resist weather conditions for years without maintenance cost can be provided.

### Elevates and Transports Loads

A storage-battery elevating truck and tractor by which a load can be picked from the floor or placed upon it, the loading platform requiring little clearance, is being manufactured by the Elwell-Parker Electric Co., Cleveland.

The elevator head at the forward end may be equipped with two or more forks at the floor line, 1 to 2 in. thick and of proper spacing and length to handle bales, boxes or barrels, car wheels, receptacles or the like. When fitted with a pair of arms 18 in. above the floor, barrels may be handled and when equipped with a single horizontal



**Battery-Operated Elevating Truck**

Equipped so as to be able to handle almost any kind of load this new machine is both an elevating truck and tractor. Automatic safety devices make it easy to operate.

shaft the machine may be used in handling coils or wheels.

The machine is made up of the company's standard tractor-type, hot-riveted tractor frame with battery compartment and hinged cover. The operator's seat is located forward to provide an unobstructed view of the movement of the elevator. The seat is arranged to actuate the electric circuit breaker connecting the battery to the controller located in a separate compartment. The circuit breaker closes only when controller drum is in off position and the controller comes to full stop when reversing. A brake pedal with heel-operated latch is located on the footboard, actuating dual contracting shoes on a 7-in. brake drum.

The drive axle is located at the ele-

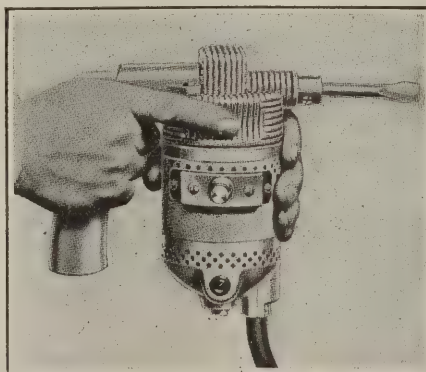
vator or front end to assure traction by under all conditions of loading. The wheel base is short, and all four wheels equipped with 7-in. double-row ball bearings and 20 x 3½ in. tires. The hoist unit, which is mounted immediately in front of the operator, consists of an inclosed motor and electric brake. The motor drives a single-grooved drum through a bevel and worm gear reduction inclosed in an oil-filled housing. This drum winds a ¾-in. plow-steel cable. The cable passes over a sheave at the top of the elevator uprights to the traveling elevator head, which is provided with special attachments to support the load. The elevator head is guided by four rollers running inside the upright channels. The hoist motor is operated through a controller at the right of the driver's seat.

### Electric Screwdriver Revolves Only When Pressure Is Applied

A portable electric screwdriver and an automatic lag-screw driver, a feature of which is an automatic overload safety device which shuts off the current when the motor runs beyond its rated capacity, preventing damage to the motor, have been placed on the market by the John Steptoe Co., Cincinnati. These tools are part of the line formerly built by the Automatic Electrical Co., Cincinnati, the manufacturing and selling rights of which the Steptoe company has recently acquired.

The electric screwdriver weighs only 5 lb. and may be held in one hand while inserting or removing screws, the other hand being free to hold the work in position. It is claimed that No. 16 screws 3 in. long may be driven into hard yellow pine without first drilling a hole. By placing a bit on both sides the tool may be used for driving or withdrawing screws. The tool runs at 250 r.p.m., and is arranged so that it will not revolve until the bit is placed in the screw slot and a downward pressure applied that engages the positive driving clutch. Although the aluminum pistol grip is provided as regular equipment, it readily may be removed.

The motor, which is of special design, runs at 10,000 r.p.m., and is reduced to the spindle speed through a gear and worm drive. The motor is air-cooled



**Power Screw Driver**

Even the screw driver has had to be electrically driven. The tool that turns the trick weighs only 5 lb. and can be held in one hand.

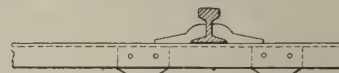
by a fan, which is machined from a heavy bronze casting. Ball bearings are employed for the armature and gear shafts. The casing is of aluminum. An automatic overload safety device is provided as part of the regular equipment. The conductor cord is reinforced at the machine with heavy rubber hose and is attached to a terminal block, to prevent strain on the motor by pull on the cord.

The machine is rated to drive any size screw that can be driven by a hand brace. The automatic lag-screw driver may be used to advantage in putting up countershafts and in lagging machines to platforms. This machine weighs 30 lb.

### Mine Tie That Resists Creep

Inasmuch as transportation is an important part of coal production it is not strange that many improvements in track construction and materials should originate at the mines. Metallic ties have long been known and used both for mine and railroad tracks. One of the chief disadvantages of such ties, however, has been their comparatively slight hold on the roadbed and their consequent tendency to creep.

In order to obviate this difficulty, William M. Riggins, of Lynch, Ky., has devised the tie shown in the accompanying illustration and for which application for letters patent has been made. As may be seen from this drawing this tie does not differ materially from other devices of like nature except that at each side of each rail a plate or anti-creeper is secured to the sides of the tie. This plate is so formed that it forces its way downward into the roadbed and resists whatever tendency toward creep may be developed by the action of the locomotives and trips that pass over the track.



**Lest the Ties Bunch**

Like creepers on one's shoes are the creepers on Mr. Riggins' steel tie, only one assists and the other resists creeping.

### Said to Treble the Life of Woven-Wire Fencing

A new process of galvanizing that trebles the life of woven-wire fence has been announced by the Page Steel & Wire Co., of Bridgeport, Conn. The new method is called "galvanizing after weaving." A protecting coat of zinc five times heavier than that on ordinary galvanized fence is applied to the fabricated wire. Formerly the wire of which fence was made was first galvanized and then woven into fence and, as many mechanical operations were performed, the thickness of the zinc coating was definitely limited.

In the "galvanizing after weaving" method, the mechanical operations are all performed first, and the fabric is then galvanized, thus permitting the application of a "super-heavy" coating of zinc. In service tests, wire bearing the thickness of coating that is applied by the new method has successfully withstood exposure in New England for more than seven years.



# COAL AGE

McGraw-Hill Company, Inc.  
James H. McGraw, *President*  
E. J. Mehren, *Vice-President*

Devoted to the Operating, Technical and Business  
Problems of the Coal-Mining Industry

R. Dawson Hall  
*Engineering Editor*

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Number 5

## Functioning Badly

**W** E COAL MEN are in grave danger of being thrust from our long held place as the worst functioning industry. The U. S. Department of Commerce has published a summary of the report and recommendations of the committee appointed by the President's Conference on Unemployment. It has to do with seasonal operation in the construction industries. "The committee reports," says Mr. Hoover in a preface, "that building trades workers in most American cities are employed less than three-quarters of a year. As a result the trades are fully employed for only three to five months." At that we are not sure that the palm for bad functioning rests with the construction industry. It has some close rivals, and there are some industries that do not even attempt to rival it in its inactivity, but these are so casual that they are not held to account.

## Who Are Your Favorites?

**E** VERY MANAGER has his favorites—the men he believes assist him most greatly in getting out cheap and good coal, but unless he has a close record of performances, a knowledge of actual and proper unit costs, he is liable to be led astray by a glib tongue, a confident manner and personal preferences. Most managers do not know enough about what are proper costs and what are actual costs at any mines for them to form any correct judgment.

In consequence they do not know to whom to award praise, to whom to give an increase of salary, whom to keep and whom to let out. Furthermore the company officials knowing that honor is not weighed in the balance, that salaries are based on guesswork, that jobs are dependent on mere prejudice resent such unfair management. But if accomplishment is measured carefully, if costs are matters of general knowledge, the subordinate company officials know that a verdict based on both can, and probably will, be fair and that satisfactory work will be appreciated. They will be explaining when the results are bad and will not wait to be requested to explain. They will recognize the trend of costs as soon as the manager.

## Shifting Fans

**A** PROFITABLE economy in mining is to shift fans from plant to plant to suit the conditions at the various mines. As the workings develop, the equivalent orifice of the mine changes, and the fan will not work economically if that factor of the mine is not equal to the same factor of the fan. Of course, no mine retains for long an equivalent orifice that suits the fan, but there is no economy in continuing to operate ventilating equipment the equivalent orifice of which is greatly different from that of the mine. As the workings get

larger they need another fan and also, in their declining days, as they get smaller they need a fan giving a lower water gage. By shifting fans each mine can get the ventilating unit it needs. It is a job requiring an expert to make the appropriate changes, and an expert is needed to determine just when a change would be economical and when the cost of the change would be less than the economy effected by it. But the relocation of fans affords a possibility of economy not to be overlooked. Where a company has few mines it will be necessary to buy new fans and perhaps to sell the old ones, and even large companies with many mines may find that practice advisable.

So little do some people, who should know better, understand ventilation that they are disposed to criticize a fan because it fails to get as good results when the mine is large as it did in the earlier days when the mine was small. Moreover, there are men to be found who would like to get twice as much air in a mine without a change in the water gage, which is obviously impossible, for the quantity of air the mine will pass varies with the square root of the pressure placed upon it.

## Find a Place for Your Slack

**F**INE coal will continue to be sold at lower prices than lump coal, till place is found for all the slack mined and operators have to crush part of their product. Consequently, operators should bestir themselves to show the advantages of using fine coal in boiler plants. It is advantageous and the public should know it. Instead of lamenting the low cost of slack, bituminous operators should actively promote its use, as the anthracite companies have been promoting the sale of buckwheat.

This is a problem of salesmanship which should be impressed on every man who comes in contact with the backwoods, backward consumer who is still burning run-of-mine under boilers. The railroads should be urged to use stoker-fired equipment, and the domestic consumer should be recommended to use smaller coal, instead of buying lumps and reducing them to dust with a hammer. We all need to be told. Rapid progress is never made unless someone is prepared to deliver the message of better methods and lower costs.

Why leave this to the boiler salesman who does not meet the consumer till the consumer calls him in? If the boiler company's representative tried to sell the better equipment his word would be discounted as a too greatly interested party. In fact the average consumer of mine run never meets the maker of stoker-fired equipment, the maker of the better boilers not being engaged in the selling of the cheaper, less economical types. The salesman of coal can sell the idea better than almost anyone else as he is actually advising that his client buy less and cheaper coal. The boiler man



would be recommending his customer to spend more for boilers than the customer desired and, usually, to scrap the old boilers to buy of him the equipment he advocated. Attacking from that unfortunate angle he could not hope to overcome the buyer's resistance.

### Another—and a Better—World

CARLISLE SPEDDING, a young man about to be put in charge of certain Whitehaven collieries at the beginning of the last century, took a trip to Newcastle-on-Tyne to see how the mines were being operated in the Northumberland collieries. Probably he had economic purposes in view and went principally to find out how to make the Cumberland collieries profitable, but he was nevertheless quite largely interested in safety, as is evidenced by his later introduction of the practice of "coursing," or as we would say, circulating the air through the mine workings.

He also invented the "Spedding Steel Mill" by which in those days, before the introduction of safety lamps, it became customary to light gaseous mines. He learned that a spark produced by friction would not ignite gas, and by revolving a steel wheel against flint he was enabled to obtain a steady stream of sparks that would illuminate, even if uncertainly, the face at which the miner was working, the methane being too slow in combustion to be ignited by so fleeting a source of heat.

But whatever the purpose of his visit, this is true: He had to disguise himself as a miner to get an opportunity to visit the mines, so closely did the owners of one property hold their secrets from the employees of the owners of another though in the same country.

Today we may note with pleasure the World Power Conference held by the same nation with scientists of all the civilized world present and with the notables of that country welcoming the visitors and all contributing freely to that congress the facts regarding their methods of operation. The world indeed has changed—and for the better. Those who doubt that fact kindly take notice. A little more than a century ago, the world in general kept its manufacturing methods so secret that enterprising Englishmen went abroad as workmen to learn what was being done in foreign countries. It will be recalled how many years earlier one of them, Richard Foley, disguised as a fiddler, seeking work, with infinite patience and no little hardships, obtained the secret of the nail-splitting machine then in use only in Sweden. English manufacturers were at that time, at least, equally secretive.

The World Power Conference is only one of many straws showing how the world is changing. Men are more and more traveling, not alone for pleasure and profit of the mind but to learn how to conduct their business. Ideas are no longer buried in one man's mind to die with him. They fructify in every country; they bear seed the world over. The greatest gift that any man can give is not a library of dead books, of histories or of manuscripts that describe the past, but the records of his own contribution to human progress, the new methods that have sprung from his experience, the ideas that his own brain has evolved. The libraries are well, but the record of modern practices is even better and, best of all, even a man of small means often can in this way serve the public better than the man of millions.

### A Superiority Complex

IT IS A SAD commentary upon unionism that most of the local unauthorized strikes occur in the strongest union fields. The latest exhibit worthy of note was the strike at the new Orient No. 2 mine in southern Illinois where union officials had just negotiated a new scale for loading-machine operators. A strike occurred at once. It wasn't a strike of loading-machine men, but of men running coal cutters. The agreement, which had just been written, provided that these men should receive the union scale of thirteen cents a ton and that until scales were installed at the mine, their method of checking coal should be left to the machine men involved and the management. But when the men could not readily fix with the mine superintendent upon a method of payment, they struck. Naturally the company insisted that they go back to work and then take up the case under the contract. It was simply another instance of unauthorized striking.

A probable reason for this strike is that the men had been working steadily developing the mine for a considerable period in spite of the fact that fishing was pretty good. But such a strike could hardly have occurred, no matter how powerful the lure of the cat-fish, had it not been for the union state of mind. In Illinois, the union's strength these many years has produced a superiority complex in the minds of the men. This attitude is infrequently seen during times like these, but it still is likely to crop out in men who have been eating three square meals a day and who ride back and forth to work in automobiles of their own. They forget that they have pledged themselves to keep the mine running and settle disputes by peaceful methods. They forget that they are pledged, as union men to support the policies their leaders determine. They are spoiled by the very strength of their union.

Now that unionism is in distress everywhere, there is ample reason for President Lewis to campaign the fields he still holds, declaring in no uncertain terms that the very life of the union depends upon union men living up to their contracts. Said he in Iowa: "There devolves upon your union the same degree of obligation that exists in the making of a contract between two men. . . . If a man in some business transaction violate his word to you once, twice, thrice, you arrive at a point where you no longer deal with him because of loss of confidence. . . . You members of this organization will understand that when officers of your union ask you to carry out your wage agreements they are doing so to protect your own record as an organization. The existence of the United Mine Workers of America must be justified if it is going to exist."

These are no longer hollow words. They used to pass the union miner by without affecting him emotionally beyond tickling his risibilities slightly. Now they send a shiver down into his stomach. It is an unpleasant shiver. The union miner doesn't thank anybody for stimulating that sensation within him. But he has got to experience it for the good of the industry. It takes a good leader to go about the unionized fields giving it to him without disrupting the union in the process. President Lewis is that kind of a leader. So we rise once more to hope that Mr. Lewis will stick to his job even though the health of President Gompers of the American Federation of Labor is again reported to be frail.





A Stripping Shovel and Car-Haul Incline

## Getting More Work from a Stripping Shovel

Long-Reach Stripping Shovels Are Slow in Operation—  
By Providing a Separate Machine to Waste the Spoil the  
Capacity of a Small Shovel May Be Greatly Increased

BY ALPHONSE F. BROSKY

Assistant Editor, *Coal Age*  
Pittsburgh, Pa.

**M**ACHINE stripping, from its humble beginning fifty years ago, when a cover 15 ft. in thickness was considered a mountain, has been developed to such an extent that uncovering coal 60 ft. below the surface soon will be commonplace. In all this progress importance should be attached to the development of equipment rather than to the actual methods of stripping. It is the equipment and its performance that determine the economical limits of any stripping operation.

The biggest of present-day shovels will uncover coal at depths of as much as 60 ft. below the surface. This may perhaps be done at a profit if the market is favorable, but in all probability some other form of equipment could be used that would reduce the operating cost. There is a practical limit to the size of the shovels that can be used for stripping coal. Increased capacity and reach entail increased weight which tends to crush the coal bench on which the shovel travels. These large shovels also can be manipulated only with a large labor force and at the expenditure of more power. The capacity of a shovel for work is not proportional to the length of its reach, and its efficiency, theoretically, decreases as its size is increased.

Thousands of acres of coal lie under a cover that is only slightly thicker than that which heretofore has been stripped by shovels. Coal thus protected by heavy cover, is more merchantable than that from shallow stripping and should find a ready sale, especially if the bed is advantageously located with respect to its natural market. Under such circumstances the ratio of thickness of cover to thickness of coal which in the

standard practice of the past in the northern coal fields has been fixed at six to one, might be expected to increase if the coal is buried under an overburden not exceeding 60 ft. Purer coal and reduced cost of stripping might be instrumental in making the ratio as high as 10 to 1. Thus the stripping of a 6-ft. bed under 60 ft. of cover might be entirely feasible.

### COMBINATION OF SHOVEL AND BELT FAILED

Back in 1904 George E. Turner built a stripping machine near Missionfield, Ill., incorporating in its construction a long conveyor boom and a short-boom shovel. Both of these devices were mounted on a single truck and functioned and operated as a unit. Later on the shovel attachment was removed from the conveyor truck and its place taken by an independent steam shovel. Two units were thus provided which acted independently of each other. As recounted by Grant Holmes in an article entitled "Early Coal Stripping Full of Heartbreak," published in the June 5 issue of *Coal Age*, the conveyor machine was "a theoretical success but a practical failure." The belt had to be replaced frequently and various other parts constantly were breaking. This experiment apparently blasted the hopes of stripping men so far as the belt conveyor for carrying heterogeneous materials, such as a mixture of clay, shale and slate, from the pit to the spoil bank, was concerned. Consequently up to the present few attempts have been made to apply conveyor belts to the disposition of stripped material.

In 1915 the Dobbie Foundry & Machinery Co., of Niagara Falls, New York, built a portable incline to handle two solid-body cars or skips which are filled with spoil by a small stripping shovel. Each skip is then drawn separately by a hoist and rope to the top of the incline, where it enters a dump and is tipped

NOTE—Naturally a small shovel can work faster than a big one. By employing an incline to dispose of the spoil as shown in the headpiece the shovel can be kept steadily at work digging overburden. Each machine thus does only the work for which it was designed and together they can dig and waste as much overburden as could a far larger shovel alone.



forward on its front wheels, discharging its contents onto the spoil bank below. The purpose of the Dobbie portable incline and the Turner conveyor are identical, both serving to carry the overburden from a small stripping shovel to a waste bank. The construction of the Dobbie portable incline, however, is quite unlike that of the Turner machine and overcomes the objectionable features that were responsible for the failure of the latter.

As shown in the accompanying illustrations the frame of this incline is in reality a cantilever truss made up of I-beams, angles, channels and plates which is tied to a bedframe of H-beams. This bedframe rests on four railroad trucks set in pairs on a wide double track to prevent rocking. The incline on a slope of 18 deg. is 173 ft. long over all and has a rise of 64 ft. from the top of the track rail to the tip of the truss. The dump is so located as to permit the building of a spoil pile 52 ft. high, with its vertex 150 ft. horizontally from the bucket of the stripping shovel. The long overhang of structural steel which projects toward

into the dump, the front wheels remain on the track while the auxiliary wheels on the rear axle follow the elevating rails, swinging the car into an almost vertical position about the front axle as an axis. These details are shown clearly in Fig. 3.

The Dobbie portable incline has been used successfully for nine years at the limestone quarry of the Diamond Portland Cement Co., Middle Branch, Ohio, in conjunction with a steam shovel for stripping overburden preparatory to quarrying operations. The limestone formation worked at this quarry is the Putnam Hill bed. It attains a thickness of 8 to 10 ft., is underlaid by the No. 4 coal seam and covered by sandy loam, clay and slate. The average thickness of the overburden is 15 ft., the maximum being about 36 ft. Where the thickness of the cover is greater than 20 ft., shale occurs directly above the limestone. Otherwise the cover is all of a loose sandy nature.

Because the thickness of the overburden is fairly uniform, it is stripped off by parallel cuts extending across the property. The berm, or exposed bench of

FIG. 1  
Wasting Spoil

This view of the portable incline is taken from the spoil bank. It shows the simple construction of the cantilever with the car or skip dump at its upper extremity. This machine is capable of wasting as much spoil as could be dug and wasted by a giant stripping shovel. A comparatively small steam shovel in combination with this incline are thus able to do as much work as a big expensive stripper. The view which is naturally foreshortened shows the incline out of proportion. The headpiece gives a better idea of the relative sizes.



and above the waste pile is counterweighted by a reinforced-concrete block cast on the bedframe of the incline.

On this incline two tracks are laid. Each consists of 60-lb. rails on an 84-in. track gage. On each track runs a 5-cu.yd. solid-body car which is pulled up and lowered down the incline by a 1½-in. steel rope, guided by sheaves and securely attached to the car.

Each car is raised and lowered independently by its own cylindrical hoist drum. These two drums are driven in tandem through a train of gears by a 100-hp. 440-volt induction motor, which also is geared to a small slow-motion drum for propelling the incline. The entire machine is moved by a snatch block and cable.

In the dump section of the incline the car track proper is horizontal. On each side of it at the dumping point, however, are placed elevating rails which engage a pair of wheels on the rear axle of the car outside of the regular track wheels. As the rope pulls the car

limestone, between the stripping and loading shovels is about 85 ft. wide. Approximately 60 ft. of this width is occupied by the carriage and short overhang of the incline, the remaining 25 ft. representing the width of cut made by the stripping shovel. The rock or quarrying shovel, which follows the stripper at a distance of 400 to 500 ft., naturally, handles a cut of limestone no wider than the stripping cut. On reaching the end of a cut, the stripper "runs back light" to the point of starting, each successive cut being made in the same direction.

Several reasons that justify "running back light" and making all cuts in one direction might be given. Chief of these, however, is the necessity for keeping the stripping and loading shovels some distance apart in order to maintain a reserve of exposed limestone in front of the loading shovel. This intervening distance between shovels must be maintained also in order to keep the incline out of the blasting zone. The difficulty encountered in maneuvering the incline—that is, in





Fig. 2—Loading a Car on the Incline

Solid-body cars are used on this incline. Each car holds about two dippers full of spoil and makes one trip to every four dips of the shovel.

turning it—demands that it be “moved back light.” If the incline were mounted on caterpillars, it would be more portable and obviously the necessity for “moving back light” would be removed.

The stripping shovel, is an old machine having a swing of only 180 deg. It is operated by steam and has a  $2\frac{1}{2}$ -cu.yd. dipper. Being of the railroad type, much time is lost in moving up after each “bite,” as well as in striking the bank several times in order to fill the dipper. Much of this time could be saved through the use of a caterpillar-mounted shovel.

Inasmuch as the quarry practically adjoins the company's cement plant an alternating-current transmission line is carried to the strip pit. As was stated earlier in this article, the incline is electrically driven. So is also the rock shovel which has a  $1\frac{1}{2}$ -cu.yd. dipper. The incoming alternating current of 440 volts is converted to direct current of 220 volts by a motor-generator set mounted directly on the shovel. A portable compressor unit which supplies air for drilling blast holes is also electrically driven.

The  $2\frac{1}{2}$ -cu.yd. stripping shovel and the portable incline have about the same capacity when working with fairly heavy cover. This outfit has successfully stripped overburden as thick as 36 ft. Although the shovel boom is not long enough to reach the top of a bank of this height, it successfully handles heavy overburden by undermining and caving. It is believed that the incline is capable of handling cover 40 ft. thick. Larger inclines of course could be built to handle still heavier covers. Where shale occurs it is usually blasted.

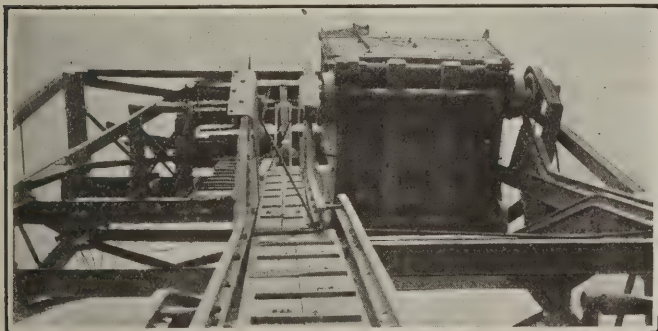


Fig. 3—Car Tilted Into Dumping Position

The dumping arrangements are extremely simple. The front wheels of the car follow a level track while the auxiliary wheels on the rear axle rise upon auxiliary inclined rails. By this means the car is up-ended to practically a vertical position.

When working in cover 35 ft. thick, this incline has handled 2,900 cu.yd. of shale and loose sandy material in 10 hr. Under extremely favorable conditions, it has transported to the dump as much as 185 cu.yd. in 13 min.

The number of men required to operate and move the stripping shovel and the incline depends upon the thickness of the cover being stripped. When working in light cover the labor charge per ton of material handled is comparatively high because the equipment must be moved up frequently. Where the cover is about 20 ft. thick eleven men comprise the stripping crew. Three of these operate the shovel, one attends the incline while the remaining seven lay track and perform the other duties incident to moving the shovel and incline.

This company is preparing to open a new limestone quarry not far from the nearly-depleted one now being worked. It has made a thorough examination of the property. Test holes show that the average thickness of the cover is about 20 ft., and that the overburden consists almost entirely of loose, sandy material. It is the intention, therefore, to strip with an electric shovel which will deposit the spoil material on a portable incline conveyor.

#### RUBBER CONVEYOR BELT WILL SUPPLANT SKIPS

On this latter piece of equipment a 2-ft. rubber belt will be utilized in place of cars for carrying the spoil to the top of the incline. The shovel will deposit the

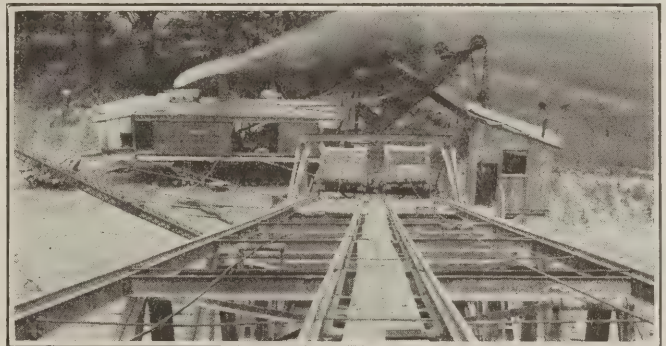


Fig. 4—Looking Down Incline Toward Shovel

There is nothing complicated about this equipment. The cables attached to the cars are led around sheaves at the top of the truss and thence beneath it to the tandem drums of the electric hoist.

stripped material in a small bin which will be covered by a grizzly to keep out large pieces that are liable to choke the throat of the bin. A steel-pan conveyor feeder will regulate the flow of spoil material from the bin to the rubber belt which will be housed in a gallery. The belt will be driven by a 20-hp. and the incline propelled by a 50-hp. motor. Both shovel and incline will be mounted on caterpillar trucks.

Though the reach of the cantilever truss on the conveyor incline will be equal to that of the car incline now in use, it need not be so heavy. The live load on the car incline is about 20,000 lb., and exerts its greatest force during the dumping of the car at the end of the cantilever. The overhang of the truss, on both car and conveyor inclines is about 100 ft. A 2-ft. belt will carry about 25 lb. of load per linear foot or a total of 2,500 lb. The conveyor also eliminates the stresses which are set up by the impact in dumping a car.

It is believed that the conveyor incline mounted on caterpillars, together with a  $1\frac{1}{2}$ -cu.yd. full-revolving





Fig. 5—Moving the Incline Forward

In order to keep the incline alongside the shovel it must be moved up periodically. This is done by means of a cable that is wound onto a small drum on the car hoist. A dead man or multiple-stake anchor forms an ample fastening for the snatch block.

electric shovel, similarly mounted, will handle as much material as the largest type of shovel now in general use. The stripping shovel will have a radius of 33 ft. at an elevation of 8 ft. Not only is this lighter equipment expected to handle as much material as a giant shovel, but it can be operated with one-third the labor or perhaps even less. It is reasonably certain that four men will be able to perform all the duties incident to the operation and movement of both the shovel and the conveyor incline.

In the stripping of coal the Dobbie incline should

find many applications. Experience gained in several industries in handling a mixture consisting of exceedingly small-, and large-sized pieces precludes the utilization of rubber-belt conveyors. If the rubber-belt or steel-pan cannot be made to work satisfactorily reliance must be placed on a car-haul arrangement on an incline, the success of which has been convincingly demonstrated by nine years of service in the Middle Branch limestone quarry. In any event, the incline and also the shovels will probably work to best advantage when mounted on caterpillars. It seems likely that coal strippers have neglected a feasible piece of equipment that advantageously might be employed in stripping coal under cover ranging from 20 to 60 ft. in thickness.

Possibly the Dobbie portable incline, with a 100-ft. cantilever truss and 5-cu.yd. cars, working in conjunction with a small stripping shovel, might not handle as much material per shift as a machine with a 90-ft. boom and a 6-cu.yd. dipper; nevertheless, in the final analysis the combination of two small machines has several merits to recommend its use. The investment in a portable electric incline and a small electric shovel, both mounted on caterpillar trucks, is less than half that necessary for an electric shovel of a size sufficient to do the same work as the former equipment. It is believed by some that shovels weighing as much as 300 tons some day will be mounted successfully on caterpillars. Thus, far, however, this feat has not been accomplished, and until it is the comparatively light portable incline mounted on caterpillars, can be moved readily along the berm, thereby eliminating much lost time and considerable labor.

## The Miner's Torch

### On Regulating King Coal

"OLD King Coal, was a jolly old soul!"  
Perhaps he was but he isn't now.

Everyone is agreed that he has no soul and furthermore he needs a super-king or something of the sort to make him behave. The only reason that he has not already been put under surveillance is that no two people can agree as to just how a super-king should act, in fact I rather think if the truth were known that they don't exactly know what a super-king is.

First, Congress as a body tried to visualize the Super-King myth; that got the President interested. The President appointed a Commission and they got interested. The Commission formulated a voluminous report which they gave out in installments and each installment interested an editor or two; by the time all of the installments reach the daylight of publicity all of the editors in the country will probably have become interested. Now, to make matters worse, some of our Congressmen have decided that their first guess was wrong so they are beginning all over again, armed with the information and suggestions brought out by the President's Commission and the newspaper editors who commented on the Commission's report.

It will take at least another year before all of the editors and the politicians who have become interested will have had a chance to talk and write themselves out;

and in the meantime what will happen, in fact, has already happened? Only this:—One can buy all of the coal that one wants at a fair price and the quality is satisfactory. When this information becomes generally known the editors and the politicians will lose interest in King Coal and his dominions.

So far as I can discover no one is entitled to credit for bringing about these improved conditions in the coal industry. They are simply and wholly the result of circumstances beyond the control of kings and super-kings, to say nothing of politicians.

The miner who loaded dirty coal has had a change of heart because he knows that there are plenty of men ready to take his place if he is discharged. The operator who has been loading washer refuse and calling it coal has gone out of business because mines producing coal with a reputation as to quality are only running three and four days a week. The broker who made a practice of watching the coal cars in the railroad yards so that he might boost prices whenever a shortage was in prospect has given up in disgust and changed his line of endeavor. And as for price of coal, it is, of course, higher than it was in pre-war days but it is so near to the actual mine cost that only the best equipped mines are now being operated on a profitable basis. Even the United Mine Workers have seen the light and have postponed indefinitely the next strike.

So long as the erstwhile King Coal is a pauper and furnishes all the coal the public wants he will be forgotten, but as soon as the market changes and Coal is once more King the public will dig up its wise saws about the eternal need that the producers of essentials serve the public at minimum profit and in adequate quantity without recoupment of losses.



# Should Mines Be Subjected to a Yearly Valuation?

As the Probable Life of a Mine Changes with Development, as Market Requirements and Conditions Modify Profits and as Such Changes Demand Operating and Financial Reconstructions, Frequent Revaluations Are Desirable

BY C. P. MCCORMACK

Consulting Mining Engineer, Crowell & Murray, Cleveland, Ohio

**C**OAL, metal or non-metallic mines—it makes no difference—all are hazardous and swayed by the same gods of chance. Good business demands that all the knowledge and control possible be applied to the gamble that underlies such operations.

Whether operations were initiated under a fully detailed layout carried to the point of exhaustion or just a vague development scheme, upsetting agents are liable to enter year by year. Thus a continual investigation and readjustment is necessary to assure of an ultimate profitable conclusion. An annual survey of the entire mine is the check that will determine if ultimate success is assured.

All mines need a revaluation—a research to ascertain if their discounted worth is what it was at their last inventory less the extracted profits to date. This valuation, each time, should consider the mine as a new property, using the past operation as a guide.

Such a survey is a forecast of succeeding operations. Then, if the previous planning does not fit in with this forecast of the final result it should be altered. Changes in the occurrence of mineral, changes in methods, equipment, labor, geological controls, grades of product, markets and economics are some of the factors that influence the new forecast and scrap those made in the past. On the other hand the operations should not be revised unadvisedly as a well-engineered initial plan will terminate more successfully if not tampered with or subjected to continual alteration. But an investigation of the mine in its entirety is the only way to check up these plans or the governing factors. This applies even more forcibly to enterprises the managements of which at starting did not attempt to construct a definite program.

Mines with a production of 3,000 tons per day and upward, whether run singly or in groups, are as vulnerable to these conditions as the little 200-tonner. In fact, more so, as their far-flung workings are more liable to run out of bounds than the easily overseen small operation. The large corporations with technical staffs employ them chiefly on the going production as this department is seldom overmanned. And in addition these technicians are often blocked by historic methods and the "practical man." But without a comprehensive look into the future that same great smooth running plant ultimately may tangle itself into a Gordian knot.

Small mines with only the fatherly hand of the operating man, intent on costs and the myriad daily details to direct its destiny are in dire need of this valuation. With no compensating operation to tide it over, many a constricted mine had much better shut up shop now if the future is all guesswork. Whether the company is large or small and has, or fails to have, its own experts, an outsider's viewpoint is likely to be enlightening as prejudice in favor of their past plans may warp the judgment of the company's engineers. The future may be held only too readily to fit into the past.

Few other industries fail to have periodical analyses made of their resources, producing conditions and prospects. Accountants are called in, inventories are taken, markets are investigated, adjustments are made for the trend of the times and the future is planned anew. Yet these businesses have known reserves and have a growing life. All the more reason then why a mine with its wasting assets should try in every way to safeguard its limited existence and apply all the certainties possible to its hazards.

A mine valuation may have many forms and be carried into wondrous detail according to the proclivities of the examining engineer and the demands of the client. But boiled down, a report should show the ultimate earnings and the present worth derived from a discounting of these profits.

To discover the ultimate earnings, the following main facts should be ascertained: (1) Reserves to date segregated into known, probable and possible tonnages, (2) sampling and grade of tonnage, (3) condition of the mine and plant, (4) possible yearly production, (5) costs, values and expected profits, deduced from operating plans and life and taken over a certain average period.

The present worth, which is the indicator and final figure for comparison, is derived as follows: (1) Operating plans based on reserves, grade and condition of the mine are devised or revamped or approved; (2) life of mine is ascertained from operating plans and in consideration of markets and desired financial return; (3) ultimate earnings are discounted over the derived life and based on desired financial returns, which give the amortization and the return on the investment, and thus determine the present worth. This is the climax of the story telling how profitable the operation

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**E**ACH MINE when opened should have some definite plan, not alone as to its engineering but also as to its financial future. On its projected life depend its present worth and the expenditures that may be profitably made in its development. As the mine is operated a clearer idea is obtained as to its mineral resources, as to the percentage of mineral that can be extracted, as to cost of production and the market price of the product. Many changes occur that make a revision of former estimates necessary. Are these revisions made? Mr. McCormack says they are not. In his belief they should be made yearly.

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really is and how it compares with past ideas or what could be earned in other industries with same investment and risks.

The examining engineer in his field work accumulates the data on the reserves, grade and condition, paying due consideration to exploration, development and geological factors and to adjoining operations and history of the district. The balance of the items are gained from a study of the field data. All or a portion of this information may or may not have been obtained on the mining property before it was developed. If never procured no operation of the property should have been considered. If once possessed and never rechecked, then the enterprise is sailing on an uncharted sea with only a lucky star for a compass.

As has been said before, a valuation is a forecast

and as no forecast can be absolute—as it is humanly impossible to look into untouched formations or foretell exactly the economics of years hence—then the more often a forecast is made the closer it approaches the truth. In a thirty-year life how much more accurate is the forecast made in the fifteenth or seventeenth year of what will happen on the twenty-seventh year than is the valuation of the fourth

year. It is certain that any capital asked to invest in a mining operation will demand the value on the date of that request and no other. Therefore as the operator's money is of the same worth as the capitalist's, it is equally befitting that he know to the same degree just where his property stands.

Even in the short interval of a year many changes may occur to crystallize the future for the property. Taking the main features of the report, as itemized above, into consideration the following are some of the influences constantly at work which will affect the welfare and profoundly modify the ultimate end of the venture:

(1) Knowledge of the deposit newly acquired from work at adjoining operations, from the development of the district or from the developments of the mine itself may change tonnages from probable into possible or may raise or lower the total reserves. As these are the primary assets of the company, any change in their totals is of vital importance. Simply deducting each year's production from an original estimate is by far too inexact a method in view of the yearly depletion of the known resources leaving the less definitely developed reserves as the sole resource of the future.

(2) Original geological inferences now may be so incorrect as to reapportion the probable and possible tonnages. As all mines at birth are regarded optimistically with reference to these estimated blocks, their alterations become serious.

(3) Explorations and developments recently completed should call for a revaluation because, whether they verify the original calculations or disprove them, a new basis for evaluation is created.

(4) Resampling may alter the expected grades and, in conjunction with new treatments, markets and eco-

nomics of the industry, this changing of grades or consequent value is tremendously important. It is emphasized here that, if the mineral is closely and expertly sampled continuously and the information is kept plotted on analyses maps, the present and future condition of the mine will be judged with a greater degree of certainty.

(5) Pushing of one part of the initially planned harmonious operation ahead of another may breed difficulty later on. This calls for prompt rectification despite the fact that apparently the work may be progressing smoothly.

(6) Gouging of low-cost tonnage or "high-grading" may have skimmed the cream needed later on. The down-grade returns after the peak of the life are thus aggravated, and now is the time to ascertain if the

candle is burning at both ends.

(7) The plant may be found to be too small for coming yearly production based on new market or reserve conditions. Hence a fresh investment is demanded, and a valuation shows what change in present worth this would occasion.

(8) Or the plant may be found to be so oversized that production should be speeded up to utilize its

capacity economically, thus shortening the life and putting a new value on the discounted earnings.

(9) If the workings are so spread out that co-ordinated supervision has become difficult, the condition of the mine may have become so involved—yet unheeded—that larger losses ultimately will be sustained and the earnings will be decreased.

(10) New equipment or methods may now be successfully installed, with consideration of other factors, that will give better results. Or they may be thought ready to install when in reality the final conclusion does not justify them. Only a survey gathering all the parts together can prove this.

(11) Labor demands or man productivity are constantly changing and calling for other means to accomplish the desired results than those once thought adequate. How best obtained can only be ascertained from a detailed investigation as labor is the major consideration in every phase of the operation.

(12) Redetermined values and costs may differ so radically from those of the last valuation that the new figures will be astounding. The fair average period basis of one or two years ago may now be seen to be wholly wrong. As costs are fully as important as values, and more fluctuating, the expected earnings hinge on this more than on any other of the factors.

(13) Operating plans may be found to be incapable of producing the required tonnage and thus require alteration. A comprehensive survey will show whether other plans will be justified at higher cost but larger tonnage; or just what the ultimate cost of the new plans will be. If not warranted, then the life must be lengthened and the present worth decreased for the same reserves.

(14) Appreciable requisitioned expenditures are only

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**N**O CAPITALIST would invest money on the basis of an estimate of the value of a property made many years ago. He would want to know the value at the date of investment. Can the owner or owners of a property satisfy himself or themselves by trusting to a survey or a plan made many years ago when less was known as to the mineral resources, the capacity of the plant, the character of the market and a number of other factors, the character of which is more clearly revealed by the passage of time?

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justified by a proven increase in the ultimate earnings. An expenditure of \$100,000 on a plant or a new shaft may show a decrease in costs over a certain tonnage but it is guesswork to justify it unless there is enough surely proven tonnage that the profits will absorb the investment. Even then the proof may not be conclusive as co-ordinate operations are vital factors. Therefore a valuation of the entire operation is the only absolute guarantee that the expenditure is justified.

(15) Due to far-reaching influences and financial conditions, capital may now require other returns than it formerly did and only complete revaluation can be depended upon to devise the proper means.

It is clear that any one of the above factors or a combination of few or all are likely to be found in any mining enterprise and to be fundamentally important in determining the ultimate profits. As there is always the strong possibility that one or more of these agents will be working in various directions—sometimes unknown, sometimes unheeded—an annual valuation is a necessity. And mines have controlling peculiarities: one will be in danger of excessive costs though its reserves will furnish a safe and stable background; another's health depends on its preparation charges; the price of product raises or decreases the value of a mine which otherwise would be a world beater. In these cases too much interest may be centered on the governing trait, and a yearly valuation is needed to keep the rest of the house in order.

The following example will illustrate how even two or three of these forces, quietly acting, affect the functioning of a mine and how the survey explores and corrects to the best possible degree these conditions:

A certain mine was being worked on room-and-pillar panel system on two adjacent, steeply pitching troughing seams outcropping at surface. The main haulage-ways were being extended on the strike in 300-ft. lifts. The original exploration had been made by drilling from surface and from the outcrop and the original estimates had been based on this exploration and on the bed as already developed. The mine was opened in 1914, was put into full producing shape in 1917 and had been operated to date. Costs and prices have been assumed for purpose of illustration.

The total reserves were 10,000,000 tons which at 90 per cent recovery gave a recoverable reserve of 9,000,000 tons. The maximum production being averaged at 500,000 tons annually a plant to assure that capacity was constructed. Accordingly the property was estimated to have an eighteen year life.

Product given average value of \$6.50 per ton.....	} Average basing period 1907-1917	\$2,500,000
Product given average cost of \$5.75 per ton.....		
Net profits accordingly estimated at \$0.75 per ton.....		
Capitalization.....		

The annual net profit was figured at \$375,000 equaling 15 per cent dividend on capitalization. The amortization and capital return was figured at 4 and 10 per cent respectively, which for an eighteen year life would require a 14 per cent dividend. Thus estimated the dividend more than meets all requirements.

The total expected profits of \$6,750,000 when discounted to present worth at 4 and 10 per cent for an eighteen year life equals \$2,700,000.

During the operations of the last year, the workings up the pitch encountered numerous pinched-out areas and one end of the operation was cut off by a fault. Increased labor-and-material costs and demands of the market for closer and cleaner sizing drove costs up to \$6.25, values meanwhile rising only to \$6.85, thus leaving a net profit of \$0.60 per ton. An off-market had only absorbed 400,000 tons, leaving the schedule 100,000 tons behind. From the recoverable reserves of 9,000,000 tons had been extracted 2,400,000 tons; therefore the future reserves were thought to be 6,500,000, allowing 100,000 tons for local pinches. The remaining life of the property was estimated to be at least 13 years.

This would give the present worth of expected profit from date (still holding to original 75c. per ton profit as it was thought that the basis would return to normal) to be \$2,330,000.

Due to uneasiness on part of some of the principal stockholders, a valuation report was made which disclosed the following facts: Pinched-out areas and data on faults from this and surrounding properties

proved that seams were cut off from outcrops and displaced and that the total recoverable reserves were now only 5,500,000 tons at a 90 per cent recovery, but it was estimated that if the present operations were continued the recovery would drop to 85 per cent due to mining losses along the pinched areas and the fault. Thus the recoverable reserves would be only 5,200,000 tons. The plant was not large enough to handle more than 500,000 tons annually, therefore off-year set backs could not be made up later. These off years should be expected to occur on the average about every sixth year. The costs and prices now obtained were shown to be more nearly normal for the life of mine as the old basis would never return. This gave only a 10-year life at an output of 500,000 tons annually and an annual profit of only \$300,000 which was a 12 per cent dividend on the \$2,500,000 capitalization, whereas 19½ per cent was now required. The present worth of total expected profits was now only \$1,636,500, as compared with \$2,330,000 before.

The report showed that by certain changes in mining methods, the recovery could be raised to 93 per cent (if installed at once) giving recoverable reserves of 5,650,000 tons. By changes in plant costing \$100,000 the straight annual production could be raised to 650,000 tons with reserve capacity of 100,000 tons to make up for off years. This would cut costs to \$6.10 including depreciation on the new \$100,000 investment, thus leaving a margin of \$0.75 per ton profit or a net annual profit of \$487,500. This would be a 19½ per cent dividend on the capitalization, whereas 17 per cent would be required. The present worth of expected profits was now \$2,100,000 after allowing for interest on the \$100,000 additional plant.

Now, as the present worth of all expected profits determines the intrinsic value of a mine, a comparison



of the above various stages will show how a revaluation proved the condition and bettered it.

	Recoverable Reserves	Annual Required Per Cent	Dividend Obtained Per Cent	Present Worth
As thought to be before the valuation.....	6,500,000	14	15	\$2,330,000
As the valuation proved it to be..	5,200,000	19½	12	1,636,500
As the valuation showed it could be.....	5,650,000	17	19½	2,100,000

Much of the above discussion may be "old stuff" and proverbial to the majority of operators, but it is as true today as when first stated and yet how often are these facts overlooked. As long as the mine is safe, reserves stretch out ahead and the hoist is overtaxed now, why bother with a valuation! The insurance companies and public health boards are advocating annual physi-

cal examinations as the surest means of staving off disease. But how many men going briskly about their business have an inherent fear of voluntarily learning the truth about themselves. The theory of letting well enough alone in both men and mines is not sound business.

The engineer has a greater place in the mining industry other than in examining prospects, laying out plans and reporting for seller or buyer of properties. If he is given the periodical opportunity to pry into and lay bare the conditions of the vital organs of the mine, then proper functioning by them is assured and a full life more certain. He should be the Chinese doctor who is paid to keep his patients agoing as well as the diagnostician and physician for those stricken with maladies.

### Storage-Battery Locomotives Increase Safety in the Mines

FOR years the coal mines of the country have been seeking an ever increasing degree of safety. While the greatest danger to life and limb within the mines is unquestionably the "fall of roof or coal," nevertheless other dangers are always present, some of which may be guarded against far more effectively than can the fall.

Among these latter perils is the explosion of gas or dust—disasters which in the twinkling of an eye snuff out dozens, perhaps scores of lives. Prevention is beyond doubt the best cure for these evils. If ignition is rendered impossible propagation throughout the mine is likewise out of the question. As a palliative, however, rendering it impossible for a simple gas ignition to develop into a violent explosion, rock dusting of mine workings is being largely practiced. Nevertheless the safest mines will be those wherein all known means of preventing accidents are employed.

The accompanying illustration shows two locomotives recently installed by the Phelps Dodge Corporation in its No. 6 mine near Dawson, N. M., the photograph being furnished by W. D. Holman of that company. These machines are of the storage-battery and combination storage-battery-and-trolley type. Each is fitted with an 88-cell, 29-plate lead battery having a capacity of 480 amp. hr. The combination machine operates

when outside the mine on a trolley voltage of 260. It is provided with an automatic charging device and safety interlock. Both machines are flash-proof in every detail.

Each of these units weighs 19½ tons. They may be used either singly or coupled together. When employed in this latter way they form an articulated unit weighing 39 tons which is probably the heaviest machine of its kind used in American coal mining. Each time this unit comes to the surface the battery charge is "boosted" or "sweetened" by current from the trolley.

Of course coal mining will always be dangerous, just as is farming, railroading, fishing and many another calling. The danger involved, however, will be in approximately an inverse ratio to the precautions taken to avoid accident. While carelessness on the part of employees probably never can be entirely overcome the other factors that enter into almost every mine accident can be largely controlled. Thus while it may be impossible, for instance, to prevent men from carrying matches into the mines and surreptitiously indulging in an occasional smoke, it is entirely possible to so treat the mine with inert stone dust as to render the propagation of an explosion, which may be initiated by such carelessness or bravado out of the question. The use of flash-proof storage-battery locomotives in place of those of trolley type will do away with one of the sources of gas ignition which in the past has been a somewhat fruitful source of mine accident.



#### A Heavy Unit

These locomotives, which weigh nearly 20 tons each, may be used either independently or coupled together. When employed in this latter manner they form an articulated unit probably larger than any other used in American coal mines. The battery charge is boosted every time the machine comes to the surface and operates on the trolley.



# To Prevent Fouling, Swivel Mine-Car Hitchings Should Be Lubricated

By J. W. POWELL  
Contracting Engineer  
Welch, W. Va.

THE most important requisite of a swivel hitching is that it shall always function easily with no tendency to foul while a trip of cars is being dumped. In fact, the successful operation of a rotary dump depends in large measure upon the proper swiveling of the hitchings. I recall the experience of a large coal company that installed a rotary dump and equipped its cars with swivel hitchings, only to discover too late that they fouled so frequently that the cars had to be uncoupled before being dumped. Thus, one of the most important advantages of this type of dump was wholly lost.

Other important features of a good swivel hitching are that it should have maximum strength without excessive weight, a minimum of wear and friction, and that it should resist rust and corrosion, especially between the swivel head and its seat.

The swivel hitchings described in this article have been designed to assure these results and provide a coupling that will always function with a minimum of wear and friction, and no corrosion of the swivel head or seat as a result of the action of acids. This makes the hitching practically indestructible.

Referring to the drawings, it will be seen that the most salient feature of this hitching is the means provided for automatic lubrication of the swivel head and seat, the points of greatest wear. The swivel head in every case is completely inclosed in a metal chamber that can be packed with grease or other lubricant. This grease slowly works its way out of this container through the clearance space provided for the swivel shank, but in so doing, it thoroughly lubricates the swivel head and seat. This prevents the destructive

action of rust and acids on the metal and reduces the friction and wear to a minimum. The metal chamber protects the swivel head from injury. Its spherical shape gives maximum strength and resistance to shock, distortion and crushing.

Type A hitching is adapted to round-bumpered cars. It consists, as shown, of a hollow spherical steel casting provided with an eye to receive a link. It has one cored hole for the assembly plug and one for the swivel shank. In assembling, the link is installed in the usual manner by forging it in place after the swivel head has been formed. A thin paste of emery dust and oil or a similar abrasive is then placed in the chamber and the swivel head and seat ground together under tension.

All abrasive is then flushed out with oil after which the assembly plug is babbitted in place. The lubricant chamber is then filled and sealed with a small plug. Grinding can be omitted if desired, allowing the swivel parts to work in and seat themselves in service. In the largest size of this type of hitching, the swivel casting weighs about 7 lb. and the total weight of hitching ranges from 10 to 18 lb. depending on the distance between the coupling pins.

Type B hitching has a double swivel and is likewise adapted to round-bumpered cars. It is assembled in the same manner as Type A, but swivels somewhat more easily because of its double head. The weight of the swivel casting is about 6 lb. for the largest size, and the weight of the entire hitching is from 10 to 16 lb. depending on the distance between coupling pins.

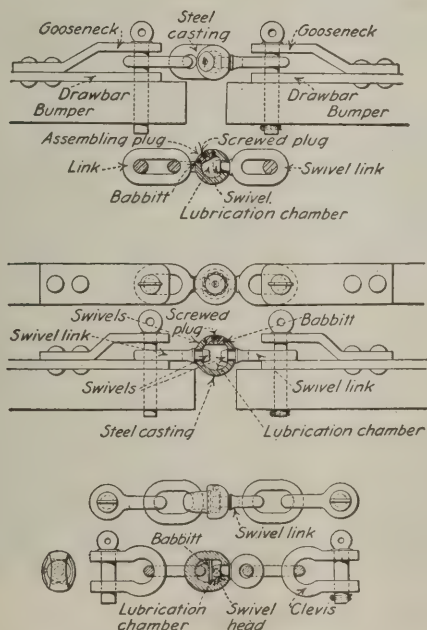
Type C hitching is adapted to square-end or double-bumpered mine cars and replaces the middle link in the plain three-link coupling. Its length has been reduced to about that of a plain link, so that the complete hitching is as flexible as that composed of three ordinary links. This has been accomplished without any sacrifice in strength or ease of swiveling. It is assembled in the same manner as types A and B. The weight of swivel in this type of hitching is about 5 lb. and the weight of the complete coupling is practically the same as that of a plain three-link hitching of a similar overall length.

The lubricating principle embodied in these hitchings could be applied to almost any type of swivel, and would prevent the rapid wear which is caused by the corrosive acids or fumes found in mines. Application has been made for patent rights. In cost and weight the couplings described will compare favorably with types embodying a swivel.

## Test Zinc Chloride as Wood Preserver

Director E. R. Weidlein of Mellon Institute of Industrial Research of the University of Pittsburgh has announced the founding of an Industrial Fellowship on the treatment of timber. This research, which is being sustained by the Grasselli Chemical Co., of Cleveland, Ohio, and is conducted by Dr. A. M. Howald, will seek the best methods of applying zinc chloride to the preservation of wood.

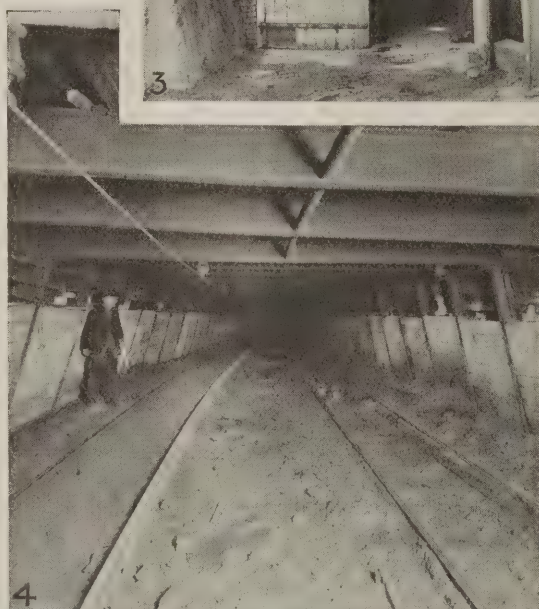
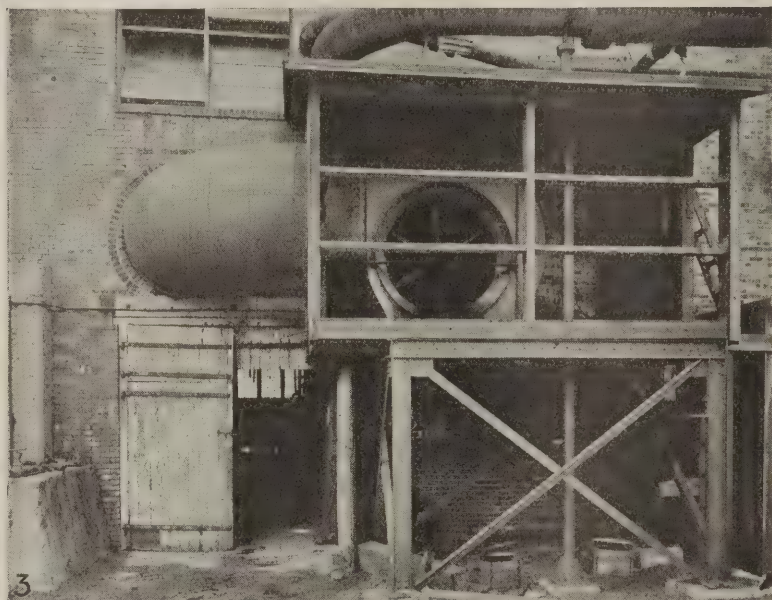
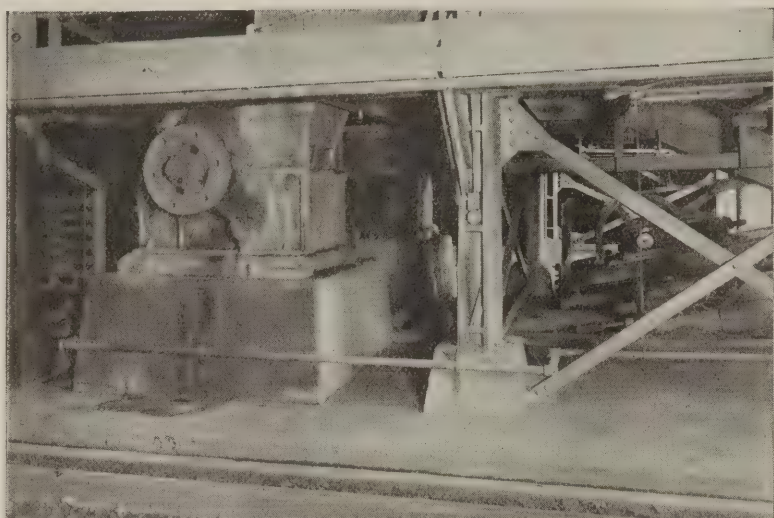
Investigational work which was begun during 1923 will be continued throughout the present year. An experimental wood-impregnating plant is maintained for practical tests of processes. Under the supervision of Dr. Howald means are being sought of increasing the permanence of zinc-chloride treatments of timber by the addition of petroleum oils.



### To Make Swivel Hitchings Turn

Three types of swivels, the top Type A, the middle Type B and the lower Type C. Type A is for round-bumpered cars and has only a single swivel. Type B has a double swivel and is also for cars with round bumpers. Type C is for square-end or double-bumpered mine cars.



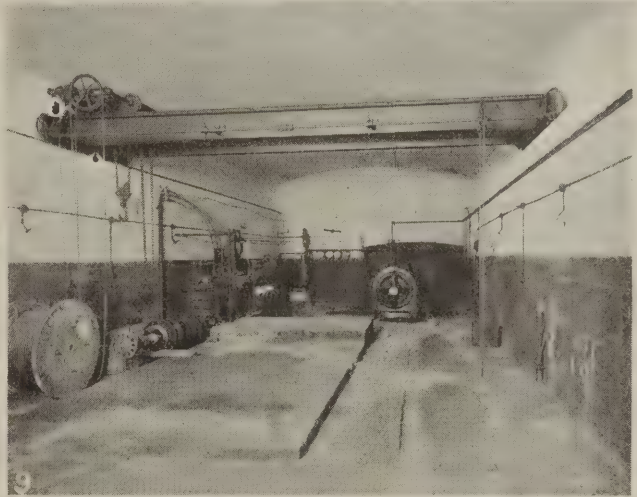


### Outstanding Scenes In and Around the Glen Alden Mines—I

(1) Crusher under the Baker breaker. This, like most of the other crushers in the same breaker, rests firmly on the ground. (2) Automatic telephone in use underground at Truesdale Colliery which saves the attendance needed at a central station and also makes it possible to avoid the delays incident to calling on "central" to make the necessary connections. (3) Fan at Nanticoke boiler-house which ventilates

the interior of the boiler-room in summer. Unventilated boiler-rooms in warm weather have temperatures comparable only to those in a ship's stokehold. (4) Efficiently steel-timbered haulway at Auchincloss Colliery. (5) Loading a car by scraper bucket at Truesdale Colliery. The scraper conveyor has made possible the operation of thin seams which otherwise could not be worked profitably.





### Outstanding Scenes In and Around the Glen Alden Mines—II

(6) Glen Alden's largest lamphouse. This building has 1,000 flame safety lamps and 800 electric cap lamps on its racks. It supplies the Loomis Colliery. (7) Automatic water still for storage-battery supply. (8) Nanticoke pump which is moved up or down according to the stage of the Susquehanna River. (9) Room at Cuyaga shaft, Storrs Colliery, built to accommodate steam pump now occupied by an electric unit.

Note the saving of space. The pump has an automatic control device designed by E. J. Falloon, hydraulic engineer of the Glen Alden. Room is about 25 x 76 ft. (10) New kind of locomotive at No. 17 Slope, Woodward Colliery, which operates on a heavy grade lowering loads and raising empties. It functions by winding in and paying out a cable. (11) Gasoline tractor hauling mine timber at Baber Colliery.



# A Direct-Current Power-Distributing System That Keeps the Mine Equipment Working

Need for Higher Operating Efficiencies Has Created a Demand for Automatic Devices — Troubles in Power Circuit Are Localized so That Serious Delays Cannot Occur

BY RAYMOND HOWEY

Electrical Field Engineer, Lehigh Valley Coal Co.,  
Mount Carmel, Pa.

IN RECENT years the many labor and mining problems have made it almost absolutely imperative for every coal-mining company to turn to the use of electrically operated machinery. As a consequence, with amazing rapidity, a vast system of electric power-distributing lines has grown which must be kept under control and be protected against delays, overloads and many forms of danger. This in turn has presented a problem of providing adequate protection for large and small power-generating and power-using machines.

Much of the old equipment used in and around the mines was originally protected by fuses. As power loads increased, more important, larger and more expensive generators, converting apparatus, transformers, feeder lines and motors were installed. The dangers attending the use of heavier currents and the importance of power delays are now greatly magnified and have made necessary the application of many different forms of protective devices and switches.

Stress of economic problems has made it more and more necessary that every saving of power operation, maintenance and labor be effected. The necessities for continuity of service, for taking advantage of diversities of loads, for intricate feeder systems, for localizing power disturbances and overloads, together with high labor and equipment costs have created a need and demand for automatic control apparatus. Consequently, during the last few years its application has increased steadily. The development of apparatus which performs a given duty more cheaply than manual operation has given great impetus to this movement. But there is another factor which has been more potent. The manufacturers of automatically operated equipment have, in many cases, been able to design apparatus which operates more quickly, more accurately and more reliably than the human brain. Some of these devices act as feelers which detect, locate, measure, sec-

tionalize and almost anticipate overloads, short-circuits and grounds.

Much of the progress which has been made is also due in a large measure to those mine electrical engineers who have spent time and effort to help the manufacturers perfect their apparatus and properly interpret the requirements of the industry. The history of most successful devices, used in mines, therefore, almost invariably includes a long chapter of co-operative effort between the man who uses the apparatus and the manufacturer. By this direct contact the manufacturer gets to know the adverse conditions of the mines and when he has developed his apparatus he can feel sure it is acceptable to the many engineers of the industry.

The success which the Lehigh Valley Coal Co. has had with automatic circuit-breakers and substations recently led it to install at the Centralia Colliery, Centralia, Pa., a carefully devised system for controlling and protecting the direct-current feeders. At this mine there are three substations for converting alternating current to direct current. Each machine is rated at 200 kw. and supplies 275-volt direct-current energy.

These machines are located on the surface at points about a mile apart. At A in Fig. 1 is an automatic synchronous motor-generator outfit, at B and C manually operated synchronous converters are used. All

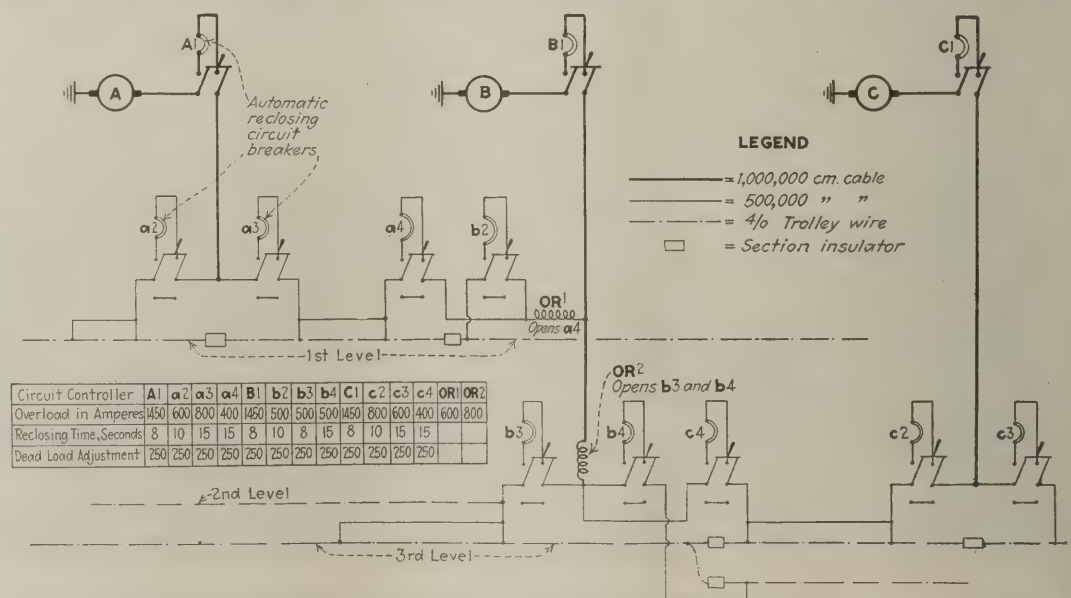


Fig. 1—Complete Underground Power Distributing System Showing How Continuity of Service Is Made Possible by Use of Automatic Circuit-Controlling Devices

Three sources of direct-current supply are tied together by means of station and tie-feeder type circuit breakers. The main generator breakers are tripped open only under unusual conditions. When overloads occur special relays first relieve the generators of the less important loads so that the main circuits and the more essential mining equipment may operate almost continually. Repair and adjustment of the control devices may be made at any time. Bypass double-throw knife switches disconnect the breakers from the lines but maintain service. By the use of only two different type breakers, maintenance costs are greatly reduced and the workmen quickly learn how to make any necessary adjustments and repairs.



machines receive their alternating-current supply from the same transformer substation but through three different distributing lines running from the main transformer bank. The direct-current output of each machine passes through an automatic reclosing circuit breaker shown at  $A_1$ ,  $B_1$  and  $C_1$ . These breakers each have a normal rating of 800 amp. and are known as booster station panels.

Before installing automatic breakers inside the mines the chief problem was to eliminate delays caused by interruption of power on the main feeders running from the various substations. High peak loads, short circuits and grounds were almost continually opening the main breakers in the substations. These delays were also caused by trouble with the wiring of some of the mine equipment, by falls of rock bringing the trolley or feeder into contact with the rails, by steel cars jumping off the track and touching the trolley, by overzealous locomotive operators starting trips of cars too quickly.

As a result of these difficulties the substation equipment was being overloaded almost continuously, throwing the whole generating capacity of the machines off the lines an average of forty times during an eight-hour day. Delays lasted from ten seconds to five or fifteen minutes depending upon the cause. Often the delays were much longer, especially when a short-circuit had to be located by the workmen and sectionalized by hand-operated switches. As automatic reclosing circuit breakers have been installed in the mines, as will be described, the main booster station breakers now open an average of once a day and that is usually only when the converting equipment is shut down for the night.

#### BREAKERS DO NOT TRY TO RECLOSE ON OVERLOAD

These booster station breakers operate as follows:

- (1) Are closed by an electro-magnet, provided the generator voltage is of correct value and other conditions are normal.
- (2) Open automatically in case of overload from any cause, voltage failure or reverse current.
- (3) Remain open a definite time interval, regardless of cause for opening.
- (4) At expiration of this time interval, reclose automatically provided the generator voltage is of correct value, correct polarity, and provided there is no short-circuit or overload condition on the load side.

These breakers make no attempt to reclose while the overload conditions exist, but reclose instantly upon removal of the conditions which cause or would result in overloads. A diagram of these breakers is shown in Fig. 2.

Each breaker is set to open when 1,450 amp. are flowing and reclose in eight seconds, provided the voltage at the center of the bridging resistance is about 250 volts. Depending upon conditions, the breaker can be made to reclose when a slight load remains on the circuit. This is to obviate the necessity for cutting off the dead load of lamp circuits and small motors which ordinarily stay connected to the lines when the breaker opens.

For inspection and repair purposes the breakers may be completely disconnected from the lines by means of a two-pole, single-throw 800-amp. enclosed knife switch mounted directly below on the same pipe-frame support as the breaker. One pole of the switch disconnects the main feeder from the breaker while the other opens

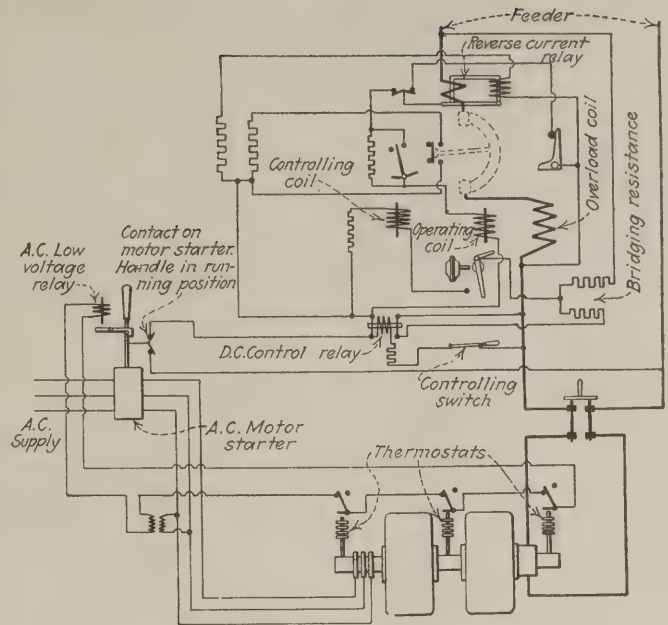


Fig. 2—Control Circuit of Booster-Station Panels

These breakers completely protect the generating machines and main feeders. Auxiliary equipment connected to the breaker makes the operation of the direct-current side of power-converting machines and direct-connected generators automatic.

the circuit from the machine; thus when the switch is opened the device is entirely de-energized.

At points  $a_2$ ,  $a_3$ ,  $a_4$ ,  $b_2$ ,  $b_3$ ,  $b_4$ ,  $c_2$ ,  $c_3$ , and  $c_4$ , in Fig. 1, the current passes through 600-amp., 275-volt, tie-feeder type automatic reclosing circuit breakers, located inside the mines. This type of breaker is generally used in circuits supplied with energy from the different sources. It opens on overload, irrespective of the direction in which the current may be going at the time.

Its operating characteristics are as follows: (1) Breaker is closed by means of an electro-magnet. (2) Opens automatically in case of overload on either side, or voltage failure. (3) Remains open a definite time interval regardless of cause of opening. (4) At the expiration of time interval, if there is a short-circuit or overload on either side of the controller, it makes no attempt to reclose while the overload condition exists, but closes instantly upon removal of short circuit or overload condition. A wiring diagram of this breaker is shown in Fig. 3.

These breakers are disconnected for inspection or repairs by a two-pole 600-amp. double-throw enclosed safety switch. When the switch blades are in the upper position the breaker is in service. When the switch blades are thrown to lower position power is bypassed around the breaker. Inspection or repairs can then be made with perfect safety to those making them while power is still being supplied to the circuit to which the breaker was connected.

The output of machine  $C$  goes through a 1,000,000-c.m. cable down a shaft a distance of 350 ft. where it divides into two section feeders. Breaker  $c_2$  is set to open at 800 amp. and  $c_3$  is set for 600 amp., consequently the total overload settings of these two feeder-circuit controllers equals 1,400 amp. or 50 amp. less than the overload setting of the main breaker at  $c_1$ . It is obvious that the only time the main breaker will open on overload is when there is a current of 1,450 amp. passing through it, which can only be caused by a short-circuit on the main feeder between the machine and breakers  $c_2$  and  $c_3$ , upon failure of one of the



breakers or when either one or both are cut out of service for inspection or repairs as described above.

The advantage of this method of connection readily will be seen, because when the controllers are in service the only section that will be cut off from a supply of power will be the one having the overload or short circuit on it.

The output of machine *A* is limited in exactly the same manner as machine *C*; the output of machine *B* is also limited by similar means with the exception that power from *B* first passes through two 600-amp. instantaneous overload relays, connected as illustrated at *OR*<sub>1</sub> and *OR*<sub>2</sub> in Fig. 1. These relays are set to operate at 600 and 800 amp. respectively.

When the combined load on breakers *a*<sub>1</sub> and *b*<sub>2</sub> becomes excessive relay *OR*<sub>1</sub> opens breaker *a*<sub>1</sub>. This often prevents the main breaker, *B*<sub>1</sub>, from opening and shutting down all the equipment close to it. Similarly relay *OR*<sub>2</sub> first opens breaker *b*<sub>2</sub> to relieve its load and later opens breaker *b*<sub>1</sub> if the overload condition or relay *OR*<sub>2</sub> persists.

#### HAVE LOCATED RELAYS NEAR CONTROLLERS

Each relay is located near the controller or controllers it is desired to disconnect, the controller being disconnected when the relay operates on the overload current for which it is set. Normally closed contacts on the *OR* relays open the control circuit of the tie-feeder breakers.

The use of these relays means a saving of the pur-

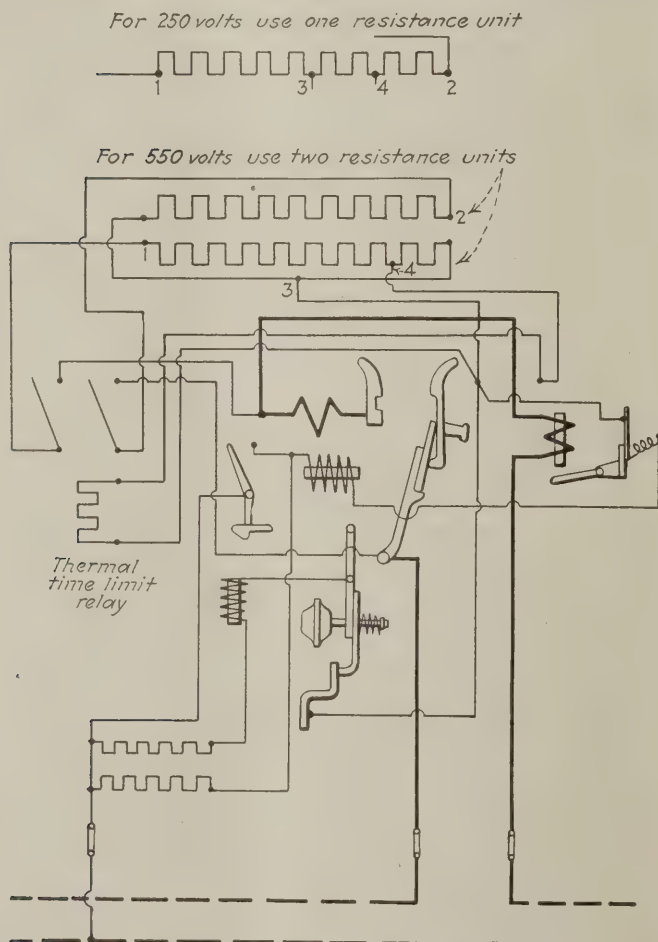


Fig. 3—Tie-Feeder Circuit Controller

Like the booster station breaker this device provides protection much better than that which could be accomplished by manual operation. It opens regardless of the direction of the current through the overload coil. Just as soon as the overload condition is removed it automatically recloses and re-establishes service.

chase and maintenance of two additional automatic breakers and in turn also simplifies the system. This arrangement may appear complicated but it really is not. It provides continuity of service by the use of the minimum number of control units.

Machines *A*, *B* and *C* are tied together by means of a 500,000-c.m. feeder cable which runs along main haulageways inside the mines. Breakers *a*<sub>3</sub>, *a*<sub>4</sub>, *c*<sub>1</sub> and *c*<sub>2</sub> sectionalize any overloads which may occur along this line and any disturbance is localized within its particular section.

#### BREAKERS ARE OF TIE-FEEDER TYPE

Breakers *a*<sub>2</sub>, *b*<sub>2</sub>, *b*<sub>3</sub>, *b*<sub>4</sub> and *c*<sub>3</sub>, although used for independent feeder service, are of the tie-feeder type and therefore are available to replace one of the more important tie-feeder controllers should the occasion arise. By using tie-feeder breakers throughout it is always safe to interconnect different sections should future mining development necessitate changes or an additional substation at the end of one or more of the independent feeder circuits.

With this arrangement there are only two different types of breakers to be familiar with, carry spare parts for and maintain. As the load shifts from one section to another it makes it possible to maintain a fairly balanced feeder system and to obtain the many advantages of power saving, continuity of service, etc. already enumerated.

#### Builds Two-Ton Mine Car in Five Hours

JOSEPH MARTIN, car repairman at Whipple, W. Va., for the New River Co., on June 11 assembled a mine car complete, including greasing, in five hours and eight minutes. And this is just a sample of his everyday work. The car has an average capacity of 3,800 lb. All the boards were sawed by Mr. Martin without assistance with the exception of the timbers used in the bottom. As this could not be done by one man, a blacksmith assisted him in cutting them. To bind the car together Mr. Martin bored 148 holes, inserted bolts and screwed on the necessary nuts making them tight. Mr. Martin has often built a car in the same approximate time. Of course, the irons of the car were shaped and drilled ready for assembling or building of the car, whichever is the more correct term.

#### May Feed Immunized Coal Dust to Hogs

The Department of Agriculture, says *The Explosives Engineer*, declares that a dust mixture of about 60 to 75 per cent limestone and 25 to 40 per cent coal is a good base from which to build a desirable food for swine, so we can feed the immunized floor dust in the mine to the hogs when we wish to replenish it with fresh limestone dust.

Dr. Davis, of the Bureau of Fisheries, welcomes rock dust, believing it will greatly reduce the acidity of mine drainage water and help to prevent the destruction of fish after a mine has been thoroughly and repeatedly dusted for many years. This will reduce the pressure for restrictive legislation. Departing from the authority first above mentioned it may be added that the presence of limestone may reduce pump and pipe corrosion and so may help to justify stone dusting as an economic measure altogether apart from its preventive value with regard to mine explosions.





# News Of the Industry



## World Conference at London Surveys Power Resources

**All Authorities but New Zealanders and Some Canadians Favor Private Ownership—Non-Friable Coke Made by Low-Temperature Process—Hydrogenation Solution of Benzol Problem**

After preparations of more than a year the World's Power Conference met at London, June 30 to July 12, with representatives of some thirty-eight countries present. As O. C. Merrill so well stated at the opening session, "Technology, economics and finance know neither politics nor parties and recognize no boundaries of race, nationality, language or creed." International comity is being established, men of different nationalities are becoming acquainted in the closest manner and the engineer is doing yeoman service in knitting a war-weary world.

The British did not fail to stage the conference well. The Prince of Wales, honorary president of the congress, addressed the opening session, and the Earl of Derby, the president of the conference, conducted the session. Sir Joseph Cook spoke for the British dominions, saying that today the world needs a balancing of accounts rather than a balance of power, which could be attained only by developing power to the fullest extent and by seeking to obtain it from new sources.

M. Guillaume, Director of Mines for France, and Guido Semenza, of Italy, replied for France and the other countries of Europe respectively. Dr. Kamo spoke for Japan and other Asiatic countries. O. C. Merrill, secretary of the Federal Power Commission of the United States, replied for the United States and South American countries, making a speech that was among the best at the conference.

### Papers Cover World's Power

The scientific papers were delivered in the conference halls of the British Empire Exhibition, Wembley, London. In a few sessions the papers were read by title only; at others they were read at some length, hindering discussion. They covered the power resources of the world, the economic-financial, legal and government policies in regard to power, power development, water-progress, steam-power plants and equipment and the preparation of fuels. Fifty-five papers were presented relative to power resources.

J. P. Noonan, president of the organized electrical workers of the United States, representing the American Federation of Labor, stated that labor stands unequivocally ready to

co-operate to the fullest extent in the development of power. The present labor movement, said Mr. Noonan, realizes that labor-saving machinery is really for labor's benefit. He urged a closer contact and a better understanding between labor and employer. Lack of understanding, said he, has caused both sides to be suspicious of each other and has caused labor to spend money and time in an endeavor to defeat

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World power conferences by introducing the developments of one country to the representatives of another will speed up the world's progress. Even the big advances travel but slowly from country to country. The smaller devices and less showy methods lie still longer untransported. Travel has been left largely to the idlers of the world. It is well that today the aggressive engineers are meeting in world congresses, the better guaranteeing that the world hereafter will dwell in peace.

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legislation which when later examined proved to be for the good of labor and not for its detriment.

Government ownership naturally had few adherents. Even in Italy the government has tired of railroad operation and would part with its railroads if it could find anyone who would buy and operate them. The Canadians connected with the hydro-electric power development of course defended government ownership, and the New Zealanders declared that only by such means could power have been distributed to the most distant farmhouse of their country, but they were little disposed to recommend their practice to others.

Dr. Arthur T. Hadley, president emeritus of Yale University, said that experience had shown that an industry not completely developed and standardized—and few, it may be added, are of this character—could not be handled satisfactorily by the govern-

ment. Sir Philip Lloyd Graeme, of Great Britain, declared that the function of the government with regard to power development was to make laws that would attract capital to development, and that at times of stress it may go further and use its credit and even its cash to make possible developments that otherwise would be retarded. Dr. George Otis Smith, director of the U. S. Geological Survey, advocated "public regulation always; government operation never."

### Discusses Steam Power Plants

Two interesting sessions dealt with steam-power plants. Pulverized coal and boiler construction were the leading subjects. One session was devoted to turbines. Four papers were presented on illumination.

Three sessions were devoted to preparation of fuels. Prof. H. E. Armstrong exhibited Coalite manufactured from Kent coal and showed that it was far from friable. He said that it was made from finely powdered coal by carbonization in iron retorts at a temperature of 600 deg. and in about four hours. The yield of coke was about 80 per cent, but the yield of oil was low. Dr. R. Lessing declared that we can hope to convert the whole of the coal substance into liquid only by hydrogenation. He said that we could not expect to get the needed supplies of oils from coal except by some such process and that Dr. Franz Fischer's paper gave only a limited promise of success.

### Sufficient Oil from Coal Unlikely

The presence of oxygenated compounds in coal made it unlikely that we would ever get such large quantities of oil from coal as we desired. The oil described by Dr. Fischer was not made by the Bergius process but synthetically from carbon monoxide and hydrogen by polymerization. Dr. C. H. Lander said that some fifteen or twenty different ways of distilling coal at low temperatures had been tried, some of which the government had financed. Some had resulted in making good coke, good oil and sufficient gas, but the experiments had been unsuccessful because the plants had depreciated so rapidly or because the initial and maintenance costs were so heavy that they could not be a financial success.

Mr. Orrock, United States, said that the gas works could do little in the way of low-temperature carbonization so long as the load factors were only 30 to 35 per cent. The process was advantageous only where the load factors reached 40 to 50 per cent. Higher factors than these were found



nowhere except at a few metallurgical works running 24 hours a day and seven days a week. Byproduct recovery could be applied readily to a power station, but it was extremely expensive and many plants that had been started as byproduct plants ultimately restricted themselves to the making of gas and coke only, as the market for sulphate of ammonia and for tar was altogether too uncertain. The manufacture of oil from coal would not be profitable till the price rose considerably.

B. F. Haanel, of Canada, said that the central Canadians had accustomed themselves to the use of anthracite, and their stoves were adapted for the burning of that fuel. Consequently the Canadian Fuel Board was endeavoring to find a Canadian product that would be a good substitute for United States anthracite. It was making investigations into the possibilities of erecting coke-oven plants at strategic points where the Nova Scotia coals could be coked into a domestic fuel that would substitute for anthracite and produce gas for domestic and industrial purposes.

#### Canada's Problem in Lignites

Hydrogenation of coals seemed to him a far cry, for the natural oils would not be exhausted for years. The problem for Canada was the use of low-grade lignites which were not suitable in the raw state for steam or domestic purposes. Important especially was the question as to what could be done with it for railroad purposes. Though experiments had been proceeding with Saskatchewan and Manitoba lignites for five years no commercial success had been attained. It appeared that the logical way to deal with lignite was to pulverize it. A central heating plant was being installed in Winnipeg at which these lignites would be pulverized and used for the generation of steam.

A. E. Douglass, the Fuller-Lehigh Co., Fullerton, Pa., said that the average cost of pulverizing at twenty-six of the most recent plants in America was 45c. per ton, where 100 tons were used per day. This figure embraced everything except fixed charges. It covered labor, repairs, power and lubrication, cost of cleaning buildings and supervision. Where the consumption was 150 tons a day the cost was 41c. a ton; with a consumption of 200 tons per day the cost fell to 40c.; with 250 tons to 38c.; with 400 tons to 36c.; with 500 tons to 34c., whereas for plants using over 1,000 tons per day the coal could be pulverized for slightly under 32c. per ton. These figures were averaged for anthracite, lignite and bituminous coals. With anthracite the cost was higher than with bituminous, probably owing to cost of repairs and increased power for pulverizing.

Mr. Douglass said that in most cases where proper storage bins had been installed the pulverized coal had given no trouble. The temperature should not exceed 200 deg. F., and the moisture content should not be too high. To show how powdered fuel can be stored, Mr. Douglass instanced a case in Seat-

#### Wheat Crop to Help Coal Business in Southwest

One of the handicaps of the coal business during the past year in the great agricultural belt of the Midwest was the farmer's inability to pay his bills because of low prices for his crops. This year the prospect is brighter, according to a bulletin of the Colorado & New Mexico Coal Operators' Association just issued by its secretary, F. O. Sandstrom, of Denver. Wheat, which sold well under \$1 last year, is now trading in Chicago, Kansas City, St. Louis and Minneapolis at around \$1.30 and the Southwest is about to harvest a bumper crop.

Mr. Sandstrom's figures show that the combined yield of Kansas, Nebraska, Oklahoma, Texas and Colorado was 177,288,000 bushels last year and will be approximately 241,000,000 bushels this year, making a net increase of 63,000,000 bushels, or about 35 per cent. The carriers serving that territory, he finds, are well equipped to move the crop, as indicated by ample supplies of cars in uniformly good condition. "This," writes Mr. Sandstrom, "should naturally be reflected in an increased coal tonnage to this consuming territory."

tle where pulverized coal had been stored for seven months, from the hot season to the fall. He did not advocate the manufacture and use of pulverized coal at small industrial plants where good quality coal was at hand. As a matter of fact he was turning down several hundred inquiries a year from small industrial plants.

Mr. Douglass said that in Australia pulverized fuel is being made from brown lignite having 22 to 28 per cent of moisture. It is used in locomotives.

In western Canada coals having 18 per cent of moisture and 30 per cent of ash were being pulverized for fuel, and he added that where similar coals were being used in sugar-refining plants in British Columbia an efficiency of 83 per cent has been obtained. Similar fuels had been pulverized and were being used for railway purposes in Italy, Holland, Brazil and Manchuria.

#### Powdered Coal Highly Efficient

David Brownlie, discussing the papers on fuel economy, said that with pulverized fuel an efficiency of 90 to 92 per cent, and with mechanical stokers of 88 per cent, could be attained, but the methods of testing were so varied that the recorded efficiency might vary 3 per cent. There were three methods of testing boilers, those of the American Society of Mechanical Engineers, the Continental Code of the German Society of Engineers and the British Code of the Institution of Civil Engineers. This last, Mr. Brownlie declared, was a disgrace to British technicians.

#### Ten Men Die in Second Gas Explosion at Gates Mine

Ten miners were killed on July 25 at 7:30 p.m. by a gas explosion of unknown origin in the Gates shaft mine of the H. C. Frick Coke Co., at Gates, Fayette County, Pa. It is said that 120 men on the night shift were in the mine, but as the explosion was local in nature all but the ten men who were killed reached the outside safely and little property damage resulted. In February of 1922 an explosion ignited by a blown-out shot in this mine killed 25 men.

Whether the explosion originated at the face of an entry or in a room has not been determined definitely, nor is the agent of ignition known. It is not likely that a blown-out shot ignited the gas, as shooting had not yet begun when the explosion took place. In view of the fact that electric cap lamps are worn exclusively by the workers and electric drills were not in use, it is possible that a defective cutting machine was the agent of ignition. The Gates mine has been working every day.

The H. C. Frick Coke Co. is so well equipped and otherwise prepared for mine-rescue work that it did not require the aid of the U. S. Bureau of Mines rescue car and crew located at Pittsburgh. Gas analyses taken soon after the explosion showed that the oxygen content of the air in all parts of the mine was sufficient to support life, for which reason gas masks were worn extensively by the rescue crews. All the bodies of the victims were recovered soon after the explosion.

The explosion, according to Coroner Baltz, was discovered in a most unusual manner. John Kelly, a Gates miner, was returning to Gates from Palmer, three miles away, when he noticed a peculiar settlement of dust on his shirt. Kelly stopped to investigate and found that it was coal dust.

Knowing that the dust from a mine very rarely reaches the surface, he glanced toward the mouth of the Palmer mine and saw a cloud of smoke and dust floating from the shaft mouth.

Kelly ran to the Palmer foreman's office and sounded the alarm. Ten rescue crews donned helmets and, believing that the Palmer workings were on fire, they went into that mine.

Their search was fruitless. Kelly recalled that an old tunnel connected the Palmer and Gates mines and he suggested that the trouble was in the latter working. Within a few minutes the rescuers were on their way to the Gates pit. As they reached the shaft they met a crew of miners coming out.

These miners, at work two miles from the scene of the explosion, knew nothing of the blast. But the rescuers went down and soon found the cave-in, behind which ten bodies were located.

S. Pemberton Hutchinson, president of the National Coal Association, will return from his European trip Aug. 15. While in Europe Mr. Hutchinson has been making some general observations as to the possibilities of increasing the exports of American coal.



## Stocks Nearly Worked Off, Better Demand and More Work Soon, Says Brophy

Altoona, Pa., July 30.—“Much of the surplus stock of coal has been worked off, and we have every reason to believe that within the next few weeks there will be some improvement in demand and more work at the mines,” said John Brophy, president of District No. 2, United Mine Workers, at union headquarters in Clearfield, when asked by *Coal Age* to make a statement regarding the immediate outlook for the coal industry in his district.

Many of the operators in the district are non-committal as to possible developments in the early autumn while several agree with President Brophy and have not hesitated to predict at least a partial resumption of mining following a long period of inactivity.

It was pointed out that some of the collieries are now making preparations which would indicate that they expect to operate on a more extensive scale at an early date. It also was ascertained that some of the leading operators are anything but hopeful.

The spring and summer of 1924 have been the dulllest in the history of the district, and not only have the miners and their families felt the depression but every industry directly or indirectly affected has suffered. Merchants report heavily decreased sales and hundreds of young miners have departed from the mining centers and found employment in other lines of industry, thus lessening the purchasing forces of the coal communities.

Extreme pessimism has prevailed, especially in those communities which depend wholly or largely on the coal trade.

### Many Mines Closed Down

From operator sources regarded as authoritative it was ascertained that of the 191 mines on the Tyrone and Clearfield branch of the Pennsylvania R.R. and its feeders, 141 mines are now closed down entirely. Thirty-five of the remaining 50 are operating on an average of five days a week and 15 only two days a week.

At Morrisdale, normally a good coal town, there was mine work one day during the week ended July 19. No. 1 shaft and No. 2 shaft of the Morrisdale Coal Co. are closed down entirely and there is little or nothing doing at the Cunard Coal Co.'s slope.

Operators are quite generally of the opinion that a lower wage scale, which would enable them to produce at a lower cost, would partly solve the problem, a contention that is not admitted by President Brophy, nor is it admitted by many well-informed miners of the district. But the operators' view is fairly well expressed in the answer given by one of the leading producers in the Philipsburg region when asked to diagnose the situation.

“There is nothing the matter with the coal business,” said he, “except that there isn't any and no prospects of getting any. There can be no coal business to amount to anything in the Clearfield region as long as the costs of production are in excess of those in competitive regions. The union wage



James L. Cooney

Recently chosen president of the Scranton Coal Co. in succession to the late Frank E. Platt. He was general manager just previous to his accession to the presidency.

scale does not permit the operator to dispose of the product of his mine at prices which the operators in the non-union fields quote. The buyers of fuel purchase at the lowest quoted prices, other things being equal.”

The manager of one of the leading coal corporations operating in the central Pennsylvania field, speaking of conditions and prospects, said:

“Operators of long experience know that April generally is the low production month of the year. Operators were, therefore, of the opinion that the low output last April was characteristic of past performance, and they expected that business would improve during each succeeding summer month. This hope was badly shattered when the month of May showed no improvement over April and when June production was lower than May. The indications are that July will be worse than either, both as to price and production.”

Of the operators disposed to take a more cheerful view of the near future in mining is James Wilson, brother of William B. Wilson, Secretary of Labor in the late President Wilson's Cabinet. He is associated with the Conestoga Coal Co., in Irvona, and the Acme Coal Co., of Philipsburg, two organizations that might quite properly be classed among the big body of smaller operations whose combined output shows up large in production totals. Mr. Wilson takes the stand that the extreme dullness in the coal trade is nearly certain to be followed by a movement in the opposite direction. The cooler weather, he states, will bring a demand for coal.

One of the disquieting developments of the situation is the growing impression that the operators are engaged in a freeze-out game. One hears of it frequently in conversing with miners. Like views have been expressed by persons not engaged in the mining industry in any capacity. It is charged that the operators after entering into an agreement with the union miners have apparently made no effort to obtain orders or run the mines, but are themselves quietly but none the less effec-

tively on strike. Such a view, however, is not held by Mr. Brophy, who maintains overdevelopment is the chief reason for the depression. His statement, in full, follows:

“The coal trade is unusually dull in this district. That is admitted. But we do not agree to the claim of many of the operators that this district alone is affected by slack work. All bituminous districts, union and non-union, are alike affected, as shown by the report of the Geological Survey for the week ending June 28, which gives the percentage of full time output for central Pennsylvania at 41.1; Maryland, which is operated non-union, 39.1 per cent, while the New River field of West Virginia, also non-union, which is so often referred to by the operators of this district as an active competitor, 48.5 per cent.

“Overdevelopment is the reason for bituminous coal being a part-time industry. With double the mine development necessary to take care of the market needs of the country, slack work is chronic. This condition has been intensified by some slowing down in business during the last twelve months, and the further fact that large surplus stocks of coal were accumulated during last winter and the three first months of this year in anticipation of a possible strike.

### Much of Surplus Worked Off

“When the strike did not materialize, the stocks of coal had to be worked off before the users would buy, even in quantities equal to current consumption. Much of the surplus stock has been worked off by this time, and we have every reason to believe that within the next few weeks there will be some improvement in demand and more work at the mines.

“Lowering the union scale would not benefit the coal trade any, because the non-union operators could and would promptly reduce wages so as to maintain a lower rate than the union rate. Each union reduction would be followed by a non-union reduction. The demand for coal would be unchanged and the miners would have no more work and would be reduced to abject poverty.

“The mine worker is entitled to a decent livelihood. The consumers are entitled to ample fuel at reasonable prices. If the present managers, the operators, cannot bring the industry to a basis of efficiency that will assure these two things, the operators must expect the people ultimately to demand legislation that will regulate the coal industry.”

Northern Cambria County is in practically the same straits as the Clearfield and Philipsburg region. The Pennsylvania R.R. has discontinued hauling coal over the Bellwood division and all coal must get to the main line by way of Cresson. In the Johnstown district there is a little more activity due to the Bethlehem Steel operations and railroad contracts at South Fork and other points along the main line.

Somerset County is shipping most of the coal from the district by reason of a lower or non-union scale. Business in Indiana and other counties in the district continues in the dull class.





C. W. Bryan's Municipal Coal Yard

As Mayor of Lincoln, Neb., Charles W. Bryan, now Governor of Nebraska and nominee for Vice-President on the Democratic ticket, established a municipal coal yard to protect the public against "coal barons." The gentleman in the foreground is E. H. Shroder, a real estate operator and friend of Mr. Bryan, who lent his co-operation to make the plant possible.

### Consumer Can Remedy Coal Troubles by Initiative in Storage, Says Hammond

In heavier storage lies largely the solution of the difficulties of the coal industry, according to the foreword which John Hays Hammond prepared for the report of the Coal Storage Committee of the American Engineering Council. The consumer, Mr. Hammond thinks, should take the initiative in bringing about a remedy.

"This report on an engineering survey of the possibilities of improving the method of procuring and storing coal should appeal to producers, carriers and consumers as the key to the solution of many of their troubles," says Mr. Hammond, who was chairman of the U. S. Coal Commission.

"The President's Coal Commission, learning of the purpose of the American Engineering Council to make such a study, assigned to it the task of conducting an extended engineering survey of the storage of coal. The commission and other government departments have collaborated with the American Engineering Council extensively, the survey has been conducted by over 400 engineers in leading industrial centers, and the report has been formulated by a committee of prominent engineers recognized authorities in each branch of the subject covered.

"The operation of the coal industry probably is beset with more difficulty than any other of the great American industries, due to prevailing intermittence of operation. If this evil could be removed it is plainly evident that a tremendous step would be taken in regularizing the coal industry and in helping other industries which are partially or wholly dependent on coal.

"The solution undoubtedly lies in greater storage. A reasonable accumu-

lation in storage will permit of more even production throughout the year, deflation of the coal industry, continuous employment of labor, relief of congestion on railroads during their maximum demand season, removal of the coal 'feast or famine' conditions among consumers and many other allied troubles that are now felt as coal takes its course from mine to point of combustion.

"The fears of loss by the consumer have been studied by the committee and largely dispelled.

"In the past the operators have said that storage is the duty of the railroads, whereas the carriers have contended that it is the duty of the consumer, and as a result storing has been neglected. This cycle must be broken, and a unified, economically sound practice established. The report wisely recommends and urges that the consumer, potentially the largest benefactor, should apply the needed balance wheel through himself initiating storage."

### Strike at Loader Mine In Illinois Continues

The strike of cutting-machine runners in Orient No. 2 mine of the Chicago, Wilmington & Franklin Coal Co. runs its steady course without a sign of break. This is the mine in which the first Illinois machine loader scale of \$10.07 a day was agreed to by men and company and which took effect July 16. The mining-machine men struck on that day, asking 14.6c. a ton instead of the 13c. agreed to in the new contract, and objected to the system of territory assignments besides registering other kicks at the new order of things in the mine. The men who operate mechanical loaders were ready to work under the contract but the cutting-machine operators have tied up the property.

### Wages of Hard-Coal Miners Rise Faster Than Those of Any Other Basic Industry

The average hourly earnings of all groups of wage earners in anthracite mining are now at the highest point since June, 1914, according to an investigation made by the National Industrial Conference Board, New York City. The renewal of the two-year agreement between the miners and the operators, providing for a 10 per cent wage increase, the board states, shows that the increase in average hourly earnings is 190 per cent above the rate of June, 1914. The composite figure of average hourly earnings in the industry covering all groups of wage earners, that is, common, semi-skilled and skilled labor, both inside and out, as well as contract miners, increased from 27.8c. in June, 1914, to 80.7c. in December, 1923. That the wage contract is closely adhered to by the various operators is shown by the fact that since December, 1923, further figures denote practically no change in the average earnings up to May, 1924, the general trend remaining at as steady a level as it did under the old contract.

The highest percentage of increase took place in the case of common outside labor, 218 per cent. The next highest recorded was for semi-skilled inside labor, 207 per cent, closely followed by common inside labor, 205 per cent. Semi-skilled outside labor increased 188 per cent. The lowest per cent of increase for both inside and outside labor was noted for skilled work, being 181 and 170 respectively. The percentage of increase of contract miners was 188.

At the present time the board's index figures reveal that anthracite mining wages have risen to a higher peak since 1914 than those of any other basic industry.

### Drum Deposed as President Of District No. 16

F. J. Drum, president of district 16, United Mine Workers, whose office is at Cumberland, Md., has been requested to resign his office effective July 25, according to James E. Jones, national union organizer, who is temporarily in charge of the district's affairs. No official reason for Drum's dismissal was given.

Drum, who has been president of the district more than ten years, led a mine strike which lasted over twenty months, and finally was given up by the national organization on Nov. 22, 1923. This strike was said to have cost the United Mine Workers over \$750,000 and to have caused the disruption of the union in the George's Creek and upper Potomac fields.

Jones will be assisted in the administration of the district's affairs by William P. Murray, of Pittsburgh, brother of Phil Murray, vice-president of the United Mine Workers' national organization.

District 16 embraces mining regions in Maryland, Pennsylvania and West Virginia.



## Adoption of Illinois Loader Scale Hailed In Washington as Progressive Step

Government Officials Foresee Spread of Machine Mining with Marked Cut in Production Costs—Far-Reaching Effects on Market Expected—Pickup in Union Fields Likely

BY PAUL WOOTON  
Washington Correspondent of *Coal Age*

Illinois' loader scale came as an unexpected but highly gratifying surprise to official Washington. It is regarded as a progressive step of outstanding importance. Opposition to the employment of machinery in coal mines long has been regarded as one of the sinister things which could be laid at the door of the union. The Illinois membership of the United Mine Workers has been regarded as the most reactionary element in that organization. That it should be willing to take this progressive step is regarded as making certain the universal application of this policy.

On the assumption that this agreement soon will apply to the entire Illinois field, it is predicted that there will be an appreciable lengthening of the radius which marks the limit of the territory in which Illinois coals can compete. This step toward lowering production costs in Illinois did not come too soon, as the mines in that state have been operating at 25 per cent of capacity for four months.

### Markets May Be Affected

It is recognized that this action in Illinois, in conjunction with the acceptance of what is practically equivalent to a reduction in the deadwork scale by the miners in southern Ohio and with the informal understandings at individual mines, will have far-reaching effects on the market situation. The fact that the union fields suddenly find themselves in a position to reduce production costs just at the time when everybody believes the market is turning definitely upward, means that the union fields are going to supply more of the country's requirements for the coming winter than anyone had anticipated.

The southern Ohio agreement is of particular significance to the coal mines of that region, since production for five months has not exceeded 10 per cent of capacity.

### Union Reverses Position

One of the most notorious ways in which labor influence was used to limit output was in the Illinois agreement, where a special clause provided that only fourteen loaders could follow a cutting machine. The fact that the union apparently has reversed its position with regard to machines is expected to increase the amount of machine-mined coal in Indiana and Illinois, particularly, to the point where those states will have as large a percentage of machine-mined coal as West Virginia and Kentucky. No figures for machine-mined coal later than those for 1922 are available, but in that year 67 per cent of the Illinois output was machine-mined as compared with 79 per cent in Kentucky. In 1922, 50 per cent of the Indiana production was machine-mined, whereas 77 per cent of the West Vir-

ginia output was produced in that manner. It is known that the West Virginia and Kentucky output of coal mined by machine is now somewhat higher, but a rapid narrowing of the difference is expected under the new conditions.

### Battle Grows Hotter Against Northwest Rate Boost

The battle to prevent the rate increase Sept. 10 on Illinois and Indiana coal going into the Northwest grows hotter daily. All sorts of petitions to the Interstate Commerce Commission to reopen the lake-dock case have been filed. And now comes the Illinois Commerce Commission with a resolution July 24 asking the state Attorney General to take such action, "by injunction or otherwise," as he may think necessary. The state commission takes an interest because it believes the 28c. increase on Illinois coal into the Twin Cities will cut seriously into Illinois business, thus directly affecting the prosperity of the state's mining industry and the people in it. The depression in Illinois is keen enough already.

The whole course of the adjustment of rates to the Northwest has been tempestuous. The case was bitterly contested in long hearings before the Interstate Commerce Commission more than a year ago. When the decision was finally made in June, leaving rates from the Lake Superior docks to the Twin Cities unchanged and increasing the rail rates from the southward, practically everybody was displeased, even the Northwest dock operators, who had hoped for a reduction in their own haul as well as a larger increase in the Illinois, Indiana and Kentucky haul.

The effective date originally was set for Aug. 21. The carriers protested that there was not time to rearrange and publish the new tariffs within the time limit, which ended July 21, the customary 30 days before the effective date. So they asked for an extension of 30 days. This was refused. Then they asked that the date of publication be set only 10 days before Aug. 21.

Before any decision was made on this a new complication set in. Some of the originating lines, notably the Chicago & Eastern Illinois, which is mainly dependent on coal for its revenue and therefore foresaw a great decrease in business when the coal traffic to the Northwest was reduced, found a loophole. It pointed out that the commission in the decision had directed only the specific respondent lines in the case to increase rates. Since the C. & E. I. was not one of those lines, it announced that it would not increase rates on Northwest coal which it originated.

This caused great confusion among

### Bacon and Beans!

The United Mine Workers' attempt to stem the tide now flowing toward non-unionism in western Kentucky included a recent tour of the field by President John L. Lewis. He addressed some hungry crowds down there, for there has been no work in union mines in that territory for months and there is little prospect of any. However, Mr. Lewis tried to instill courage into the wavering ranks by offering them the stone of prospective victory when they really want bread. Said he at Central City on July 18: "I wish I was as sure of going to heaven as I am of winning this strike." An old woman piped up: "Well, if you-all got any hopes of gittin' into heaven yo' bettah supply mo' bacon 'n' beans."

the other roads until the commission sent that line a telegram couched in pregnant phrases, reminding it that even though it was not specifically mentioned, it was making a bed of thorns for itself if it did not publish rates identical with the other roads. The C. & E. I. gave up.

Then came the commission's order deferring the effective date of the new rates from Aug. 21 to Sept. 10. This helped the railroads some in the matter of time for publishing.

But all this time various protests against the new rates and petitions for a reopening of the whole case were filed by various traffic and shippers' associations throughout the Northwest. The Illinois coal operators filed a long one shooting the commission's order as full of technical holes as possible and suggesting new evidence that of itself would justify a rehearing. The pressure brought upon the commission from all these sources was heavy before the Illinois Commerce Commission adopted its resolution July 24. The state commission enters the case probably with more weight than that exerted by all of the petitioners, because they are directly prejudiced, while it is speaking officially for the whole people of the state.

It is not freely predicted in Illinois what action, if any, may be expected from the Interstate Commerce Commission as a result of all of this, but there is definite hope among coal producers that the commission will not make it necessary for the rates to be dragged into court for a decision. That course, however, might be preceded by an injunction which would maintain the present fabric of tariffs for the whole length of a battle through the courts.

Of course there is no assurance that the Illinois Attorney General will ask an injunction or do anything else. Edward J. Brundage, who holds that office, was operated on for appendicitis last week and probably will take no part in this or any other official action for a few weeks. What his assistants may do is entirely problematical. But the state Commerce Commission has shot its bolt with the adoption of its resolution, and there the matter rests.



## Lewis Probe Averts General Strike at Glen Alden Mines

The recent investigation of numerous strikes among local unions in the anthracite region made by the special committee commissioned by John L. Lewis, International president of the United Mine Workers, is credited with preventing a general strike of the 22,000 employees of the Glen Alden Coal Co., which was called off by general consent July 19 after a meeting of the general grievance committee.

As a result of the meeting all of the Glen Alden workers, including 1,800 employed at the Woodward colliery, who had been on strike for a week, were back at work on July 22. The threat of a general strike came about because of the action of the district officials in revoking the charter of the Woodward local for violation of both the district and international constitutions of the miners' union in calling a strike without the authorization of the district officials.

## Restrains Companies in Use Of Term "Mount Olive"

The Interstate Fuel Co. and the White Ash Coal Co., both of St. Louis, Mo., are ordered by the Federal Trade Commission to cease and desist from making use, by advertisements or otherwise, of the words "Mount Olive" alone or in combination with other words in connection with the sale or offering for sale of coal in commerce, unless the coal so designated is produced at mines located at Mount Olive, Ill., or within a small district contiguous thereto, including Staunton, Ill.

In its investigation of the case the commission found that the respondent companies marketed coal mined in districts other than what is known to the coal trade and to others as the Mount Olive district. Such coal was termed by the respondents as "Guaranteed Mount Olive Coal" and "Coal, Mount Olive Grade."

The findings state that for more than forty years the Mount Olive coal district has produced a coal which has become known to the trade and a substantial part of the consuming public as "Mount Olive Coal." This coal has been extensively advertised under the title "Mount Olive Coal," and has become favorably known because of its high quality and has a higher market value than the coal sold by the respondent companies.

## Southern Ry. to Build Cut-Off

The Interstate Commerce Commission July 17 issued a supplemental order authorizing the Southern Ry. to construct a cut-off outside the city limits of Knoxville, Tenn., about four miles northeast of the location originally planned. This line, as now proposed, will extend from a junction with the Southern's Bristol-Chattanooga line at Caswell to Beverly. About four miles from the latter point connection will be made with the Southern's line extending from Coster yard to Middlesboro, Ky. The new extension will be completed within a year.

## Illinois Town to Hold Mass Meeting Over Coal

Just exactly how black is the future for Illinois coal? The town of Herrin and the county of Williamson, Illinois, want to know. The whole community, in the southern Illinois coal field, is so worked up over the matter that it is to hold a public mass meeting Aug. 20. It has invited the coal operators of the state and the state officials of the United Mine Workers to be present prepared to set forth the case from all angles. The whole southern Illinois region is suffering from all the economic ills which general shutdown and unemployment in its main industry naturally would bring upon it. Although the movement is engineered by the Lions Club of Herrin, it is expected that a great turn-out of miners will be present and everybody is going to have a chance to say his say. This is the first mass meeting of its kind in Illinois.

## N.C.A. Committee to Reduce Waste in Use of Soft Coal

With the idea of developing means and methods which will eliminate waste in the burning of bituminous coal, reducing the smoke nuisance and making bituminous coal a more desirable domestic fuel, the National Coal Association has appointed a research committee to go into those problems. The members of the committee have pledged themselves to attack these problems vigorously. They hope to induce builders to pay as much attention to the heating equipment in a home as they do to the plumbing. Even in large buildings, it is known that too little attention frequently is given the problem of heating them most effectively at the lowest cost.

This action of the National Coal Association follows a recommendation emphasized by Harry L. Gandy in his annual report submitted to the Cincinnati convention. He believes the coal operators will be more than repaid by interesting themselves in consumers' problems. In connection with the work the committee will do, the National Coal Association, will issue a printed booklet dealing with the problems of combustion. The research committee is composed of the following members of the association:

J. C. Brydon, (chairman), president, Quemahoning Creek Coal Co., Baltimore, Md.; L. G. Ball, president Dawson Coal Co., Philadelphia, Pa.; Geo. R. Harrington, president, Chicago, Wilmington & Franklin Coal Co., Chicago, Ill.; J. C. Layne, Jr., vice-president, Marrowbone Mining Co., Cincinnati, Ohio; Louis C. Madeira, 3d, assistant to the president, Madeira, Hill & Co., Philadelphia, Pa.; W. A. Marshall, president, W. A. Marshall & Co., New York City.

## Main Island Creek Co. in Big West Virginia Merger

The West Virginia Coal & Coke Co., of Elkins, W. Va., and affiliated companies in Logan County have acquired the holdings of the Main Island Creek Coal Co., one of the largest producers in the southern part of the state. The amalgamation gives the new concern 58 mines, 225,000 acres of land and between 5,000,000 and 6,000,000 tons of coal as an annual output, making the company the largest in West Virginia. About \$25,000,000 is understood to be involved.

The Main Island Creek company was controlled by the Dalton-Kelly interests of Huntington, with 21 mines in Logan County, and the West Virginia Coal & Coke is affiliated with the Hutchinson Coal Co. of Fairmont. C. N. Hutchinson, of Fairmont, president of the latter company, it is understood, will head the new concern.

## Castlegate Mine Opens Safely

Castlegate mine No. 2, owned by the Utah Fuel Co., of Salt Lake City, Utah, and inactive since early last March as the result of an explosion which cost the lives of 171 men, was reopened on July 21. The mine, it is asserted, has been brought to a high standard of safety. It has been completely equipped with electric lights and rock-dusting and electrical shot-firing devices, as required in the recent amendments to the safety code of the State Industrial Commission.

It is stated that no accumulations of gas were found and but a few indications noted. Analysis of air return showed but 0.12 per cent of methane with a volume of 175,000 cu.ft. of methane in 24 hours. Perforated sprays arranged in circular form have been installed at all partings for sprinkling loaded trips. Other provision has been made for sprinkling cars and loading operations are to be thoroughly wet down.


Pending decision as to the type of rock dust to be used, Chief Inspector of Mines B. W. Dyer recommended the use of gypsum. The shooting system is complete and the company will take away all shooting operations from the miners, drilling and firing by company men when all miners are out of the workings. Certain recommendations are made for further steps in the interest of safety, but in practically every case they are of a character that will permit the mine to continue operation while they are being acted upon.

## Strike Cuts Ruhr May Output


Coal production in the Ruhr during May, according to the *Frankfurter Zeitung*, amounted to 1,310,000 tons, as compared with 7,780,000 tons in May, 1923, and 8,970,000 tons in May, 1913.

Production of coke was 570,000 tons as compared with 1,890,000 in May of last year and 1,920,000 tons in May, 1913. The decline in last May's output was due to the strike.





## Problems In Underground Management



### Few Superintendents Know What Risks Are Run with Explosives

If They Did They Would Increase Supervision, Thus Preventing  
Accidents and Getting a Higher Percentage  
of Lump Coal

"PERMISSIBLE explosives and dynamite deteriorate with time. They are perishable products. Do you keep them fresh by using the old stock first or do you pile the new explosives on the old and use the new stocks first?" said W. J. German, technical representative, E. I. Dupont de Nemours & Co., at the West Virginia Coal Mining Institute. The Consolidation Coal Co. uses its explosives in the order in which they are received. The old stocks are moved first.

Mr. German said that in his travels he had found a dozen or more fuses as short as 6 to 7 in. long already furnished with caps ready for use. The practice of using such short fuses is not only extremely dangerous, it is wasteful of explosives, it produces an excess of fine coal, but still it goes on. The only sure way to eliminate the dangers of the short fuse is by introducing electric blasting.

As for crimping caps on fuse with knives, files, nails or teeth instead of a crimper, Mr. German said that in so doing the user is taking risks such as the men who manufacture the detonators never take. The men who handle explosives should be as careful as those who make them.

#### INSERT DETONATOR AT END

Miners often make a primer in such a way that the detonator, or cap, extends through the side of the cartridge. When thus arranged the dangerous end of the cap protrudes so that when the latter is pushed back into the hole, the loaded end of the cap bumps and rubs against the side of the hole and it may thus be caused to explode. The safe way is to place the detonator in the center of the cartridge parallel to its length and pointing toward the bulk of the explosive.

If the wires of electric detonators are allowed to drag over the tracks a premature explosion may occur, for a locomotive or a cutting machine may be grounded in a nearby place causing stray currents to pass through the tracks. To tamp a hole and prepare a shot when electric drills and cutting machines are running in the same place is most unwise. This practice is common where the shooting is done at night.

Mr. German graphically described a

trip made into a mine in a car with six miners. The roof was low and cleared the tops of the cars by about 4 in. The miners each had three sticks of explosive in each back pocket and electric detonators in their front pockets with the wires projecting. The rails were poorly bonded. Sparks were flying from the couplings and from some of the bolts in the bottom of the car. The miners were turning and twisting in their uncertain seats causing the ends of the wires to touch the iron work on the car bottom. What would have happened had a stray current passed through the detonator wires? In some of our "well-managed" mines such carelessness is common, and mine superintendents should travel the man trip and note these facts.

#### STORE PERMISSIBLES SEPARATELY

The storing of explosives and detonators in a mine by miners is a source of great danger. Often when the men are cleaning up preparatory to starting pillar work they come across explosives and detonators hidden in the gob by miners who have left and failed to remove them from their hiding places. It is hazardous to store explosives and detonators together. A fall of rock, a lighted match or a spark may set off the detonator and detonate the explosives. Permissible powder stored by itself is not dangerous. Mr. German said he could not imagine any way in which permissibles could be exploded without detonators.

Many a shotfirer with pipe in mouth will open a box of caps, regardless of the danger of exploding the whole box should some of the burning tobacco fall into it. Should he bump his head he may well precipitate pipe and contents into the box. Even a spark from a pipe may fire detonators.

Mr. German closed by calling attention to the unsafe and inefficient tamping of shots due to the failure of the company to provide clay, to the miners' unwillingness to make paper cartridges for the clay, and to the desire to use short fuse. When a man is going to use a skin'emback he usually is wise enough not to stay so long that it will go off before he has had time to get back a sufficient distance, but in his haste the proper tamping of the shot is overlooked.

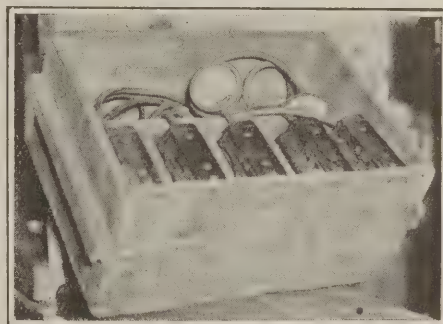
When holes are bored with electric drills the holes are apt to be drilled deeper than the undercut. This is more common in mines where the coal is shot and drilled by crews at night. In one mine the shooting crews had drilled, tamped and charged as many as fifty holes before the places had been completely cut. Under such conditions the depth of the hole and the quantity of explosives used was a matter of guesswork. This slapdash way of shooting is often the cause of the small percentage of lump coal obtained. The company tries to remedy the matter by changing the powder, but the trouble usually is not in the explosive but in the way in which it is handled.

### Kinloch Miners Never Work With Defective Lamps

By R. C. HITESHUE

Master Mechanic, Valley Camp Coal Co.,  
Parnassus, Pa.

The Valley Camp Coal Co., at the Kinloch slope, Parnassus, Pa., finds it advisable always to send into the mine about thirty extra electric cap lamps to replace any of eight hundred in use that develop imperfections during the working shift. The extra lamps, in numbers from two to five, are carried in a box built expressly for the purpose, as the accompanying illustration shows. These

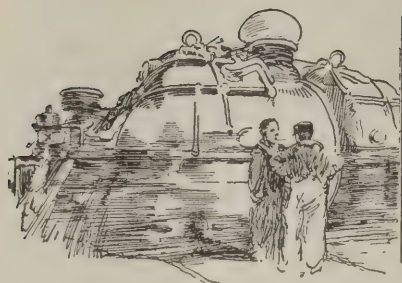


Nest for Five Electric Lamps

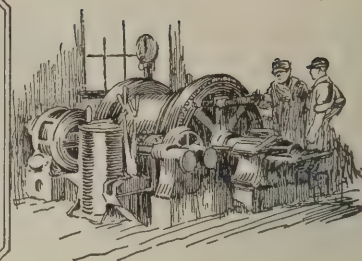
Every motorman is supposed to replace any defective lamps in his district and for this purpose carries a supply on his locomotive.

boxes are loaded onto a supply car and lowered down the slope; then they are distributed, one to each locomotive. When gathering locomotives visit the working place of a miner who has a defective lamp, he exchanges it for one in good condition taken from the lamp box on the locomotive. Several additional boxes are kept at the slope bottom to make sure that a sufficient number of good lamps are available at all times to exchange for those that are defective.





## Practical Pointers For Electrical And Mechanical Men



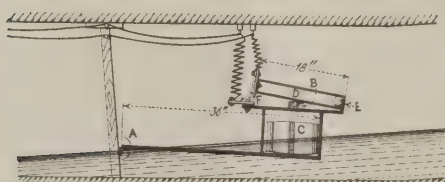
### Will Set Pump in Operation or Stop It Automatically as Need Requires

Rise of Water Causes Ball to Roll from End to  
End of Runway and Establish or Break the  
Current, thus Starting or Stopping the Pump

At many mines water collects either in sumps prepared for its reception, or in dips, swags or swales in either old or active workings, but from which it must be pumped out periodically. The capacity of the pump or pumps serving such places is greater than the average influx of water, so that these machines are not kept running continuously. The usual practice in some cases at many mines is for the pumpman to make periodic inspections of the various sumps and start and stop the pumps serving them by hand. This is never satisfactory, and the sump is liable to overflow or the pump to run dry if the pumpman doesn't happen to be on hand at exactly the proper time.

In order to overcome this difficulty, the automatic device shown in the accompanying illustration has been devised and has given good results. This device consists of a float *C* hinged to a post at *A*, and so arranged that it may rise or fall through a considerable arc. On top of this float a closed runway containing a steel ball *E* is hinged at *B*. On the forward end of this tilting runway is placed the contact of a switch *F*.

As shown in the illustration, this switch is open and the pump, of course, shut down. Suppose now that the water in the sump, which in this case is a portion of an old roadway, rises 17 in. This will tilt the whole float and the runway upon it to such an angle that the steel ball *E* will roll to the opposite end of the runway. This completes the circuit, starting the pump which will continue to operate until the level of the water has fallen to such a point that the runway *D* is inclined to such an angle that the ball will roll to the end at which it is shown in the il-



Regulates Pump Operation

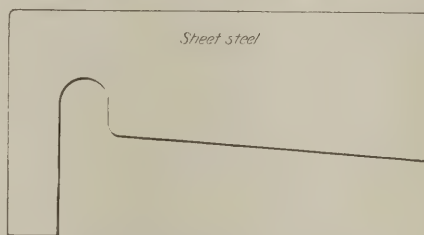
The rise of the water tilts a runway *D* resting on the float *C* causing the ball *E* to roll to the opposite end of the guide. In its new position it completes the circuit by which the pump is operated.

lustration. This will break the circuit and stop the pump.

A contrivance of this kind can be built by anyone fitted to take care of pumps in the mine. The materials employed in its construction are largely odds and ends that may be picked up about any mining plant, and when properly constructed this device will govern the pump perfectly and without any attention whatever on the part of the attendant. Furthermore, the use of a device of this kind removes the human element from the operation of the pump, holds the water in the sump definitely between predetermined levels and saves much power in pump operation.

### Shape Gage to Be Used on Locomotive Wheels

One of the chief causes for locomotive derailments is defective track. Often the tracks are in bad condition,



Gage for Wheel Tread

Every mine machine shop should be equipped with a gage to be used when old wheels are turned down. Unless the tread is properly shaped, accidents and derailments will occur frequently.

because locomotive wheels are allowed to operate with high false flanges. Almost every time mining men meet and discuss their difficulties, locomotive derailments prove to be the most interesting topic. At a recent meeting one mining man said that some of his derailments were due to the fact that newly turned-down wheels are not always properly shaped. He added that his company is now using a steel gage patterned from the shape of a new factory wheel. In turning down old wheels this gage is used as a templet, and in this way the company is sure that all wheels are properly shaped. This gage is shown in the illustration. It will, no doubt, aid in reducing acci-

dents and delays in other mines when generally adopted.

Another interesting feature in connection with this subject, is the necessity of having all wheel treads alike so that the brake shoes and brake rigging will operate satisfactorily. A turned-down wheel improperly shaped does not afford a brake shoe of standard shape a proper grip. This is no doubt another cause for derailments.

### Bell Sounds When Fan Stops

BY ED GUNIA

Master Mechanic,  
Monarch Fuel Co., Rural Ridge, Pa.

Simultaneously with a power failure or a short in the wiring or control equipment in the fanhouse, a warning should be sounded to notify the electrician or some other plant attendant of this condition. Immediate steps can be taken then either to remedy the existing electrical condition or else switch over to an auxiliary drive unit for operating the fan. In our fanhouse at the Rural Ridge mine of the Monarch Fuel Co., near Pittsburgh, Pa., I rigged up a simple door-bell circuit, with a warning bell in the hoist house, to accomplish this purpose.



Watch the Fan

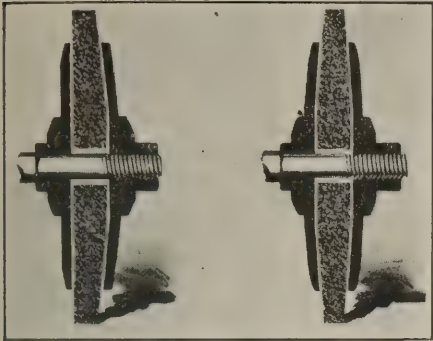
Some years ago a fan stopped running. Fifteen minutes later the mine blew up and killed everyone in it. This illustration shows how the starter box is made to give warning.

Details of the arrangement are shown in the accompanying illustration. To the operating lever of the starter box I attached a copper contact leaf, and another to the box, these forming two terminals of the circuit. When the lever is in running position, the circuit is open; but when the lever jumps back into neutral, following a power failure or a short, the contact leaves are brought together and the circuit is closed and an alarm is sounded.

### Safe Practice When Using Grinding Wheels

Much has been written about the causes of grinding-wheel accidents. Mishaps do happen occasionally and it is, therefore, the best practice never to operate grinding wheels without the wheel being properly enclosed in a





Protection Flanges

To safeguard the workman every wheel used on the stand should be adequately protected. The operator should also be required to use goggles.

hood. Protection flanges for safeguarding grinding wheels are shown in the figure. A pair of goggles to protect the eyes should also be used. The mine-repair shop operator should take advantage of the safety regulations followed in commercial machine shops. To use the right wheel at the right speed, properly protected, will make it possible to do more and better work.

G. H. RADEBAUGH.

## Keep Underground Machine Shop High and Dry

Did it ever occur to you that when driving a room that is later to be made into an underground machine shop it should be arranged so as to rise and attain such an elevation for the working floor that the bottom of the pit will be higher than adjoining workings? By so doing you are sure to have a machine shop that is always dry, one in which tools and parts are not likely to rust quickly, and where the workmen do not develop rheumatism.

In building the shop all the coal and 10 or 12 ft. of the roof may be removed. With this arrangement the floor can be elevated and still the necessary headroom will be afforded. The machine shop will be approached in this case

by an inclined track resting on bents. Some will prefer to leave most of the coal in place and grade up on it.

The first of these schemes was used in constructing the underground machine shop shown in the accompanying illustration. Both present fire hazards if concrete is not used extensively. The safest and best way is to take out all the coal and brush as much of the roof as is needed to give the necessary headroom, using the roof material in grading to the desired elevation.

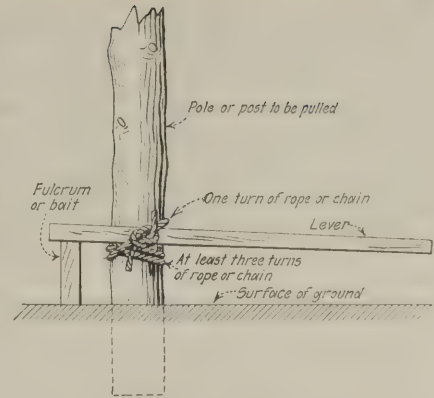
## Chain Round Pole Enables Levers to Lift It

Every once in a while about the mines it becomes necessary to pull up a pole, post, stake or pile. Of course several devices such as a jack or tools made especially for the purpose may be employed. As a rule, however, simpler and more inexpensive means may be used.

In the accompanying illustration is shown an extremely simple way of getting a firm hold on a pole with a lever. The attachment to the pole consists of three or more continuous loops of rope or chain. The end of any convenient lever may then be passed through one of the loops. A pull on this loop will tend to tighten the others and prevent their slipping. Of course the lever may be arranged as shown or the fulcrum may be placed between the operator and the pole so that a downward pressure on the end of the lever is required to lift the pole.

If many poles are to be pulled it may be advisable to make, say, two levers, two chains and a series of fulcrums or baits. On the other hand two levers may be used on the same pole simultaneously, one hitching being placed below the other. When the pole has been raised as far as the levers and hitchings will permit it may be held in position by one lever while the other hitching is slacked off and slipped down for a new hold. The pole may then be held by the other lever while the second hitching is readjusted.

As a rule, chain is to be preferred to



Gives Firm Grip on the Pole

At least three turns of rope or chain are taken around the pole. Two of these are pulled up tight and the lever is passed through the third. Lifting on the lever tightens the parts on the pole causing them to grip it securely.

rope for making the hitchings. This may be of either the curb or "log chain" type, some people preferring one and some the other. An old wagon tongue makes an excellent lever for pulling large poles, and for ordinary fence posts or those of similar size a crow bar or piece of drill steel answers every purpose. In wet or marshy land punching a hole down through the ground close beside the post with a crowbar or rod will let the air down to the bottom of the post and make the pulling easier.

## Let Batteries Ventilate and Pump Idle Mine

"The old story that a fleet of storage batteries during a suspension is a liability is certainly not true," states Joseph A. Long, assistant general superintendent and electrician of the Madison Coal Corporation at Glen Carbon, Ill., "for they are proving to be a great asset to us as our monthly payroll shows."

The Madison Coal Corporation, owning one of the largest fleets of battery-equipped locomotives in the country, recently found that, due to a shutdown of one of their mines, sixteen sets of their batteries would not be required for locomotive work.

In most mines, some work must be done whether they work or are idle. Pumps must be operated, the fans must be kept revolving and lights are needed here and there. In the sixteen sets of batteries, which were idle at this particular time, there was an abundance of electrical energy available. All that was required to utilize this energy was proper connection of the cells in series multiple to obtain the required voltage. The batteries were thus connected and this power was harnessed to the machinery which had to be kept running during the shutdown.

Mr. Long states that this unusual application of storage batteries has enabled him to close down the steam plant for 20 days at a time effecting a saving of hundreds of dollars. During this period the batteries, without requiring any recharge, furnished sufficient current to operate all pumps, fans and lights.



Underground Repair Shop with Good Drainage

In this instance the coal was removed and an incline with bents was used for the approach to the repair shop. Any water that may enter the repair pit readily drains out and the shop is kept dry, thus preserving the tools and making the place more healthful for those working in it.



## Discussion

### Commenced Rock Dusting Six Years Ago

Dust Still Visible Though Not Renewed—In Winton Have No Water and Have Used Adobe Dust for Three Years

The use of dust began in an experimental way in the mines of the Union Pacific Coal Co., about six years ago, when the manway at Reliance No. 1 was heavily dusted with adobe. Since that time, no additional adobe has been placed in this manway, but the result of the original treatment is much in evidence, the dust having been carried on down the manway for nearly a thousand feet by the traveling of men and mules.

For the past three years at this company's mines at Winton, Wyo., it has been necessary to resort to the use of adobe dust as a protection from coal dust, for there is no water at Winton and the adobe dust is our only defense. In the summer of 1923, Eugene McAuliffe instructed the local management in Rock Springs to see that dust barriers were placed in all mines. This work has been carried on from that time, the barriers being filled with air-dried adobe dust, 50 per cent of which will pass a 200-mesh screen.

It has been a general practice for many years in the mines of this company to sprinkle haulage-ways, and in the gaseous mines at Hanna and Cumberland, sprinkling was carried into the faces, men being constantly employed on this work alone. At Cumberland, closed lights have been in use for nearly ten years due to the experience encountered in the operation of the property. At Hanna, closed lights have been placed in service during 1923 and 1924, at present all operations at Hanna being under closed lights.

#### DUSTING SCHEDULE ARRANGED

The experience of the bituminous mines in the United States during the past year brought about serious consideration of a general dusting and dust barrier program in the mines of this company, and for the past two months we have been engaged in a general application of sprinkling, dust barriers and adobe dust.

The arrangement of a schedule is now complete. By Nov. 1, of this year, the schedule calls for complete protection of all the mines.

1. In the panel and cross entries, water is to be used on all cutter bars on mine machines and faces are to be wet down. This wetting is to be carried to the mouth of the panel entries and to a distance of 600 ft. from the face of cross-entry work.

2. At the mouths of all panels and cross entries dust barriers containing adobe dust are to be placed. Dust barriers are also to be placed on cross entries between panels and on slopes between entries. This, of course, con-

templates a barrier in haulage ways, air courses, and manways.

3. Slopes and cross entries are being and will be covered with adobe to the depth of from one to two inches, the ribs and roof being washed down in advance of the adobe application, air courses and manways being washed down and then dusted with adobe by means of blowers. These blowers are driven by either direct connected or belted motors.

We have arranged that a specified quantity of the work be performed each month, in order that the mines will be properly protected by Nov. 1, of this year.

Analyses are being made by the Bureau of Mines' laboratory at Pittsburgh, Pa., of the adobe dust we are using. This is done that we may be sure that we are introducing no additional hazard to the health of the men underground.

A. W. DICKINSON,  
General Superintendent,  
Union Pacific Coal Co.  
Rock Springs, Wyo.

### Longwall for Streaky Coal

In the discussion of July 3, a West Virginia operator writes asking for a method of working splint coal of the following average cross section: "Hard slate top, drawslate, 10 in.; fine grade of coal, 48 in., soft slate, 4½ in.; coal, 4½ in.; mixed slate and coal, 5½ in.; coal, 11 in.; sandstone bottom. The soft slate immediately underlying the 48 in. of coal will not support the weight of an under-cutting machine of the short-wall type without the aid of steel skids, and the loader cannot be permitted to use his shovel on the bottom."

A mine having such a bed of coal should be worked by the longwall-advancing system, using the slate for the building of packs, timber cribs being inserted at short intervals. In a section of the mine, a face 100 to 150 ft. wide should be opened and the 4½-in. streak should be cut out by day-wage men with picks as far as they can reach.\* Sprags should be set every 4 or 5 ft. apart. The 4½-in. coal below the slate could then be wedged up, so as to permit the men to increase the depth of the undercut, until it is about 5 or 6 ft. in from the face of the coal. The slate should then be cleaned out, entry and gob packs should be built and the coal shot down and loaded out before the mixed bed of slate and coal is disturbed. By having long faces

\*Why not use a machine?—EDITOR.

the cut can be made more readily in the slate seam and it will be easier to lift the mixed slate and coal.

WILLIAM BARLOW, SR.  
Landgraff, W. Va.

### Walsh Does Not Oppose Trolley Locomotives

I request the courtesy of space in *Coal Age* to correct a wrong impression that may be created by the special dispatch from Scranton, Pa., June 27, published in the issue of July 3 of *Coal Age* in which reference is made to the report of the mine inspectors who investigated the explosion at the Loomis Colliery of the Glen Alden Coal Co., June 6.

The writer of the special dispatch states that:

Among local coal-mining men it is thought that the inclusion of the electric trolley locomotive as a cause of the explosion may have been written into the report by the mine inspectors to aid Secretary Walsh in his campaign against the use of electrically operated machinery in underground workings. Mr. Walsh has time and again protested against the operation of such equipment as electric trolley locomotives.

I desire to say most emphatically that I am not against the use of electrically operated machines in underground workings, but what I do oppose is the use of trolley locomotives or any other open type of electrically operated motor in sections of mines where the atmosphere may become highly explosive in a short time as a result of an interruption of the air current.

The report to which reference has been made was written by some of the best qualified men in the anthracite region, and in that report they put their own independent judgment.

JOSEPH J. WALSH,  
Secretary of Mines.  
Harrisburg, Pa.

### Should Air Space Be Used With Black Powder?

We use black blasting powder at our mines. Would it be safe to use the air-space method or to place a loose dummy on the charge? Experiments by J. F. Burgone showed that with a 2-in. drillhole 20 in. of tamping are required. I have always found that black blasting powder would give good results when tamped tight and hard. Of course with a high explosive a better quality of coal is produced by this method of charging, but would it be equally available with black blasting powder?

JOHN W. JONES.  
Altoona, Ala.

Although the reports on the cushioned method of blasting with black powder are rather limited, the Hercules Powder Co. can advise you that the few reports it has received indicate that the cushioned method of blasting is effective also with black blasting powder. The air space between the powder and the tamping probably should not be as great as with high explosives, but it would be well to try out its effectiveness in every instance.

J. H. HORLICK, JR.  
Manager Service Division.  
Hercules Powder Co.,  
Wilmington, Del.





# Production And the Market



## Strong Tone Prevails in Bituminous-Coal Trade Despite Small Volume of Business

Save for occasional nibbles in the way of scattered inquiries, tangible evidence of an early pick-up in the bituminous-coal trade is as hard to find as ever; nevertheless the unquenchable optimism evinced in certain quarters of late will not down. Actual orders are few and far between, working time at the mines is short, yet several mines in the eastern Ohio field have opened recently and preparations are going forward for further resummptions. Despite the absence of visible support for the favorable sentiment, most centers report an improvement in undertone, attributable probably to the certainty that the longer the depression lasts the more inevitable it becomes that there will be an upturn and that it will not be an evanescent flurry. Considerable strength has been imparted to this feeling of confidence by the prosperity of the agricultural industry, fine crops and increasing prices being the rule.

### Loader Scale Means More Union Coal

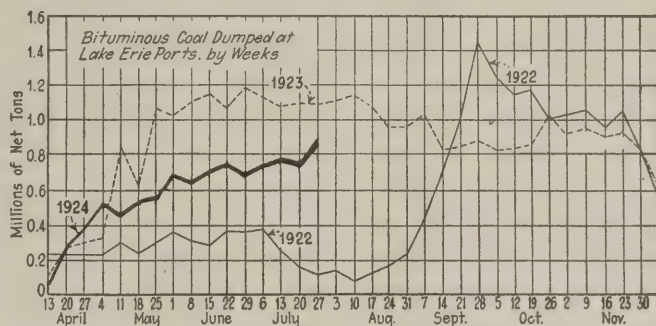
The signing of a machine-loader scale in Illinois was the outstanding event of recent weeks, presaging as it does keener competition from union operations by reason of the resultant decrease in production costs. Although a strike of cutting-machine runners has delayed operation under the new scale, it is confidently believed that an adjustment will soon be reached, when the effect on market conditions will be watched with interest.

Coal Age Index of spot prices of bituminous coal registered no change during the last week, standing on July 28 at 163, the corresponding price being \$1.98.

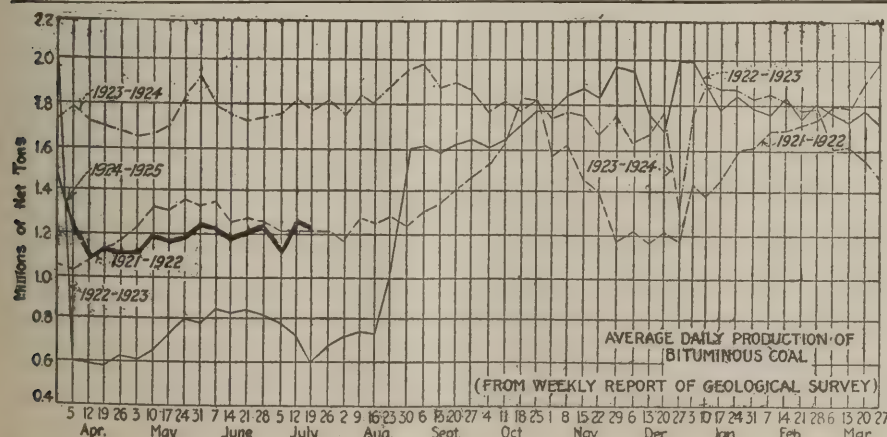
There has been a falling off in activity at Hampton Roads, dumpings of coal for all accounts during the week ended July 24 totaling 343,060 net tons, a decline of 30,540 tons from the preceding week, when 373,600 net tons was handled. The movement of coal to the lakes is proceeding pretty much in its accustomed groove for this season, dumpings at Lake Erie ports during the week ended July 27, according to the Ore &

Coal Exchange, being as follows: Cargo, 785,817 net tons; fuel, 43,443 tons. The totals for the previous week were 733,634 net tons of cargo coal and 41,667 tons of fuel coal.

Production of bituminous coal reacted slightly during the third week in July, output during that period, according to the Geological Survey, totaling 7,403,000 net tons, compared with 7,502,000 net tons during the preceding week, according to revised figures. Anthracite production also fell off during the week ended July 19, 1,840,000 net tons having been turned out, a decrease of 31,000 tons from the previous week.



While anthracite production is holding up well not much of it is finding its way to the consumer's bin, as the demand in the leading markets is sluggish for both domestic and steam sizes. A fair movement to New England is aiding materially in maintaining independent prices, though concessions have been necessary in some instances to keep tonnage moving. Stove continues to command top prices, 25 to 50c. being lopped off when egg or chestnut is taken with it. Pea moves slowly, if at all, much of it going into storage piles, and buckwheat is markedly draggy. Retail yards are well filled, consumers evincing scant interest in next winter's coal requirements.



### Estimates of Production

(Net Tons)			
BITUMINOUS			
	1923	1924	
July 5.....	8,742,000	5,738,000	
July 12 (a).....	10,925,000	7,502,000	
July 19 (b).....	10,676,000	7,403,000	
Cal. yr. to date (c)...	301,154,000	246,859,000	
Daily average to date	1,772,000	1,453,000	
ANTHRACITE			
July 5.....	1,580,000	1,296,000	
July 12.....	2,051,000	1,871,000	
July 19.....	2,005,000	1,840,000	
Cal. yr. to date.....	56,805,000	50,632,000	
COKE			
July 12 (a).....	366,000	106,000	
July 19 (b).....	361,000	105,000	
Cal. yr. to date (c)...	11,105,000	6,387,000	

(a) Revised from last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.



### Midwest Improves Slowly

No great change in the coal market was noticeable throughout the Midwest region during the past week. A slight but steady improvement of tone, especially in the country trade, made itself felt here and there. The main disadvantage of this is that it makes too many operators hanker to reopen closed-down mines, thus killing the new flower with overcultivation. This has been going on so persistently for several days that the contemplated increase in the price of Illinois domestic sizes Aug. 1 has been given up. There is very little likelihood of any change in circulars. Smokeless and anthracite domestic business continues sluggish.

Railroads continue taking a little coal steadily on low-price contracts—many of them short-time agreements—but other steam business is slow.

Running time throughout the fields of southern and central Illinois has been so short during the week that "no bills" have increased somewhat. Southern Illinois screenings now hardly ever top \$1.75, although not much moves at less than that. There is much suffering among miners and their families. No field in Illinois is in even fair condition. A little railroad and small industrial and domestic trade are all there is.

In St. Louis domestic trade is still flat. Anthracite and coke storage, usually definitely on the pick-up by this time of year, remain slow. There is a little tonnage moving in the cheaper grades for current use where gas is not available. Steam business in the city, both wagonload and carload, is quiet. The only life is shown in country domestic, and this is little enough. There are no changes in prices worthy of note.

### "Slightly Better" in Kentucky

The coal trade in Kentucky is admitting slightly better business, but kicking on prices. The retailers are buying sparingly, for immediate needs only, and total production of prepared coal is still low enough to prevent any overproduction of screenings, which means that there is no cause for advancing prepared prices or lowering screenings. The fact that lake movement hasn't been as heavy as anticipated has curtailed overproduction of eastern Kentucky screenings. However, eastern Kentucky has been producing a considerable amount of coal in the Elkhorn or Northeastern fields, along with the Hazard and Harlan regions, all of which show good operating time.

Although there has been a good deal of wage reduction in eastern Kentucky fields, it must be admitted that prices are quite low for this season of the year. Peak prices are

## Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern		Market Quoted	July 30 1923	July 14 1924	July 21 1924	July 28 1924†
Smokeless lump.....	Columbus....		\$5.85	\$3.85	\$3.85	\$3.75@ \$4.00
Smokeless mine run.....	Columbus....		3.00	2.20	2.20	2.00@ 2.25
Smokeless screenings.....	Columbus....		2.80	1.30	1.30	1.20@ 1.40
Smokeless lump.....	Chicago....		6.10	3.60	3.85	3.75@ 4.00
Smokeless mine run.....	Chicago....		3.60	1.85	1.85	1.75@ 2.00
Smokeless lump.....	Cincinnati....		5.75	3.75	3.75	3.75@ 4.00
Smokeless mine run.....	Cincinnati....		3.35	1.80	1.80	1.75@ 2.00
Smokeless screenings.....	Cincinnati....		3.00	1.35	1.35	1.25@ 1.50
*Smokeless mine run.....	Boston.....		5.45	4.30	4.30	4.25@ 4.40
Clearfield mine run.....	Boston.....		2.35	1.80	1.85	1.45@ 2.30
Cambria mine run.....	Boston.....		2.85	2.20	2.15	2.00@ 2.60
Somerset mine run.....	Boston.....		2.60	1.95	2.00	1.65@ 2.40
Pool 1 (Navy Standard).....	New York....		3.35	2.70	2.70	2.50@ 2.90
Pool 1 (Navy Standard).....	Philadelphia..		3.45	2.80	2.80	2.60@ 3.00
Pool 1 (Navy Standard).....	Baltimore....					
Pool 9 (Super. Low Vol.).....	New York....		2.75	2.10	2.05	1.90@ 2.25
Pool 9 (Super. Low Vol.).....	Philadelphia..		2.60	2.15	2.15	1.95@ 2.35
Pool 9 (Super. Low Vol.).....	Baltimore....		2.40	1.85	1.90	1.90@ 2.00
Pool 10 (H.Gr. Low Vol.).....	New York....		2.25	1.80	1.80	1.65@ 2.00
Pool 10 (H.Gr. Low Vol.).....	Philadelphia..		2.15	1.75	1.75	1.65@ 1.90
Pool 10 (H.Gr. Low Vol.).....	Baltimore....		2.25	1.65	1.70	1.65@ 1.75
Pool 11 (Low Vol.).....	New York....		2.00	1.55	1.55	1.35@ 1.75
Pool 11 (Low Vol.).....	Philadelphia..		1.85	1.45	1.45	1.35@ 1.60
Pool 11 (Low Vol.).....	Baltimore....		2.00	1.55	1.55	1.50@ 1.60
High-Volatile, Eastern						
Pool 54-64 (Gas and St.)....	New York....		1.80	1.50	1.50	1.35@ 1.65
Pool 54-64 (Gas and St.)....	Philadelphia..		1.80	1.50	1.50	1.40@ 1.60
Pool 54-64 (Gas and St.)....	Baltimore....		1.70	1.45	1.45	1.40@ 1.50
Pittsburgh so'd gas.....	Pittsburgh....		2.65	2.40	2.40	2.30@ 2.50
Pittsburgh gas mine run.....	Pittsburgh....			2.10	2.10	2.00@ 2.25
Pittsburgh mine run (St.)....	Pittsburgh....		1.95	1.85	1.85	1.75@ 2.00
Pittsburgh slack (Gas).....	Pittsburgh....		1.45	1.20	1.25	1.20@ 1.25
Kanawha lump.....	Columbus....		3.00	2.10	2.10	2.00@ 2.25
Kanawha mine run.....	Columbus....		1.85	1.50	1.45	1.35@ 1.60
Kanawha screenings.....	Columbus....		1.10	1.00	1.00	1.00@ 1.20
W. Va. lump.....	Cincinnati....		3.10	2.10	2.10	2.00@ 2.25
W. Va. gas mine run.....	Cincinnati....		1.55	1.35	1.35	1.25@ 1.60
W. Va. steam mine run.....	Cincinnati....		1.55	1.35	1.35	1.25@ 1.60
W. Va. screenings.....	Cincinnati....		.85	.95	.95	.75@ 1.00
Hooking lump.....	Columbus....		2.75	2.45	2.45	2.25@ 2.65
Hooking mine run.....	Columbus....		1.85	1.70	1.70	1.60@ 1.80
Hooking screenings.....	Columbus....		1.15	1.35	1.15	1.10@ 1.25
Pitts. No. 8 lump.....	Cleveland....		2.50	2.35	2.40	2.00@ 2.85
Pitts. No. 8 mine run.....	Cleveland....		1.80	1.85	1.80	1.80@ 1.90
Pitts. No. 8 screenings.....	Cleveland....		1.25	1.10	1.00	.95@ 1.15
Midwest		Market Quoted	July 30 1923	July 14 1924	July 21 1924	July 28 1924†
Franklin, Ill. lump.....	Chicago....		\$3.65	\$2.75	\$2.85	\$2.75@ \$3.00
Franklin, Ill. mine run.....	Chicago....		2.85	2.35	2.35	2.25@ 2.50
Franklin, Ill. screenings.....	Chicago....		1.65	1.70	1.70	1.60@ 1.80
Central, Ill. lump.....	Chicago....		2.60	2.35	2.35	2.50
Central, Ill. mine run.....	Chicago....		2.10	2.10	2.10	2.00@ 2.25
Central, Ill. screenings.....	Chicago....		1.35	1.65	1.60	1.60@ 1.65
Ind. 4th Vein lump.....	Chicago....		3.35	2.60	2.60	2.50@ 2.75
Ind. 4th Vein mine run.....	Chicago....		2.60	2.35	2.35	2.25@ 2.50
Ind. 4th Vein screenings.....	Chicago....		1.60	1.70	1.70	1.60@ 1.80
Ind. 5th Vein lump.....	Chicago....		2.85	2.35	2.35	2.25@ 2.50
Ind. 5th Vein mine run.....	Chicago....		2.10	2.10	2.10	2.00@ 2.25
Ind. 5th Vein screenings.....	Chicago....		1.45	1.55	1.55	1.50@ 1.65
Mt. Olive lump.....	St. Louis....		3.00	2.85	2.85	2.75@ 3.00
Mt. Olive mine run.....	St. Louis....		2.00	2.50	2.50	2.50
Mt. Olive screenings.....	St. Louis....		1.75	2.00	2.00	2.00
Standard lump.....	St. Louis....		2.55	2.15	2.15	2.00@ 2.35
Standard mine run.....	St. Louis....		1.85	1.80	1.80	1.75@ 1.85
Standard screenings.....	St. Louis....		.90	1.45	1.45	1.40@ 1.50
West Ky. lump.....	Louisville....		2.25	2.10	2.10	2.00@ 2.25
West Ky. mine run.....	Louisville....		1.60	1.60	1.60	1.50@ 1.75
West Ky. screenings.....	Louisville....		1.05	1.25	1.25	1.10@ 1.25
West Ky. lump.....	Chicago....		2.10	2.05	2.05	1.90@ 2.25
West Ky. mine run.....	Chicago....		.95	1.60	1.60	1.50@ 1.75
South and Southwest						
Big Seam lump.....	Birmingham..		3.25	3.20	3.20	3.10@ 3.30
Big Seam mine run.....	Birmingham..		1.95	1.80	1.75	1.50@ 2.00
Big Seam (washed).....	Birmingham..		2.35	2.00	2.00	1.75@ 2.25
S. E. Ky. lump.....	Chicago....		2.85	2.10	2.10	2.00@ 2.25
S. E. Ky. mine run.....	Chicago....		2.10	1.50	1.50	1.25@ 1.75
S. E. Ky. lump.....	Louisville....		2.90	2.10	2.10	2.00@ 2.25
S. E. Ky. mine run.....	Louisville....		1.75	1.55	1.55	1.35@ 1.75
S. E. Ky. screenings.....	Louisville....		1.00	.95	.95	.85@ 1.10
S. E. Ky. lump.....	Cincinnati....		3.10	2.50	2.50	2.00@ 2.60
S. E. Ky. mine run.....	Cincinnati....		1.55	1.45	1.45	1.25@ 1.75
S. E. Ky. screenings.....	Cincinnati....		.85	.90	.90	.75@ 1.10
Kansas lump.....	Kansas City..		4.00	4.50	4.50	4.50
Kansas mine run.....	Kansas City..		3.25	3.50	3.50	3.50
Kansas screenings.....	Kansas City..		2.60	2.50	2.00	2.00

\* Gross tons, f.o.b. vessel, Hampton Roads.

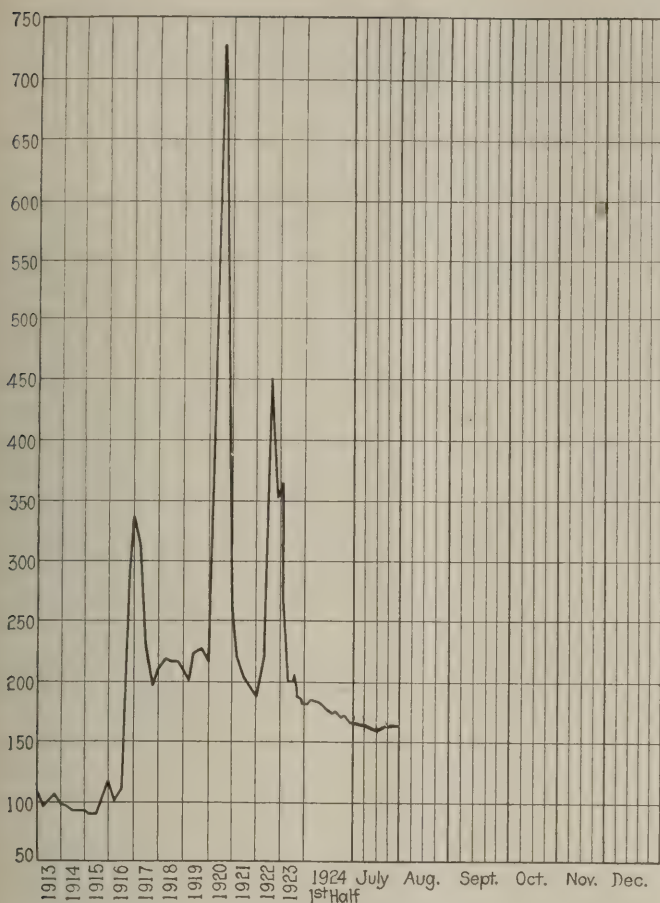
† Advances over previous week shown in heavy type, declines in italics.

## Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

	Market Quoted	Freight Rates	July 30, 1923		July 21, 1924		July 28, 1924†	
			Independent	Company	Independent	Company	Independent	Company
Broken.....	New York....	\$2.34		\$7.75@ \$8.35		\$8.00@ \$8.95		\$8.00@ \$8.95
Broken.....	Philadelphia..	2.39		7.90@ 8.10		8.80@ 8.95		8.80@ 8.95
Egg.....	New York....	2.34	\$8.50@ \$12.75	8.00@ 8.35	\$8.50@ \$9.00	8.55@ 8.95	\$8.50@ \$8.75	8.55@ 8.95
Egg.....	Philadelphia..	2.39	9.25@ 11.00	8.10@ 8.35	8.90@ 9.60	8.90@ 8.95	8.90@ 9.60	8.90@ 8.95
Egg.....	Chicago....	5.06	8.50@ 12.00	7.25@ 7.45	7.99@ 8.10	7.94@ 8.00	7.99@ 8.10	7.94@ 8.00
Stove.....	New York....	2.34	8.50@ \$13.00	8.00@ 8.35	9.00@ 9.25	8.55@ 9.20	9.00@ 9.25	8.55@ 9.20
Stove.....	Philadelphia..	2.39	9.25@ 11.00	8.15@ 8.35	9.25@ 9.90	8.95@ 9.10	9.25@ 9.90	8.95@ 9.10
Stove.....	Chicago....	5.06	8.50@ 12.00	7.25@ 7.45	8.30@ 8.40	8.24@ 8.34	8.30@ 8.40	8.24@ 8.34
Chestnut.....	New York....	2.34	8.50@ 12.75	8.00@ 8.35	8.50@ 9.00	8.55@ 9.05	8.50@ 8.75	8.55@ 9.05
Chestnut.....	Philadelphia..	2.39	9.25@ 11.00	8.15@ 8.35	8.75@ 9.70	8.90@ 8.95	8.75@ 9.70	8.90@ 8.95
Chestnut.....	Chicago....	5.06	8.50@ 12.00	7.25@ 7.45	8.08@ 8.23	8.18@ 8.24	8.08@ 8.23	8.18@ 8.24
Range.....	New York....	2.34		8.30		8.80		8.80
Pea.....	New York....	2.22	6.75@ 8.00	6.00@ 6.30	4.50@ 5.25	5.50@ 6.00	4.50@ 5.25	5.50@ 6.00
Pea.....	Philadelphia..	2.14	7.00@ 7.50	6.15@ 6.20	5.75@ 6.25	5.75@ 6.00	5.75@ 6.25	5.75@ 6.00
Pea.....	Chicago....	4.79	7.00@ 8.50	5.30@ 5.65	5.13@ 5.45	5.36@ 5.91	5.13@ 5.45	5.36@ 5.91
Buckwheat No. 1.....	New York....	2.22	2.75@ 3.50	3.50@ 4.15	2.00@ 2.50	3.00@ 3.15	1.75@ 2.50	3.00@ 3.15
Buckwheat No. 1.....	Philadelphia..	2.14	2.75@ 3.50	3.50	2.50@ 3.00	3.00	2.50@ 3.00	3.00@ 3.15
Rice.....	New York....	2.22	2.00@ 2.50	2.50	1.50@ 2.15	2.00@ 2.25	1.50@ 2.15	2.00@ 2.25
Rice.....	Philadelphia..	2.14	1.75@ 2.50	2.50	2.00@ 2.25	2.25	2.00@ 2.25	2.25
Barley.....	New York....	2.22	1.25@ 1.50	1.50	1.00@ 1.50	1.50	1.00@ 1.50	1.50
Barley.....	Philadelphia..	2.14	1.15@ 1.50	1.50	1.50	1.50	1.50	1.50
Birdseye.....	New York....	2.22	1.40@ 1.60	1.60	1.00@ 1.50	1.60		1.60

\* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.





Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

	1924		1923	
	July 28	July 21	July 14	July 28
Index .....	163	163	162	196
Weighted average price.....	\$1.98	\$1.98	\$1.96	\$2.37

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board.

around \$2.50 a ton, while the lowest quotations available are on eastern Kentucky screenings, at a low of 85c.

The western Kentucky market continues firm, with slightly better demand reported. It is said that such companies as are operating union mines are getting better production for their wage scale than at any previous time in years. It also is asserted that in some of the operating mines there are indications of private agreements and slight cutting of wage scales, while in some other mines full wage scales are paid, but only on private agreements relative to increased production per day.

Smokeless prices show signs of weakening, particularly in Western markets. Production has not been affected perceptibly, however. The price of high-volatile lump and egg also has receded in inland markets. The market for domestic coals is extremely sluggish. Upper Potomac conditions are such that there has been no change in prices on the various grades.

### Northwest Looks for Action

Little life was shown in the Duluth market during the week, except a general better feeling and a firming of prices, which is particularly noticeable. The selling movement is no better than it has been, in fact the dock men are living on hopes for the future, but they believe that two or three weeks will see an end to the inactivity. The majority of the coal which is moving from the docks now is railroad coal, and it is thought that the railroads will have their own supplies well out of the way before winter.

Anthracite is being shipped to Winnipeg from the three

Duluth docks which have rail connection with the Canadian Northern. In fact Canada is the best hard-coal customer in this market at present.

The movement to the docks picked up this week, when 37 cargoes were received, of which seven were hard coal, and 20 cargoes are reported on the way, of which five are of hard coal.

Warm weather at Milwaukee serves to check what little business the coal men have been doing of late, and the market is very dull. Country dealers are evincing some disposition to lay in stocks, but the industries are out of the market at present. Prices continue unchanged. Lake receipts have slowed up considerably. Thus far this season 347,238 tons of anthracite and 844,318 tons of soft coal have arrived at Milwaukee.

### West Does Fairly Well

A steady though slight increase in business through the Southwest presages the opening of the fall demand. Kansas strip coal, which has been selling for \$3.75 for lump, \$3.50 for nut and \$2.75 for mine run, again is quoted at the same price as shaft coal. The price of Henryetta (Okla.) coal, slashed during a recent fight among Oklahoma operators for business, has been advanced 50c., as the market improves. It now is quoted at \$4.50 for lump, \$3.75 for nut, \$3.25 for mine run and \$2 for screenings. Some operators already have increased their price for Arkansas semi-anthracite. The increase is expected to become general early in August. As a result of the uneven advance, Arkansas coal is quoted \$5.50@\$7 for lump, \$3.25@\$3.75 for mine run and \$1.75@\$2 for screenings. Kansas coal is \$4.50 for lump, \$4 for nut, \$3.25@\$3.50 for mine run and \$2.50@\$2.75 for screenings.

Reports on the Colorado coal market activities show very little change from last week. There is little demand for anything. Mines worked on an average of only sixteen hours last week and a number of them report unbilled loads on track. The operators' weekly reports show more than 50 per cent of the working time lost was attributed to "no market."

In Utah more coal is being mined and sold than a few weeks ago, but mines are still working less than three days a week. Lump is moving for domestic storage, but so are most other sizes. The principal industries buying coal are cement plants, sugar companies and metal-mining companies. Railroads are taking very little, but they are not entirely out of the market.

### Cincinnati Market Drags

Little change is to be noted in the dull and draggy condition of the Cincinnati market. Even the slack market, which showed signs of coming to life with the continued reduction in the make of prepared sizes, has settled back again. The one bright spot in the bituminous list is run of mine, which, in spite of some rough knocks recently, holds consistently and with an evidence that this, at least, has struck rock bottom. Smokeless business is of the in and out order. The end of the month finds prices hardening a little. Inquiries from steel plants and concerns with malleable requirements begin to show a better vista ahead. Retail prices are unchanged and in keeping with the mid-summer inactivity. Specialized coals are quoted as follows: Egg, \$2.25@\$2.75; block, \$3@\$3.75.

A better feeling is developing at Columbus. This is more psychological than real, as few operators or jobbers note any increase in business. While some steam consumers still have fair stocks, the amount of fuel above ground has been reduced materially. There is still a considerable quantity of demurrage coal and consequently some low quotations are heard. Contracting is not active, although an occasional agreement is being renewed. Domestic consumers are still playing a waiting game and dealers' business is rather light. Coal is moving in larger quantities to schools and municipal and county institutions. Lake trade is quiet although reports show a congestion of loaded cars between Columbus and Toledo. West Virginia mines are supplying the main tonnage for lake shipment.

A slightly improved tone has developed during the past ten days in markets served by eastern Ohio mines, output having increased. Cleveland industries, however, continue to work less than half time in many instances, and consumption of steam coal is more or less restricted. The additional tonnage consists of miscellaneous lots placed



here and there. Several mines have resumed operations in the eastern field, and retailers are becoming a little more active.

Dullness persists in the Pittsburgh market. Production is chiefly under special conditions, the coal not moving through the open market. Slack is a regular commodity, and in consequence it shows occasional slight price changes. The industrial outlook in the district appears somewhat improved.

Little improvement is noted in mining conditions in the central Pennsylvania field. For the week ending July 19 the loadings were 11,172 cars, as compared with 10,804 cars in the previous week. There are 2,000 no-bill cars reported in the district.

Trade at Buffalo is still pretty quiet. Nothing would produce good prices except a car shortage or a strike, and neither is in sight now.

### Inquiry Light in New England

In New England the outlook for steam coal continues anything but favorable. Prices are as low as, and in certain instances even lower than, at any time this season, and inquiry is relatively so light that forcing coal is still indulged in by several of the agencies. Steamer rates from Hampton Roads are about 75c. to Boston, and with this added to \$4.25 per gross ton f.o.b. vessel at Norfolk or Newport News it is easy to account for a range of \$4.35@ \$4.40 per gross ton on cars for inland distribution. The territory is being scoured for spot orders, and there is enough business to absorb what tonnage arrives.

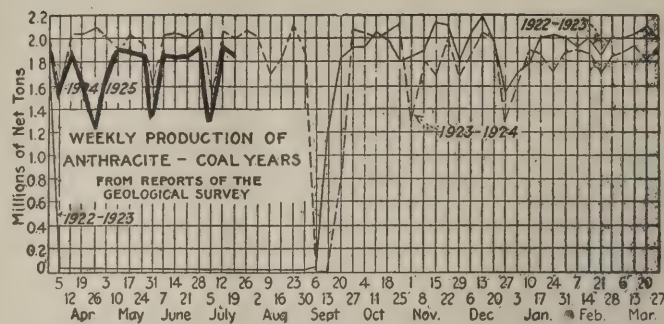
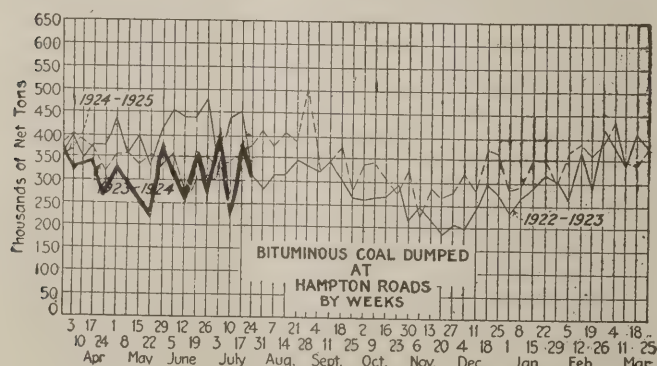
Moderate accumulations are the rule at Hampton Roads. In some quarters there is really drastic curtailment, but in others there is a disposition to chase rainbows and open the gate on the strength of sporadic sales. There are occasional commitments being made off-shore, and these together with certain staple tonnage are sufficient to keep the average movement up to the May and June level.

All-rail there is no material change. In certain of the non-union sections of central Pennsylvania there are renewed differences with labor over the wage scale and incidental problems. The undependable market is responsible for fluctuations in output, a situation that is difficult for all concerned. Prices are about as low as they can go without cutting too deeply into actual costs, and even the highest grades are being offered at figures little above those quoted for ordinary Beech Creek coals. Dumpings over the Philadelphia and New York piers continue extremely light, and except for specialties there is only a most restricted outlet for steam grades via this route. Hampton Roads shippers have very much the advantage both as to base cost and marine rates.

### Atlantic Seaboard Consumers Indifferent

Lack of interest features the New York market. There is comparatively little buying, most of the coal coming to tidewater already on contract. More coal is being shipped to the local piers than is really necessary to meet requirements, owners letting it go at figures below current quotations in order to save demurrage charges. Fading reserves and an increase in inquiries give some hope that better buying is close at hand.

Inquiries are comparatively plentiful at Philadelphia, but it is another matter to translate them into orders. Industrial conditions have not improved, yet reports are plentiful of certain textile concerns expecting to operate more fully, and some of the iron concerns also are showing hopeful signs of improvement. Prices remain firm and



practically unchanged. Tide conditions have eased again after a little flurry a week ago.

The situation at Baltimore continues dull and uninteresting, there having been practically no change for over two months, except for spasmodic periods of inquiry. The betterment of conditions hoped for with the gradual depletion of stocks has failed to materialize, and from practically all sources come complaints of general flatness in home trading. The records for the first three weeks of July show that the export trade is well in advance of that of the first three weeks of June.

Lack of a supporting market has brought production in the Birmingham district to the lowest figure recorded in many weeks, 308,000 net tons being reported for the week of July 19. There is a mere dribble of spot business being taken on. Industrial conditions are very unsatisfactory, and consequently only fuel necessary to a very restricted operation is being provided. Much of the contract domestic tonnage is being held up, as the retail market is sluggish and little coal is moving from the yards.

### Anthracite Trade Lacks Life

Demand for anthracite at the New York tidewater is almost lifeless. Retail yards are nearly filled, consumers being either on vacation or not showing any desire to fill empty bins if they are without next winter's coal supply. One shipper, commenting on the local situation, said that he had sold more than 10,000 tons of hard coal within the last week, all of which was to line customers, and that during the same period he had not sold anything at tide-water. New England continues to take its share of anthracite and this has helped to maintain quotations for independent coal on something like last week's basis, although some shippers have found it necessary to quote lower figures in order to keep tonnage moving. The better grades, however, bring the maximum prices quoted. Straight lots of stove coal are bringing top prices, but when this size is taken with either egg or chestnut, from 25c. to 50c. is taken off. Pea coal moves slowly and is being stored by nearly all operators. Producers find it difficult to dispose of the smaller coals. Buckwheat is particularly hard to move and only the very best grades bring the highest prices. Rice and barley move easier.

Philadelphia dealers' yards are filled to saturation, and many producers will find it a problem to operate in August. Buying is so slow that during the past week the lightest tonnage was moved for any similar period in the past seven years. The steam trade also is still slow, and independent shippers are moving output only at cut rates.

It is difficult to perceive any change in the hard-coal situation at Baltimore. The trade reports a dull demand, and there is little expectation of a material change for some time to come.

The Connellsville coke situation shows no change of consequence. Demand and production are extremely limited. Production of beehive coke during the week ended July 19, according to the Geological Survey, totaled 105,000 net tons compared with 106,000 tons during the previous week.

### Car Loadings, Surplusages and Shortages

	Cars Loaded—	
	All Cars	Coal Cars
Week ended July 12, 1924.....	910,415	146,177
Previous week.....	759,942	111,458
Week ended July 12, 1923.....	1,019,809	193,922
	Surplus Cars—	
	All Cars	Coal Cars
July 14, 1924.....	355,720	169,697
Previous week.....	359,191	169,607
July 14, 1923.....	84,210	5,865
		Car Shortage
		4,574
		2,700



## Foreign Market And Export News

### British Coal Markets Unsettled; Output Passes 5,000,000 Tons

The Welsh steam coal market is still very unsettled and business on the whole is poor. Buyers both at home and abroad are extremely cautious and a state of great uncertainty is plainly evident. A depreciation in the reparation currencies is reflected in a falling off of the European demand, and business in South America is getting more and more difficult to obtain. Many domestic buyers and coaling stations are buying very slowly, anticipating a fall in the prices of the best coals.

The inquiry in Newcastle for best steams and gas coals has improved a little over last week, but the remainder of the market is stagnant. Supplies are abundant and many pits in the Durham area are on short time in consequence. There are no contracts worth reporting. Buyers who desire prompt deliveries are obtaining concessions.

The output of the British coal mines during the week ended July 12, a cable to *Coal Age* states, was 5,002,000 tons, according to the official reports. This compares with 4,988,000 tons produced during the week ended July 5.

### Trade at Hampton Roads Weak In All Branches

Business at Hampton Road is poor, with the market weak and buyers rare. The Raleigh Smokeless Coal Co. has renewed its old contract for South American shipments, chartering vessels to make deliveries, which were figured about \$4.25-\$4.35 f.o.b. piers.

Spot export business is almost non-existent and bunkers and coastwise trade have reached a low level. The trade had expected dullness in bunkers and coastwise, but there is some disappointment at the falling off in foreign business.

Movement of South American coal constitutes the bulk of the activity, although a few cargoes are going to Canada and other nearby countries.

The tone of the market is weak, and the trade is not optimistic over the immediate future.

### United States Domestic Coal Exports During June

	(In Gross Tons)	1923	1924
Anthracite.....		418,594	349,134
Value.....		\$4,504,939	\$3,785,798
Bituminous.....		2,418,769	1,513,899
Value.....		\$12,653,967	\$6,145,836
Coke.....		63,841	48,238
Value.....		\$680,325	\$391,569

### TWELVE MONTHS ENDED JUNE

Anthracite.....	3,733,714	3,930,794
Value.....	\$40,691,885	\$43,173,035
Bituminous.....	15,953,879	17,200,245
Value.....	\$97,623,225	\$85,160,910
Coke.....	967,272	713,546
Value.....	\$10,645,522	\$6,582,238

### Industrial and Domestic Trade Slow in French Coal Market

Industrial coal is plentiful, due to slackening of demand. British coals, although weaker at the shipping docks, are more expensive than the French product on account of the rate of exchange. The volume of orders for household coals at the mines is good, but dealers report the consumer demand weak save for a slight flurry toward the end of the month.

Deliveries of indemnity fuels during June to the Office des Houillères Sinistrées for France and Luxemburg consisted of 201,970 tons of coal, 537,517 tons of coke and 26,908 tons of lignite briquets, a total of 766,395 tons. Receipts were larger than during the previous month but still much lower than before the strike.

The O.R.C.A. is receiving coke at an average rate of 16,174 tons daily. The price of coke remains at 150.75 fr. frontier station Sierck (all O.R.C.A. charges included).

Production by French mines during May consisted of 3,615,910 tons of coal, 76,890 tons of lignite, 220,100 tons of coke and 242,732 tons of patent fuel, a total of 4,155,542 tons. This compares

with April output of 3,565,225 tons of coal, 75,572 tons of lignite, 215,056 tons of coke and 250,908 tons of patent fuel, making a total of 4,106,761 tons.

### Export Clearances, Week Ended July 26, 1924

#### FROM HAMPTON ROADS

	Tons
For Brazil:	
Br. Str. Polcevera for Rio de Janeiro.....	11,220
Jap. Str. Chifuku Maru for Rio de Janeiro.....	6,900
Br. Str. Tritonia for Rio de Janeiro.....	6,240
Br. Str. Atalaja for Para.....	5,863
For Italy:	
Ital. Str. Stromboli for Naples ..	7,289
Span. Str. Aritz Mendi for Porto Ferrajo.....	7,205
Ital. Str. Kamarima for Savona.....	3,816
Ital. Str. Vincenzo Florio for Genoa.....	9,330
For Newfoundland:	
Nor. Str. Betty for Argentina....	3,418
For.....	
Nor. Str. Marita for Boca Chica.....	495
Nor. Str. Tosto for Boca Chica.....	488
For Porto Rico:	
Amer. Str. Margaret for San Juan.....	4,793
For Nova Scotia:	
Fr. Str. Libourne for Three Rivers.....	5,825
Ital. Str. Volturmo for Three Rivers.....	7,273
For Dutch Guiana:	
Amer. Schr. Charles Whittemore for Paramaribo.....	1,023
For Prince Edward Island:	
Br. Str. Maraval for Georgetown.....	1,044
For Cuba:	
Br. Str. Ryburn for Cienfuegos.....	2,541
For Panama:	
Nor. Str. Fram for Guanico ....	3,921
For West Indies:	
Nor. Str. Dea for Port Castries.....	2,732

#### FROM BALTIMORE

For Italy:	
Ital. Str. Pollenzo.....	8,853
Ital. Str. Giovanni Florio.....	7,316

#### FROM PHILADELPHIA

For Newfoundland:	
Dutch Str. Ubbergen, for St. John's.....	—

### Hampton Roads Pier Situation

	July 17	July 24
N. & W. Piers, Lamberts Pt.:		
Cars on hand.....	1,228	1,228
Tons on hand.....	75,026	73,424
Tons dumped for week.....	139,975	124,979
Tonnage waiting.....	20,000	5,000
Virginian Piers, Sewalls Pt.:		
Cars on hand.....	1,429	1,516
Tons on hand.....	99,450	107,100
Tons dumped for week.....	109,560	75,513
Tonnage waiting.....	7,086	2,500
C. & O. Piers, Newport News:		
Cars on hand.....	2,164	1,947
Tons on hand.....	105,830	97,353
Tons dumped for week.....	84,037	105,811
Tonnage waiting.....	4,260	7,430

### Pier and Bunker Prices, Gross Tons

	PIERS		
	July 19	July 26†	
Pool 9, New York.....	\$4.75@5.00	\$4.75@5.00	
Pool 10, New York.....	4.50@ 4.75	4.50@ 4.75	
Pool 11, New York.....	4.25@ 4.50	4.25@ 4.50	
Pool 9, Philadelphia.....	4.70@ 5.00	4.70@ 5.00	
Pool 10, Philadelphia.....	4.45@ 4.70	4.45@ 4.70	
Pool 11, Philadelphia.....	4.30@ 4.50	4.30@ 4.50	
Pool 1, Hamp. Roads...	4.20	4.20@ 4.25	
Pool 2, Hamp. Roads...	4.10	4.10@ 4.15	
Pools 5-6-7 Hamp. Rds.	4.00	4.00	

#### BUNKERS

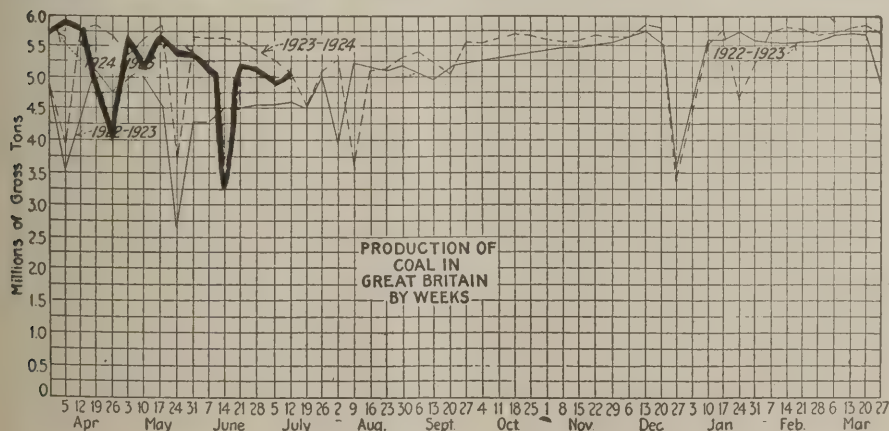
Pool 9, New York.....	5.00@5.25	5.00@5.25
Pool 10, New York.....	4.75@5.00	4.75@5.00
Pool 11, New York.....	4.50@4.75	4.50@4.75
Pool 9, Philadelphia.....	5.00@5.30	5.00@5.30
Pool 10, Philadelphia.....	4.75@4.95	4.75@4.95
Pool 11, Philadelphia.....	4.50@4.70	4.50@4.70
Pool 1, Hamp. Roads.....	4.25	4.20@4.25
Pool 2, Hamp. Roads.....	4.10	4.10@4.15
Pools 5-6-7, Hamp. Rds.	4.00	4.00

### Current Quotations British Coal f.o.b. Port, Gross Tons

#### Quotations by Cable to *Coal Age*

	July 19	July 26†
Admiralty, large..	28s.@28s.6d.	28s.@28s.6d.
Steam smalls.....	18s.	16s.6d.@17s.
Newcastle:		
Best steams.....	19s.@19s.6d.	20s.6d.@21s.
Best gas.....	23s.@23s.6d.	21s.6d.@22s.6d.
Best bunkers.....	19s.@21s.	21s.@21s.6d.

† Advances over previous week shown in heavy type, declines in italics.







## News Items From Field and Trade



### ALABAMA

Several of the big coal-mine owners of the Birmingham district are contemplating the general use of limestone dust for sprinkling in the mines to minimize the dangers of coal-dust explosions.

Preparations are under way for the fall meeting of the American Institute of Mining and Metallurgical Engineers, which will be held in Birmingham, Oct. 13-15. Several interesting papers are being prepared by coal-mine executives and engineers covering mining methods used in this district and the process of washing and preparing coal for the market and for use in coke manufacture.

### COLORADO

The Alamo Coal Co. is about to begin the erection of 21 buildings at its plant near Walsenburg.

The Three Pines Coal Co., of Val-lorso, employing about 80 men, has filed with the State Industrial Commission a notice that it purposes cutting wages 25 per cent Aug. 1. The men were expected to file a protest which would result in a commission hearing.

### ILLINOIS

The Sunnyside mine near Herrin is shut down again. This time the tie-up is because of an argument over the payroll. The Burton Coal Co. took over the mine during June after Anderson & Roberts had failed to meet pay-rolls during May. The miners claimed a total of \$51,000 was due them. The Burton Coal Co. made an agreement with the men and the mine resumed. But after July 15 the men refused to work longer, asserting that the Burton company had not fulfilled the agreement.

Practical tests of Prof. S. W. Parr's process of coking Illinois coal have been started at the University of Illinois, at Urbana. First-run tests, it is believed, will demonstrate the effectiveness of his low-temperature process and prove that Illinois coal can be made into coke by that method.

The movement for greater mine safety in Illinois may be advanced by the activity which grew out of a regional safety meeting held in St. Louis, Mo., in June under the direction of the National Safety Council. A committee appointed then by D. D. Wilcox, of the Superior Coal Co. of Gillespie, met July 17 in Springfield to plan the next step toward a new state-wide safety council.

The Governor will be asked to call an Illinois mine safety meeting in November. An executive committee to be in charge of the meeting is headed by Martin Bolt, director of the State Department of Mines and Minerals. W. D. Keefer, of the National Safety Council, is secretary. Mr. Bolt has not yet appointed the other members.

Fire of unknown origin recently caused damage of approximately \$15,000 at the Kelly No. 4 mine of the United States Fuel Coal Co., located east of Westville, and about ten miles southeast of Danville. The fire destroyed the boiler room, engine room and the tipples. This mine has been a big producer for nearly twenty-five years. The mine was sunk in 1901 and operated continuously, except for brief shutdowns, until May 22, 1924, when the mine was closed. The mine for years gave employment to about 650 men.

### INDIANA

The coal properties of the New Discovery Coal Co. and the Parke County Central Coal Co., both located in Parke County, will be sold at a receiver's sale soon. The properties consist of leases on more than 500 acres of semi-block coal, shafts, tipples, buildings, boilers, engines, machinery, cars, scales, tools and other mine equipment. The Rockville National Bank is receiver for the two companies.

The controversy between Terre Haute miners and the Chicago, Milwaukee & St. Paul R.R. over the Blackhawk miners' train will be heard soon by the Indiana Public Service Commission. The trouble began four years ago, when the service commission issued a ruling regarding a miners' train to be run between Terre Haute and Blackhawk to accommodate miners. The ruling then said when a train should leave each terminal. The railroad followed these instructions until work became dull, when it attempted to change the schedule to three days a week. The union lodged a complaint. Three weeks ago the railroad issued an order that the train be discontinued altogether and that the miners' coaches be attached to the early morning and evening trains operating between these points. Again the miners objected.

Stripping mines in Pike County are being worked nearly every day while the shaft coal mines are operating only two and three days a week. The Indiana strip-pit operators are said to be meeting Kentucky competition successfully. It is reported that more than 2,000 miners in Pike County, unable to

work sufficiently at their regular vocations, have turned to others, saying they intended quitting the mines for all time.

A total of 12,289,296 tons of coal was mined in Indiana in the first half of the fiscal year of 1924, according to a report by Cairy Littlejohn, chief state mine inspector. The report shows that \$20,932,231 in wages was paid to Indiana miners during this period. The total amount of wages for all the last fiscal year was \$45,920,877. The number of employees for the first six months of the present year, as shown in the report, totals 23,861, as compared with 31,189 for all of last year, a sharp reduction reflecting the low output of the Indiana fields.

### KANSAS

William S. Anderson, vice-president of the McGrath Coal Co., suffered a fractured arm, several fractured ribs and severe bruises when he slipped and fell from the top of a 12-ft. tank at the company's mine near Pittsburg July 15.

Two of the large companies of the Kansas coal field have departed from the long followed custom of paying the miners cash. The Western Coal & Mining Co. and the Clemens Coal Co. are now paying by check to avoid the danger of payroll robberies. Checks are distributed two or three days earlier than the regular pay day.

The Western Coal & Mining Co.'s Mine No. 20, West of Arma, set a new state record for shaft-mine coal production July 15 with 1,529 tons for an eight-hour period. J. D. Delaney, superintendent of the Western, said he hopes to climb to the 2,000-ton mark. The former high mark in this district for an eight-hour period was 1,446 tons, held by a mine of the Central Coal & Coke Co. Western No. 20, which is 215 ft. deep, is equipped with the latest machinery and employs about 300 men.

### MINNESOTA

The Great Northern Ry. has started a series of tests of the use of lignite used in powdered form and dried and blown into the firebox all at one operation. The tests are being made at the Dale Street shops in St. Paul, Minn. Including all in one operation, eliminates the need of storing the pulverized fuel and does away with the danger of explosion. If the tests prove a success, the method probably will be adopted at the company's shops in North Dakota and eastern Montana. The tests may include locomotives.





Courtesy U. S. Distributing Corp.

### Mining Village of Dietz, Wyo., Sheridan-Wyoming Coal Co.

An unusual quantity of foliage for Wyoming is to be seen in yards of these houses, which as will be noticed have only one story.

## MISSOURI

The St. Louis office of the Bureau of Mines was discontinued on July 1, 1924. C. E. Van Barneveld, superintendent of the Mississippi Valley Station, Rolla, Mo., with which the St. Louis office was connected, has resigned. B. M. O'Harra is acting as superintendent of the Rolla Station.

The Missouri Public Service Commission on July 21 issued an order denying the application of the West Missouri Power Co. for authority to purchase stocks and bonds of the Fort Scott & Nevada Light, Heat & Power Co. and coal mines and equipment belonging to the Clinton Coal & Mining Co. It proposed to purchase \$800,000 par value common stock of the Fort Scott & Nevada company and \$450,000 par value of its first mortgage bonds for \$645,000 and the mines, equipment, etc., of the coal-mining company for \$200,000. The commission held that the purchase price was excessive compared with the value of the property to be purchased.

## NEW YORK

The Pennsylvania Coal & Coke Corporation reports a deficit before federal taxes, for June of \$54,595, as compared with net earnings of \$32,685 for June, 1923. The deficit, before federal taxes, for the six months totaled \$141,108, as against net earnings of \$582,000 for the corresponding period last year. The six months' gross was \$3,030,855, as compared with \$4,558,389. The company declared the regular quarterly \$1 dividend, payable Aug. 11 to stock of record Aug. 5.

The Virginia Iron, Coal & Coke Co. reports a net loss of \$51,199, after interest and taxes for the quarter ended June 30, 1924. This compares with a net income of \$5,792, equal to 11c. a share, earned on the \$5,000,000 preferred stock in the preceding quarter and a net income of \$114,984, or 52c. a share, earned on the common stock

in the second quarter last year. For the first six months of 1924 the net loss amounted to \$45,406, as compared with a net income of \$358,543, or \$2.33 a share on the common stock, in the first half of the previous year.

## OHIO

The Southern Ohio Coal Exchange reports for the week ending July 12 an output of 79,370 tons from 439 mines in the southern Ohio field. The full-time capacity was 645,430 tons which leaves a shortage of 566,370 tons. Labor shortage caused a loss of 3,995 tons; strikes, 8,580 tons; mine disability, 4,180 tons and "no market" 549,305 tons. During the same week the eastern Ohio field ordered 10,650 cars and loaded 7,739 cars.

The M. A. Hanna Co., Cleveland, which operates iron-ore mines, anthracite and bituminous-coal mines, announces the issue as of Aug. 1 of \$7,000,000 ten-year sinking-fund gold debentures. This is part of an authorized issue of \$15,000,000 and will be a direct obligation of the company. The debentures are being marketed by Dillon, Read & Co., New York City, and the Union Trust Co., Cleveland. The introductory price is 98½ and accrued interest, to yield more than 6.20 per cent.

Plans are being formulated for the state safety meet at Bellaire, Aug. 16, when a campaign will be started to eliminate accidents in coal mining and allied industries. Manufacturers are invited to attend the demonstrations, and invitations are being prepared by the Bellaire Chamber of Commerce, the city's mayor, the United Mine Workers of America and Joseph A. Holmes Safety Association. Exhibits in safety and accident prevention work deal not only with the coal-mining industry, but will be of interest to all employers of labor.

The Hocking Valley R.R. was compelled on July 22 to place a temporary

embargo on the movement of lake coal onto its lines, owing to the fact that between Columbus and Toledo there are over 5,000 loaded cars awaiting handling at the Toledo docks. The congestion of the coal, an unusual condition for this season of the year, is due to the withdrawal of several boats ordinarily used in transporting coal to the upper lakes. This coal is coming from the non-union mines of West Virginia and Kentucky. Practically no coal is moving from southern Ohio mines to the upper lakes.

## PENNSYLVANIA

The H. C. Frick Coke Co. is very materially increasing output from the three Colonial mines at Grindstone and Smock, from which plants the coal is transported on a five-mile belt conveyor system to the Monongahela River. The Hillman Coal & Coke Co. has closed down indefinitely the Pike Mine, a union operation near Brownsville, on the edge of the coke region, but is increasing shipments from its non-union operations, where the wage scale has been reduced.

The departure of S. J. Phillips, of Scranton, for a trip abroad makes five vacancies among mine inspectors in the hard-coal fields, four having died. Mining companies, asked by the Governor and the state mine chief to cut down accidents, will not get the same inspection precautions from a depleted corps.

Because the officials of the Evans Colliery Co. at Beaver Meadow refused to dismiss Frank Satechick, of that town, a locomotive engineer, who, it is alleged, refused to pay a union fine of \$50, two hundred men went on strike.

Increased taxes paid by the Quemahoning Coal Co. for the year 1922 on mineral holdings in Jenner township, Somerset County, will be refunded under a decision of the Pennsylvania Superior Court handed down on July 3, in which the Somerset County Court was reversed. The decision also affects a number of other coal companies holding land in Jenner township. Two years ago, in making the triennial assessment, valuations on coal holdings were materially increased. Some 1,500 appeals were taken and subsequently the County Commissioners revised the assessments downward. The road supervisors and school directors, however, used the higher valuations as certified by the County Commissioners. Legal proceedings were started to prevent the collection of the higher taxes and the Somerset County Court decided in favor of Jenner township. The superior court has reversed this decision. The decision in the Quemahoning case will affect a large number of other cases in Jenner and other townships.

The Haddock Coal Co., composed of Schuylkill County, Philadelphia, New York and Wilkes-Barre capitalists, will expand its operations, it is announced. The company is the lessee of the Silver Brook workings, where an output of 3,000 tons a day is predicted when extensive development work now in progress.



ress is completed. Slopes are being sunk and machinery is arriving and being assembled for a breaker on a coal property near Youngs Landing, Pottsville.

S. D. Warriner, president of the Lehigh Coal & Navigation Co., the Alliance Coal Mining Co., the Cranberry Creek Coal Co. and the Panther Valley Water Co., announces the appointment of Edward Hughes, formerly purchasing agent, as comptroller, vice E. M. Reynolds, deceased. J. R. Bennington, formerly assistant purchasing agent, has been appointed purchasing agent, vice Edward Hughes.

Fire of unknown origin on July 20 at Claridge, a small mining town of the Westmoreland Coal Co., near Jeannette, caused the death of two children and wrought damage estimated at more than \$50,000.

Making a perfect score in the elimination contest held July 17 at the Prospect colliery, the Red Ash first-aid team of the Prospect colliery, Lehigh Valley Coal Co., won the right to represent the Susquehanna division in the annual first-aid meet of the company to be held at Hazle Park in August. Twelve teams, representing the Prospect, Henry and Dorrance collieries, were entered.

The car-repair shop at the Audenreid colliery of the Lehigh & Wilkes-Barre Coal Co. was destroyed by fire July 20. The loss is estimated at more than \$10,000.

## UTAH

The general offices of the United States Fuel Co. and its Utah coal sales agency, of which Moroni Heiner is vice-president and general manager, are now located on the tenth floor of the Newhouse Building, Salt Lake City.

## WASHINGTON

William Shaw, formerly superintendent of the Roslyn Fuel Co. mines at Jonesville, has entered the mine supply business at Seattle. Robert Scobie, Jr., of Cle Elum, is the new mine superintendent at Jonesville.

It is expected at Buckley that the new Black Carbon mine, near there, will begin producing coal during August. The tippie is nearly finished and underground development, from a 35-per cent slope, is extensive enough to justify an output of 300 tons a day during the winter.

## WEST VIRGINIA

The Board of Directors of the Consolidation Coal Co. has declared a quarterly dividend of \$1.50 per share on its common capital stock, payable July 31, 1924, to the holders thereof at the close of business July 15, 1924. The transfer books will remain open. Dividend checks will be mailed.

In the second annual inter-mine first-aid meet of the Bethlehem Mines Corporation the Masontown team won the contest. There were teams from five different mines entered in the contest. Composing the Masontown team

were J. C. Everly (captain), Harry C. Brown, Carl Watson, T. E. Titchwell and W. N. Williams. The Bretz team composed of Edward J. House, captain, Arlie House, Edward Booley, Rex Doddridge and Guy Shuck, took second place. The Masontown team, which wins the district cup, will go to Johnstown, Pa., to participate in the company's general safety meet and will later participate in the state meet at Wheeling. The Masontown girls' team won the girls' contest. The girls' team includes Zeda Snyder (captain), Virginia DeBass, Madaline McCall and Sarah Cornelius.

So many former employees have violated a recent injunction obtained by the Brady-Warner Coal Corporation that the corporation has caused to be issued an order summoning nineteen men living at Brady and in that vicinity to appear before Judge I. G. Lazelle to show cause why they should not be adjudged guilty of contempt of court for violation of the injunction issued by Judge Lazelle on May 23. Three men who were arrested on June 25 for violation of the injunction have been released with the understanding that they will present themselves before the court when ordered to do so.

R. M. Lambie, chief of the State Department of Mines, has announced a number of meetings for the purpose of talking over safety measures and getting suggestions as to changes that may be necessary in the mining laws to make them conform to modern mining methods. All suggestions are to be compiled and carefully gone over by a commission appointed by the Governor for that purpose. The meetings will be held at the following places at 2 p.m. on the dates mentioned: Beckley, High School building, Aug. 1; Welch, school building, Aug. 12; Logan, High School building, Aug. 15; Wheeling, High School building, Sept. 3. A meeting was held in the Fairmont Hotel, Fairmont, July 23 and at Central Junior High School, Charleston, July 29.

## CANADA

An explosion at the Allan shaft of the Acadia Coal Co.'s mine at Stellarton, N. S., recently killed four men and injured several others. There were 74 men in the mine when the explosion occurred. Sixty three were in the shaft and escaped without difficulty. Eleven men were behind the barrier formed by a cave-in following the explosion, which occurred on the 1,200-ft. level. After four had died from suffocation or from shock, the remainder were saved by breaking the fresh-air pipe line running through the shaft. A rescue party discovered an unused passage leading to the gallery where the men were imprisoned and, cutting through a thin partition of earth, released them.

John Sowards, head of the Sowards Coal Co., Ltd., Kingston, Ont., has left for Glasgow, Scotland, where he will purchase several vessels to be used in the lake coal-carrying trade in Ontario.

Forty employees of the official and clerical staffs of the Dominion Coal Co.,

Glance Bay, N. S., were cut off the company payroll July 1, and it is understood that other sweeping reductions are to be made in all departments of the company. Depression in the coal trade was the reason given.

The Dominion Government has suspended the duty of \$1 per ton upon imports of coke. The change was made at the request of the fruit farmers of western Ontario, who are anxious to preserve their surplus crops by drying them.

The Toronto Wholesale Coal Dealers' Association has been advised by the Dominion Government that the former dumping regulations which were applied against coke have been withdrawn. The duty has been revoked.

## New Companies

The Consumers Fuel Co. has just been organized by Ohio County people with a view to operating in the northern Panhandle. This company is capitalized at \$250,000, with general offices at Wheeling. Principally interested in the new concern are H. R. Stone, W. R. King, William J. Gompers, Charles J. Schuck and R. A. Breese, all of Wheeling.

The A. J. Stewart Coal Co. has been launched by men prominent in coal circles of southern West Virginia. This company is capitalized at \$150,000, its principal office being at Bluefield. Chiefly interested in the new company are A. J. Stewart, J. H. Hoge, R. L. Bailey, J. Paul Stewart and E. L. Bailey, all of Bluefield, and W. S. Wray, of Northfork.

New coal companies having a total capitalization of \$797,500 were launched in West Virginia during June, as follows: Charter Coal Co., of Morgantown, \$100,000; Byford Big Vein Coal Co., of Elk Garden, \$25,000; Consumers Fuel Co., of Wheeling, \$312,500; Troy Camp Coal Co., of Clarksburg, \$110,000; Christiana Coal Co., of Charleston, \$50,000; A. J. Stewart Coal Co., of Bluefield, with chief works in Kentucky, \$150,000; Oliver Fuel Corporation, of 902 Fox Building, Philadelphia, Pa., \$50,000.

A new company has been organized at Rutland, Ill., to operate the coal mine there. The company is incorporating with a capital stock of \$150,000. The company will be known as the Rutland Third vein Coal Co. Those forming the organization are J. L. Bane, Fred W. Sauer, Loyus Gowen, George L. Farnsworth and A. E. Butters. Rights to 1,650 acres of coal land have been obtained. About one hundred men will be employed at the opening of the mine. The third vein is reached at a depth of 525 feet. Rutland is served by the Illinois Central and the Sante Fe railroads and two hard roads as well.

## Obituary

Charles A. Wall, of St. Louis, Mo., formerly owner and operator of mines at Du Quoin, Sparta and Murphysboro, Ill., died at his home, July 23. At the time of the death he was chairman of the board of the Devoy & Kuhn Coal & Coke Co.

Joseph A. Huddleston, head of the Excelsior Coal Co., operating at Excelsior, W. Va., succumbed to an attack of heart failure at his home on Dry Fork, July 21. He was well known in southern West Virginia, as he had actively participated in civic affairs and aided in developing Welch and the territory of which it is the center.

Michael A. Snyder, 86 years old, retired coal man of Louisville and formerly head of the old Snyder & Himpell Coal Co., which dissolved some years ago, died on July 16, following a long illness. Mr. Snyder was a native of Germany, going to Louisville as a young man and starting in the coal trade. A widow and two daughters survive. He was a veteran of the Civil War.



## Traffic News

### B. & O. Seeks Federal Injunction Against Indiana Rate Cut

Alleging that reduced rates on coal established by the Indiana Public Service Commission in an order last February are unreasonable and unjustly discriminatory and in violation of the act of Congress to regulate commerce, the Baltimore & Ohio R.R. and more than twenty others have filed suit against the commission in federal court in Indianapolis seeking an injunction restraining the commission from enforcing the order. The railroad companies also seek an order restraining the commission from enforcing or attempting to enforce any fines or penalties for failure to comply with the commission's orders.

### Indiana Wants Lower Rates on 56 Central West Roads

Reductions and adjustments in freight rates on coal from Ohio, Kentucky and West Virginia mines have been asked in a complaint filed by the Indiana State Chamber of Commerce with the Interstate Commerce Commission against fifty-six railroads in central Western states. The complaint seeks to adjust rates from the mines to practically all Indiana points. The railroads named as defendants serve what is known as the Central Freight Association territory. It alleges that rates now in effect do not take into consideration competitive conditions and are discriminatory compared with rates in surrounding territory.

Cuts in Eastern coal rates were obtained for Indiana consumers last year and early this year, and the action just taken seeks to harmonize central Western rates. The new action alleges that present coal rates from the three states named were not made in accord with the conditions which exist in competitive fields, and do not take into proper consideration mileage tables and distances. An adjustment with various reductions for various sections of the state is sought.

### Hears Evidences in Tell City and Cannelton Rate Case

Arthur Mackley, Interstate Commerce Commission examiner, has just heard evidence in the Tell City and Cannelton coal-rate case against the Southern Ry. The case was filed on behalf of the Cannelton Sewer Pipe Co., of Cannelton, Ind., the United States Brick Co., of Tell City, Ind., and others. The petition seeks an order from the commission to give the Indiana Public Service Commission authority to pass on certain reduced rates. W. W. Webb, traffic manager of the sewer pipe company, testified regarding rates. He said the petitioners are seeking to have coal rates of \$1.12 a ton from Oakland City, Winslow and Francis County, Ind., and 98c. from Boonville and Chandler. The companies also are seeking reparations

amounting to about \$8,000 on rates which were fixed by the commission and defeated by an injunction issued by Judge A. B. Anderson in federal court in Indianapolis. The injunction order prevented any interference with certain rates which were in effect during the period from March 15, 1921, to April 7, 1922.

### Rates Cut to East St. Louis From Southern Illinois

Rates on coal from the "inner group" mines of southern Illinois to East St. Louis, Ill., have been ordered reduced from 90c. to 71c. and from 90c. to 80c. by the Public Service Commission of Illinois. The commission has divided the mines in the group into two zones. The 71c. rate will apply to shipments from mines within thirty miles of East St. Louis and the 80c. rate to inner group mines beyond the thirty-mile limit. There are approximately 135 mines in the inner groups and 80 per cent of the bituminous coal used in St. Louis and East St. Louis and environs comes from these mines. The mines are served by twenty railroads.

### Cut in Indiana Rates Postponed

The Indiana Public Service Commission has postponed from July 25 to Aug. 1, the date for the taking effect of the new low intrastate coal rates. The postponement was made upon the suggestion last week of Judge Samuel Alschuler, in the federal court at Hammond, Ind., in whose court the railroad companies asked an injunction against the order. Judge Alschuler suggested that if the date were postponed, he would not have to issue a restraining order to be in effect until a hearing could be held before three judges. That hearing is now in progress.

## Coming Meetings

**Western Canada Fuel Association.** Convention Aug. 5 and 6, 1924, Brandon, Manitoba, Can. Secretary, W. H. Morrison, Winnipeg, Man., Can.

**Rocky Mountain Coal Mining Institute.** Summer meeting, Aug. 7-9, Rock Springs, Wyo. Secretary, Benedict Shubart, 521 Boston Bldg., Denver, Colo.

**New York State Coal Merchants Association, Inc.,** 14th annual convention, Sept. 4-6, Stamford-in-the-Catskills, N. Y.; headquarters Churchill Hall. Executive secretary, G. W. F. Woodside, Arkay Building, Albany, N. Y.

**American Chemical Society.** Fall convention Sept. 8-11, 1924, at Ithaca, N. Y. Secretary Gas and Fuel Section, O. O. Malleis, the Koppers Co., Pittsburgh, Pa.

**Oklahoma Coal Operators' Association.** Annual meeting Sept. 11, 1924, McAlester, Okla. Secretary, A. C. Casey, McAlester, Okla.

**Association of Iron and Steel Electrical Engineers.** Annual meeting and exposition at Duquesne Garden, Pittsburgh, Pa., Sept. 15-20. Secretary, John F. Kelly, 1007 Empire Bldg., Pittsburgh, Pa.

**National Safety Council.** Thirteenth annual safety congress Sept. 29 to Oct. 3, Louisville, Ky. Managing director and secretary, W. H. Cameron, 168 No. Michigan Ave., Chicago, Ill.

**American Institute of Mining and Metallurgical Engineers.** Fall meeting, Birmingham, Ala., Oct. 13-15. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

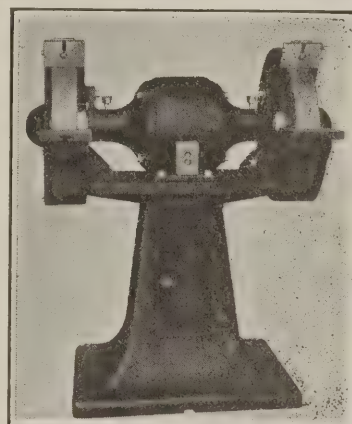
**American Institute of Electrical Engineers.** Fall convention, Pasadena, Calif., Oct. 13-17. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

## New Equipment

### Electric Grinding Outfit For Heavy Shop Work

The Cincinnati Electrical Tool Co., Cincinnati, has added to its line a 5-hp. heavy-duty floor grinder, which has been designed for use in shops where heavy grinding is required.

The motor is mounted on ball bearings and is fully inclosed to prevent emery dust and dirt from getting into the bearings and windings. The ball bearings are locked to the shaft in a manner intended to provide for end thrust and also to eliminate wear and friction. The machine will carry wheels



Heavy Electrically Driven Grinder

up to 18-in. diameter and having 3-in. face. The wheel guards are of the exhaust type complying with safety standards and are adjustable for wear of wheels. Removable covers are bolted to the guards completely inclosing the sides of the wheels, flanges and nuts to assure safety to the operator at all times.

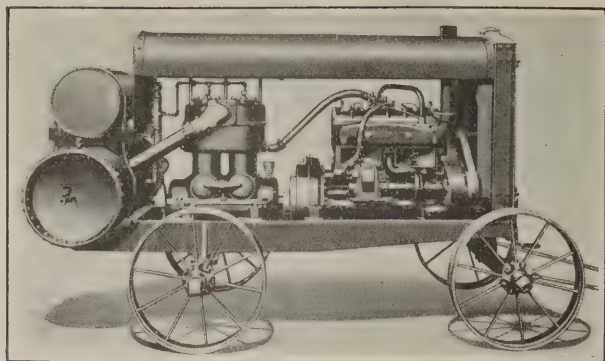
The starting switch is of the magnetic type, push-button control and is mounted accessibly on a separate panel within the column. The grinder is available for alternating current 220 and 440 volts, 25 to 60 cycles, two or three phase.

### Gasoline-Driven Compressor For Small Open-Air Jobs

It is amazing what a multitude of jobs about the mine can be performed more efficiently by the use of compressed air than by any other means. In order to meet the need for a small self-contained compressor plant capable of furnishing enough air for many of the operations about mine surface works the Ingersoll-Rand Co. has recently placed upon the market the outfit shown in the accompanying illustration.

Essentially this outfit consists of a four-cylinder, four-cycle, tractor-type gasoline engine direct-connected to a 4½x4 in. duplex air compressor having a rated capacity of 60 cu.ft. of free air per minute. Both engine and com-





### Air Compressor Plant on Wheels

For drilling in strip pits, for blowing out blast holes for operating paint sprays or sand blasts and for other surface uses for compressed air this air-compressor plant may prove handy. The air is compressed near the work and so the line loss from leakage and friction is small.

pressor are water-cooled, a fan, pump and sectionalized radiator being provided to prevent the water boiling away. Furthermore the compressor is equipped with a regulator and the engine with a control which reduces its speed during unloaded periods.

This machine has sufficient capacity to operate a jackhammer or do odd painting or cleaning jobs—operate

paint sprays or sand blasts. It will furnish air for a trench digger, two back-fill tampers, two calking or chipping hammers or one riveting hammer. It may be mounted as shown on a wagon with steel wheels and axles or upon one with wooden artillery wheels with solid rubber tires, on an automobile truck or on plain skids as the customer may desire.

### Tractor Crane That Crawls Around Sharp Corners

In the operation of the 10-ton crawling tractor shovel manufactured by the Industrial Works, Bay City, Mich., the traveling, slewing and hoisting motions are independently controlled. These motions may be utilized in a variety of combinations which are said to result in a greatly increased speed and efficiency of operation. For instance in bucket work the hoisting and slewing motions may be combined for operation at high speed and when traveling the boom may be swung in any direction to clear obstructions. By a double friction clutch and a train of bevel and spur gears the truck can be slewed in either direction without reversing the engine.

A slewing brake holds the boom securely in any position, even with a suspended load. When operating on uneven ground this brake eliminates any possibility of sudden rotation with its

usual disastrous results. The vertical slewing shaft is located accessibly at the front of the crane close to the base of the boom, and as the power is transmitted at this point no great slewing stress is carried through the revolving frame.

The new tractor crane is built for either steam, electric or gasoline power. The steam unit has two horizontal double-acting cylinders of 6-in. diameter and 8-in. stroke. The crane is extremely versatile, operating with clamshell or dragline bucket, hook and block or grapple. It is readily convertible into a shovel or pile driver, making it a general utility unit.

### Picker Segregates Slate by Selecting the Thin Pieces

Many have been the machines and mechanical devices developed during past years to pick slate from coal. Many if not most of these machines seek to utilize either the difference in

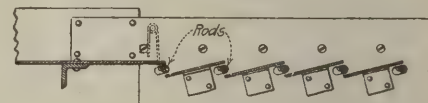
the shape of the coal and slate particles or their differing coefficients of friction. One large class of slate pickers takes advantage of the fact that slate is normally thin and flat and consequently will pass through a narrow opening while coal being of more cubical shape will not.

One of the latest machines of this type intended to be attached to an ordinary shaking screen is known as the Mason flat slates picker after its inventor Fred H. Mason, 1634 Brown Ave., Scranton, Pa. This machine, shown in the accompanying illustration, is so designed as to "clear itself," that is, free itself from slate particles too thick to pass through its openings.

Essentially this machine, consists of a stepped series of transverse plates fastened in position between side plates and forming the bed or bottom of the device over which the mixture of coal



Elevation



Section

Elevation and Section of New Picker

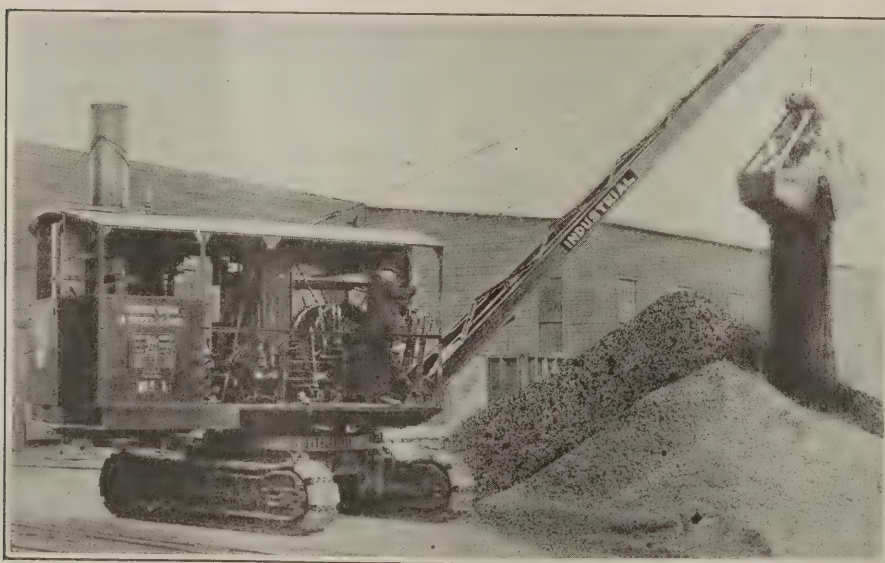
and slate slides. Between the edges of the plates and extending entirely across the shaker, rods are placed, so mounted that they may reciprocate back and forth in short slots cut in the side plates. Outside the side plates these rods are supported by, and move under the action of, springs, the tension of which tends to keep the rods always at the forward ends of the slots. In other words a rearward movement of the rods in the slots is opposed by the action of the springs.

In operation the coal being too bulky to pass through the opening between a rod and the plate below it moves on over successive plates and out of the device. Slate, on the other hand, being thin and flat moves backward through the space between the rod and plate and falls out of the machine. Any piece too thick to pass readily through the opening provided is assisted by the rod movement the amplitude of which is comparatively small, amounting to only about  $\frac{3}{8}$  in. in the case of chestnut coal, that adapted to other sizes being proportional.

In actual use this machine has shown excellent results. A sample of the material picked from the coal by it was found to be of the following composition:

Total weight of sample.....	92 oz.
Slate in sample .....	74 oz.
Bone in sample .....	9 oz.
Flat coal in sample .....	9 oz.
Reduced to percentages these results are:	
Slate .....	80 $\frac{4}{9}$ per cent
Bone .....	9 $\frac{7}{9}$ per cent
Flat coal .....	9 $\frac{7}{9}$ per cent

These results speak for themselves and need no comment. It should be borne in mind, also, in considering them that they were obtained with an extremely simple device attached directly to a reciprocating sizing screen.



Traveling, Hoisting and Slewing Motions of This Crane Are Independent of Each Other

The stability of the shovel without any aid from track fastenings or outside jacks, without which the true railroad crane can

do but little, will attract attention. The advantage of the caterpillar lies not only in greater mobility but in stability also.



# COAL AGE

McGraw-Hill Company, Inc.  
James H. McGraw, *President*  
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Devoted to the Operating, Technical and Business  
Problems of the Coal-Mining Industry

R. Dawson Hall  
*Engineering Editor*

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Number 6

## Consumer Obligation

THE care-free consumer, as usual, is found to be the cause of high prices and coal shortages in the report of the coal-storage committee of the American Engineering Council. He lives through the summer like the grasshopper of the fable and laughs at the ants that prepare for the winter. The consumer by his numbers, his ubiquity and vociferousness has put the blame for shortage on the producer. The mine owner has been tried in the court of public opinion by a jury not one man of whom was unprejudiced.

The farmer must plow in the spring for the fall harvest, but the consumer must be served when, where and how he elects. Being so many, being spread in every state, the consumer's voice controls legislators and newspapers, so that what he wills he should have. Is it not written "The customer is always right" and that "The voice of the people is the voice of God"?

## Who Is Sinning Now?

THE SANCTITY of contract between employer and employee ought to be respected by both parties equally. For this reason it is not possible for this paper to support the course of action followed by certain operators in Oklahoma who, as members of their operators' association, were definitely committed to the Jacksonville agreement, but who, in order to evade the obligation of the contract, withdrew from their association and opened their mines on a non-union basis with wages at the 1917 level. This withdrawal is an evasion and ought not to have been attempted.

These operators must have known in May, when their association signed the agreement, that the market situation would be about what it is now. The time for them to have foreseen the impossibility of operating under the Jacksonville agreement and to have withdrawn from their association was before they became parties to the contract. The thing for them to do now is rejoin their association and add to it all the strength possible. Then the futility of the Jacksonville agreement should be proven to the union miners of that district by the association so convincingly that adjustments be made, President Lewis' never-give-in ultimatum to the contrary notwithstanding. Hungry men, beaten by the operation of the irrevocable laws of supply and demand, cannot be blind for long in Oklahoma any more than in western Kentucky where unionism is a losing cause.

Let contracts be sacred, come what may.

## Water as an Aid to Explosions

WATER helps to prevent explosions by keeping down the dust, and it may serve to extinguish explosions when not in the form of steam or vapor. It tends doubtless to cool the temperature of the blast when in the latter form, for water has a great capacity

for heat or as it may be expressed, a high specific heat.

But Mr. Ashworth in his discussion is correct in saying that steam aids combustion of methane by assisting in the chemical change which is known as combustion. Those who believe that saturated air will prevent explosions are entirely at fault. It tends, instead, to aid them. The value of supersaturated air is that it drops moisture and so dampens down the dust and tends to keep it from rising and also protects the workings from explosions in the same way as any other water.

Such supersaturation of the air must be of long duration or the water deposited will be of insufficient quantity. Saturated air is of value because it prevents the drying of the mine when it contains moisture. But it must be always saturated. It will not retard but rather aid explosions if saturated only at the time of the explosion.

As has been repeatedly stated, 30 per cent of water is necessary for immunity. The dust must be so wet that water can be squeezed out of it by pressure in the hand. It is difficult, almost impossible, to assure oneself that the dust is thus wet. Consequently rock dusting is preferable, so much so that to rely on water is suicidal. But water has its place also, as Mr. Walls says in the discussion department of this week. It is needed where mining machines are used, when coal is broken by explosives at the face and where cars are dumped underground, not only for the good it does at those places but also because it prevents the dust from being carried into other areas, especially into those sections of the mine where rock dusting is extremely difficult because not being laid with track the machines for rock dusting cannot reach them.

## Gas or Coal?

SO LONG HAVE we been rebuked by all and sundry about our wickedly irregular operation at coal mines that W. S. Blauvelt's article in this issue will be found exceptionally interesting. He assumes a 40 per cent capacity operation for the gas industry equivalent to 146 days in the year. Of course, the works run throughout the year but they have, except at steel plants, only that percentage operation as far as capacity is concerned. That is larger than the figure Mr. Orrock mentioned in his statement at the World's Power Conference. He put the figure at 30 to 35 per cent. It shows how grievously inefficient gas plants are and must be. No one is to blame. When inefficiency of this kind appears it is not considered to be objectionable and discreditable to the business in which it is discovered—unless it is the coal industry.

Mr. Blauvelt says that the interest maintenance depreciation and taxes cost of distribution are 22½ cents and the value of the gas 35 cents per thousand cubic feet. Adding to the distribution costs the costs of pumping and of gas losses the total is 27½ cents. That is 80 per cent of the value of the gas distributed. This



is a huge distribution cost, by no means discreditable to the gas industry, but one that the public would be prone to think heinous on the part of a coal company despite the long distances over which the coal might happen to be transported.

We begin to see why gas is made in the home in greater volume than at the gas works. However, we are disposed to believe and have been told that gas can be produced at far lower costs and is being so produced in Germany and we believe at one place in this country. We are informed that the pressures of distribution are too low and might be raised. It seems quite likely that even at higher pressures the losses might be made less. There are difficulties connected with both those suggestions. The same state and municipal authorities that are the Nemesis of the gas industry might interfere with either or both these means of cheapening gas. We wonder however whether an aggressive campaign of publicity might not aid the gas companies to get some relief from oppressive legislation and ordinances, provided, of course, the new methods of making gas, the new gas mixtures, and the higher pressures in distributing it are desirable.

But to revert to the cost of distribution. The pipes are like the salesgirl at the store. They wait on the consumer, ready to serve, but the consumer is slow to buy. The salesgirl could sell ten times as much as she does in the course of the day, but the public is not ready and willing to make purchases. Payment must be made for her loss of time, and similarly the public must pay for idle gas lines. If people will buy gas only when they want to cook a meal or heat an iron, the pipes must be idle for hours at a stretch. The public must pay for that.

We have only just commenced to study losses. Coal has received an attention from the economists that in time must be expanded to take in all industries. When that inquiry is made, we have no doubt that coal will be vindicated. The searchlight has been directed so persistently on coal that we are blinded to all else. The question is whether knowing the truth we can do more than deplore it. Each industry has known it for years. Every industrialist has tried to eradicate waste from his own operation. When those who do not understand the industry start out to reform it, will they get any further than hopes, vain hopes? We expect that reform will be internal rather than external. The public more often hinders than helps and almost never reforms.

Meantime let the coal yard flourish!

### Trip-Gathering Problems

THE PRACTICE described by Anthony Shacikoski in this week's "Problems in Underground Management" as the normal way of handling locomotive trips is, as he says, not conducive to large tonnage from the miner or maximum efficiency in locomotive operation. But is it indeed the normal way? In some mines the headings are kept well in advance of the working places. When that is done the locomotive can push the loads beyond the live rooms and bring the empties up behind it. As soon as these empties have been switched into the rooms the locomotive can bring out its train of loads, the time being occupied by the trip rider and motorman in the coupling of cars. Of course, the butt headings cannot be made indefinitely long, for the longer they get the more time is lost.

When they reach the property line, the outcrop or a length at which it is desirable to terminate them, the difficulties Mr. Shacikoski describes come into being. Then it is customary to put the empties ahead of the locomotive and with them forming a composite trip of loads and empties push the loads back. That duly done, all the empties as far as possible are stowed in working rooms, two or even more being run into rooms near the face so that they may be left near the end of the roadway and, in consequence, reasonably accessible to the inbye rooms.

This, however, though a common is not a safe practice, the pushing of a long trip of empties and loads in the presence of switches being quite liable to cause derailments. Furthermore, it frequently overtaxes the locomotive, especially if the grades are heavy and the power deficient, as is too often the case where the heading is long and both feed and rail return are none too effective owing to the distance that the current must travel. In some mines the working rooms are at all times near the end of the room entry and in that case, which is quite frequent, the empties almost always are pushed by the locomotive.

But perhaps Mr. Shacikoski is thinking of the practice in mines with thick coal where butt entries are usually short and cut off at frequent intervals by face headings, forming what are known as panels. There his method is not only convenient for the men and helpful to the locomotive but also safer as far as haulage is concerned than those described in the foregoing remarks.

However, it must be remembered that it presupposes the existence of an inbye face heading which may be actually only in contemplation. It often is not in existence but only laid off on the map. Development even in mines with thick coal is frequently thus far advanced, and sometimes it does not pay to advance it to such a degree.

Excessive development is often a cause in itself of low locomotive efficiency, for a locomotive in that case has to travel long distances between the ends of headings, gathering in the meantime only a small coal tonnage from the heading men. It is also a cause of low ventilation efficiency, for the current has to travel a long way merely for the heading men. A small current will serve if there is no gas, but if there is, a large current out of all proportion to the men engaged may be needed and the water gage must be high in consequence.

Granted, however, that there is such development the connections described will, in the absence of doors, make ventilation impossible, and doors are to be avoided especially where the coupling of trips is likely to compel them to be kept open for long periods. In some cases the grades might permit the actual coupling to be done beyond the door but the uncoupling of the empties even if done on a moving trip would make it necessary to move so slowly that the door would be open too long.

Oftentimes, even usually, the cars cannot be uncoupled while moving because, the grade being against the direction of travel, the couplings are stretched. Should the barrier pillar and chain pillar be thick the assembling might be done satisfactorily short of the door. Then the only trouble with the plan will be to regulate the air travel through the room entry so that the entries above will not be deprived of air. Where the mine is large that problem will be perplexing.



# English Washery Cleans Coal Before Sizing

Slack Today Must Be Clean to Be Salable—Compressed Air More Efficient in Action Than Plunger—Fines Carefully Drained and Mixed with Larger Sizes

By C. H. S. TUPHOLME  
London, England

IN RECENT years British coal-mine operators have realized that slack coal could be disposed of readily only if reasonably clean and free from dirt. This is true whether the fuel is placed on the regular market or used in coke ovens. Several methods have been tried for cleaning the raw slack as brought from the mines, but the system that has given the best results and has shown itself to be the cheapest to operate is that in which the slack is washed by immersion in specially constructed tanks containing water, which is subjected to pulsations of short duration sufficient to cause the slack to be thrown momentarily into suspension. Because of its lower specific gravity, the slack coal is held in suspension for a longer period than the intermingled dirt, and is thus carried forward in the current of washing water and finally separated from the impurities.

The usual method of carrying out this process is by means of a tank equipped with a division plate as shown in Fig. 1. The raw slack passes through the tank over a fixed sieve or perforated plate on one side of the central partition. On the opposite side of this plate generally is an arrangement of plungers or bashes, operated by eccentrics. These exert pressure on the water on the downward stroke, forcing it up through the screen and raw coal on the other side. The separation of dirt from the coal occurs during the upward stroke of the plunger.

A washer of a somewhat different type, that has proved highly successful in Great Britain, is the Baum. In this machine the plungers are replaced by compressed air controlled by piston valves. Air at a pressure of about 2 lb. gage is admitted to the washing tank through these valves, which retain the air under pressure on the downward and release it on the upward stroke. The bed of coal is forced upward when the valve ports are closed,

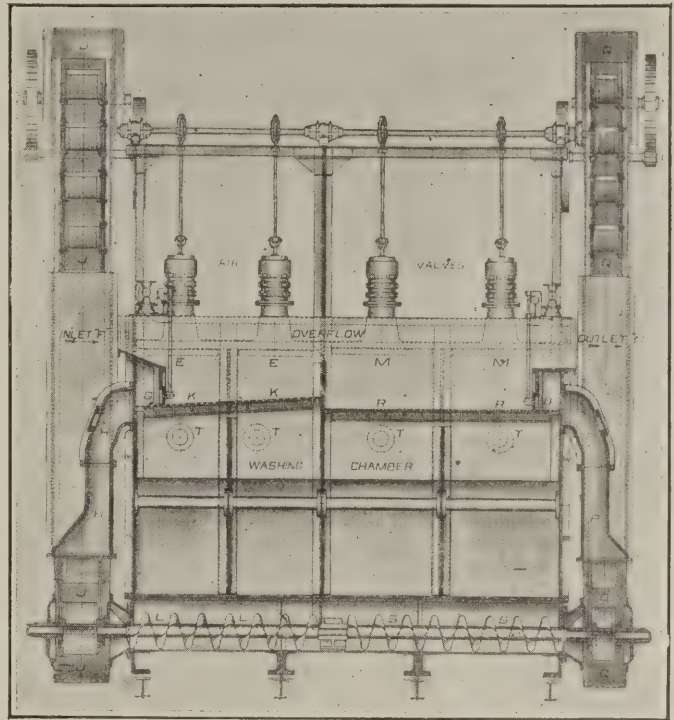


Fig. 2—Longitudinal Section of Baum Jig

In this machine the plunger of the ordinary jig is replaced by air under pressure. This is alternately admitted to, and released from, one side of the machine, causing water to surge upward through the screen and then settle back easily.

and separation of clean coal from the dirt occurs during the downward movement of the bed when the ports open and the air is released.

## COMPRESSED AIR ACTING DOWN FORCES WATER UP

A recent installation of this kind, shown in the accompanying illustrations is that at the Normanton Colliery of Pope & Pearson, Ltd.. It was built by Simon-Carves, Ltd., and is intended to treat 125 tons of coal per hour. In this plant the coal to be washed is brought in in railroad cars and discharged into an underground feed hopper from whence it is elevated into the building. The coal leaving the top of the elevator is flushed by water into the first washer box.

This washer box has a semicircular bottom, being divided longitudinally into two portions. One side is fitted with horizontal screens over which the coal is carried by the flow of water. The other side is provided with a set of air valves that allow puffs of compressed air to act on the surface of the water below. The pulsating movement thus set up brings the coal to the top of the bed, the dirt sinking to the screens, as explained before. Any small dirt falling through the sieves is taken to either end of the washer box by means of screw conveyors at its bottom.

Fig. 2 is a longitudinal and Fig. 3 a transverse section

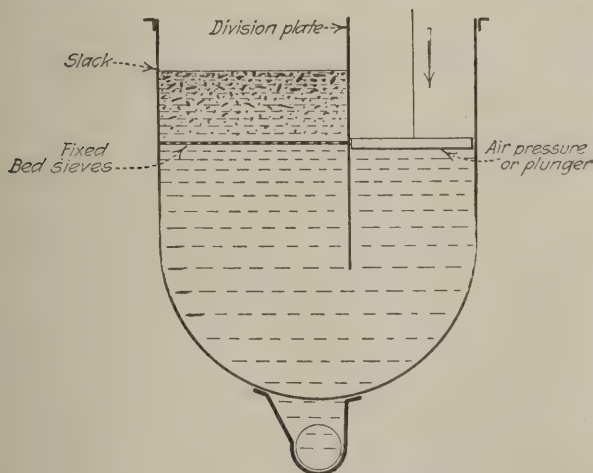


Fig. 1—Cross-Section of Simple Jig

This shows the division plate slightly off-center with the fixed screen on one side and the plunger or piston on the other. Reciprocation of the piston causes an upward and downward movement of the water through the screen and bed of material upon it. This causes the heavier particles to seek the screen and the lighter coal to rise to the top of the bed.



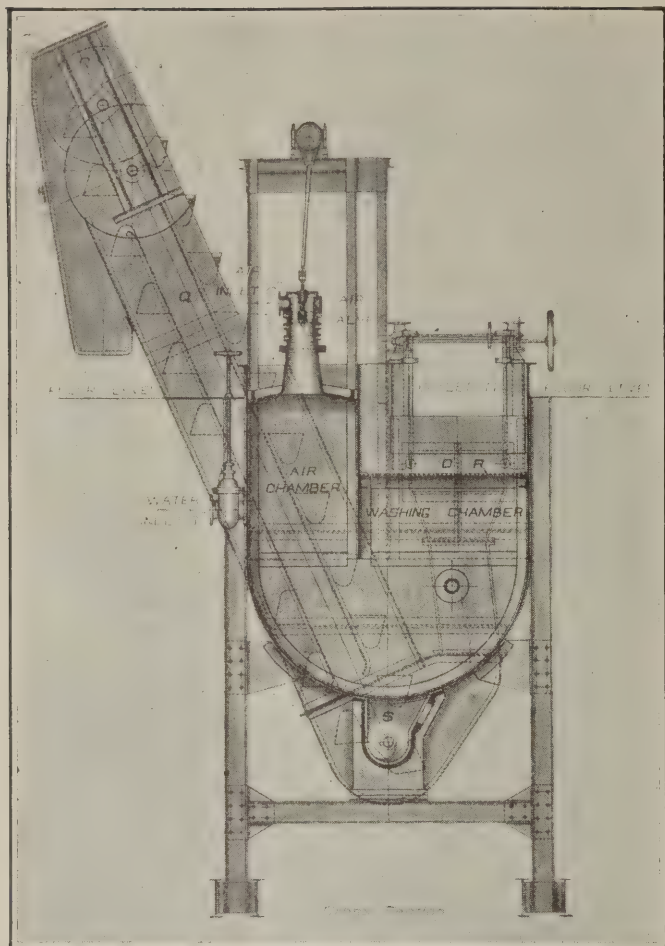


Fig. 3—Transverse Section of Baum Washer

The illustration shows clearly the air chamber and the air control valves operated from eccentrics on an overhead shaft. Inasmuch as air is perfectly elastic and as both upward and downward surges of the water through the screen are cushioned thereby, this washer is "easy" on the coal that it treats, and degradation within the machine is small.

of a four-valve Baum washer box. A single box of this type is capable of handling raw slack passing through a 3½-in. mesh at a capacity of about 75 tons per hour. For capacities up to 150 tons per hour an additional box is provided in which the fine coal is rewashed.

The operation of this machine is as follows: Compressed air enters the valves at *C* and passes directly through to the air chamber when the piston covers the valve ports. When the piston is at the opposite end of the stroke the ports are open, thus allowing the air to escape to the atmosphere. The continuous operation of the valve gives the required movement to the water in the washing chamber. The raw coal enters at *F* and is deposited on the screen *K* in the first section of the box *E*. The heavy dirt collecting on the screen is taken away continuously through the adjustable sluice gate *G*, passing down the chute *H* into the dirt elevator *J* by which it is elevated and drained before being discharged.

Coal, with any middlings product or light dirt, overflows into the second part of the washer box *M*. The dirt collects on the screen *R* and is passed continuously at a suitable rate through the adjustable sluice gate *O*, down the passage *P* and into the buckets of the dirt elevator *Q*, where it is treated exactly like that in the elevator *J*. The finest dirt collecting on the screens *K* and *R* passes through the perforations and settles to the bottom of the washer box. Thence it is conveyed by the worms *L* and *S* to the elevators *J* and *Q*.

Washed coal from the second compartment *M* over-

flows from the outlet *N* and passes to the classifying screens or to bins as required.

Experience has shown that the advantages of using compressed air to produce the pulsations in a washer, as compared with the ordinary direct-acting piston or bash, lies in the fact that the air acts as a cushion during the return stroke, and so eliminates all suction. The object of the transverse division of the washer by plates is to insure the proper pulsation of the water. Gates or sluices are fixed at either end of the screens and at the front end the raw coal passes over the gate into the box while the heavy dirt passes immediately under the gate into the dirt elevator. At the other end the washed coal passes over the gate while the remainder of the dirt is drawn out into the second elevator. These gates can be regulated to a nicety, thus obtaining an efficient separation. Once the machine has been adjusted for a particular kind of coal consistent results are obtained.

The washed coal flows with the water from the washer box into a set of large, revolving, classifying screens provided with mantles to size the coal into what in British parlance are known as nuts, beans, peas and fines. The three larger sizes pass over drain sieves where they are sprayed, and thence down spiral chutes into storage bins.

Should the raw slack contain a large percentage of interstratified rock, this material can be extracted as a separate product and collected in the dirt elevator *Q*. Thence it can, if necessary, be passed through a crusher, and back to the washer box for retreatment.

Wash water enters the box through the valves *T*, the supply of both water and air in each part of the box being regulated separately by the different valves shown.

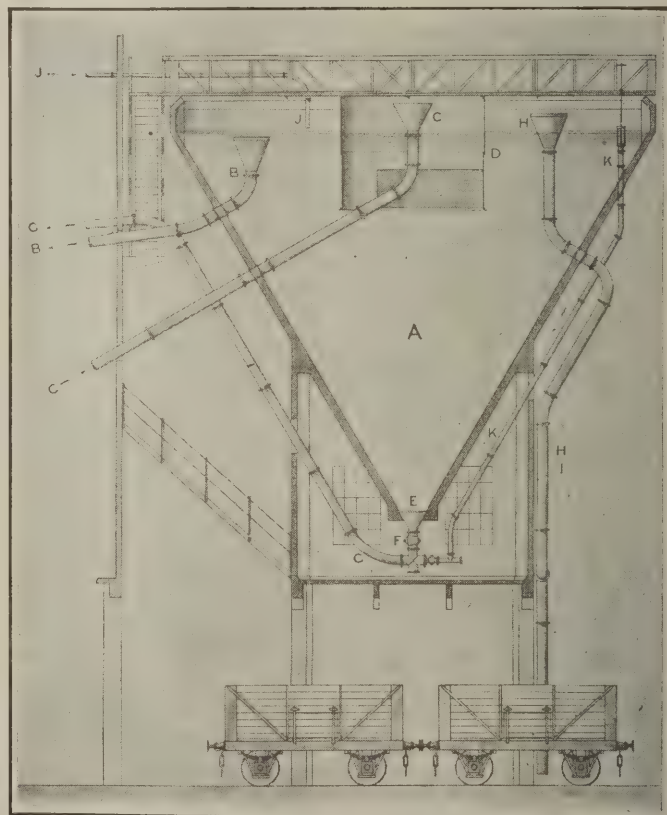


Fig. 4—Section of Water-Clarification Tank

The arrangement of this tank and the various pipes leading to and from it is such that, although its action is continuous, clear water is taken off at the top and sludge at the bottom. This latter is dewatered, mixed with the larger material and sold.



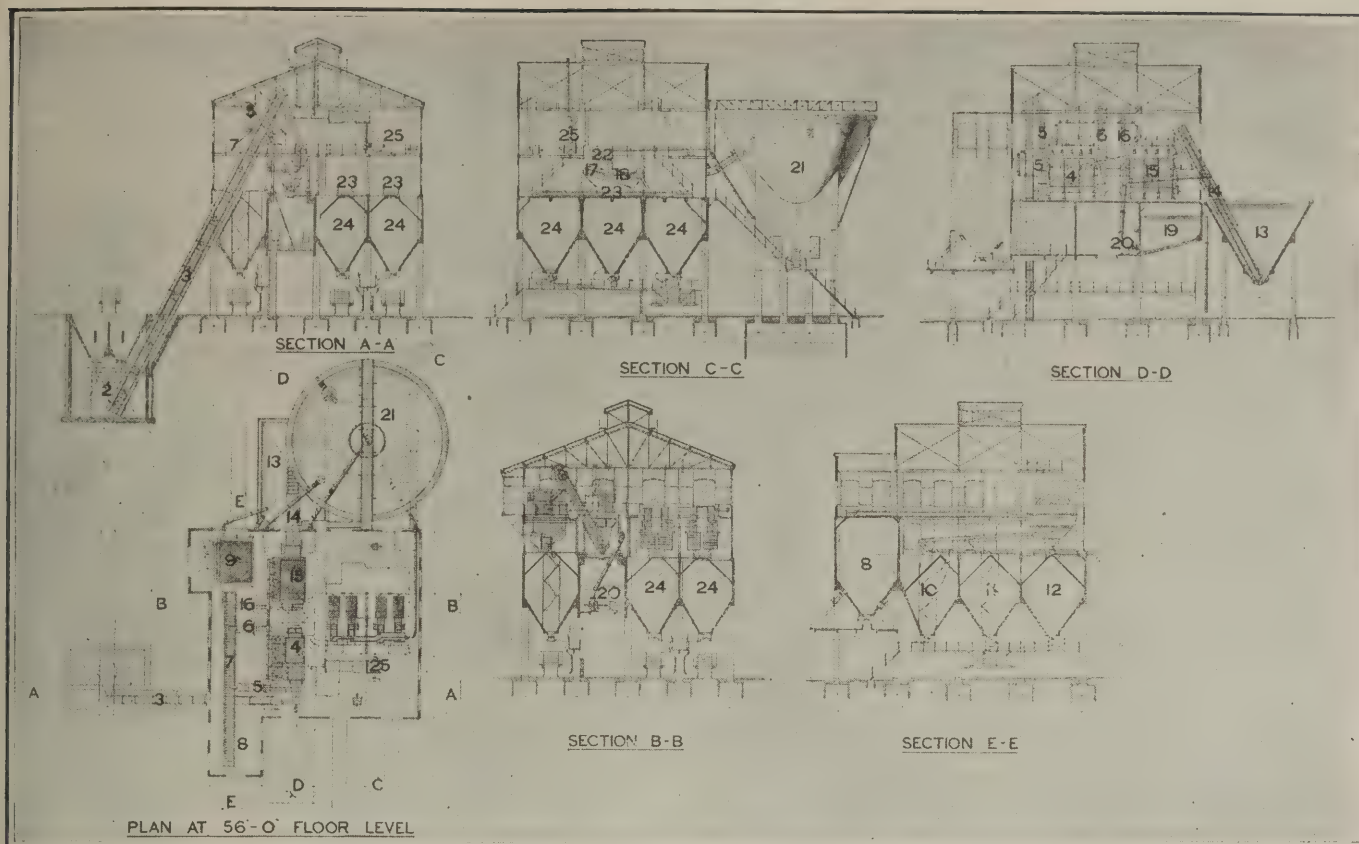


Fig. 5—Various Sections of a Large Capacity Washery

This installation is intended to prepare coal of  $3\frac{1}{2}$  in. and smaller at the rate of 150 tons per hour. After washing and screening the larger sizes are carefully lowered down spiral chutes into the storage bins. The finer sizes, naturally, are not treated so gently.

Water leaving the box at the outlet end together with the washed coal can be drained off and collected in the settling tank.

In this process it is found that an even pressure is obtained along the whole length of the washer. As on the return stroke the air acts as a cushion, the downward movement of the bed is retarded, and the maximum time is allowed the various materials for separation according to their respective specific gravities.

Wear and tear on the various parts of the machine is small, the valve pistons operating at a speed of only 40 to 50 strokes per minute. The absence of direct-acting plungers does away with the liability to breakdown as no function of the air pistons is sufficiently strenuous to make this contingency possible. As a matter of fact, wear on the pistons is negligible so long as they are kept well lubricated. Power required for operating the valves is therefore practically nil.

It is possible to wash slack smaller than  $3\frac{1}{2}$  in. without initial classification into various sizes, thus eliminating dry screens. These are in many cases costly in maintenance and supervision, and also, are not always efficient.

It will be understood that the principle of classifying after washing prevents degradation of the various sizes produced. This is an inherent attribute of the Baum washer; another advantage is the avoidance of dust production.

The fines together with the water pass from the revolving screens into a "smudge" sump. Here the surplus water overflows into a collecting sump and the fines are removed by an elevator to a rewashing box. This machine is of similar construction to the first but is provided with a wider bed and the pulsations are much

more gentle so as to separate fine dirt and coal. The washed fines after leaving this box flow with the water to the fine coal and slurry dewatering plant, which is simple in action and takes up little space.

In this type of washer a feldspar bed is not required. All the bed necessary is provided continuously by the dirt extracted from the raw slack.

The coal becomes cleaner as it passes along the first section of the box, the capacity thus being greatly increased. In other words, more can be accomplished in a small area than a large area where the coal and dirt are separated only at the outlet end of the washer.

The lighter products from the first section are again treated in the second section where the last traces of dirt are extracted. The complete separation of extraneous material is thus performed in one continuous operation. Large dirt particles are collected along with the finer material from each section in one elevator. The larger dirt thus acts as a filter for the smaller stuff. In this manner all the dirt is handled mechanically and is drained to a condition where it may be disposed of without further handling. The washing boxes themselves are constructed deep enough to allow the small dirt to settle without the possibility of its being carried away with the current of water and getting mixed with the coal.

#### EFFICIENT SEPARATION OF SLURRY

Temporary stoppages of this machine do not alter the quality of its products, as an air relief valve can be opened immediately stopping the action of the washer. Thus, there is no possibility of the whole bed being washed out of the box through the dirt gates, as is sometimes the case when plunger jigs are used.



The elevated conical tank (see Fig. 4) is the main water reservoir for the washery. It is here that the settlement of the slurry and the clarification of the dirty water takes place. This tank is located at such an elevation that the clean water can flow by gravity through the pipe *B* to the washer boxes. After doing its work in the washers, and finally being collected in a sump, it is pumped back to the tank through the return pipe *C*. The outlet of this pipe is surrounded by a steel curtain *D*, perforated at its lower edge. This guides the suspended material downward without disturbing or contaminating the clean upper layers of water from which the washing water is drawn. The velocity of the incoming water quietly decreases, thus allowing the fine solids to settle gradually to the bottom of the tank.

An outlet *E* is arranged at the bottom of the tank, provided with a cock *F*, so that all fine material or slurry can conveniently be allowed to pass by gravity through the pipe *G* back to the washery to be mixed with the fine coal. An overflow pipe *H* is provided to insure a constant head while the fresh water to replace that lost in the washed coal enters through the pipe *J*. An auxiliary water pipe *K* connects with the pipe *G* to regulate the consistency of the slurry. One circulating pipe serves the entire installation.

Where it is necessary to classify the washed coal for "sales" the latest plant is arranged for delivery of the nuts and beans by gravity from the screens direct to the bins, thus avoiding the introduction of water for conveying the larger material after it has been classified. The fine coal is delivered from the washer box or classifying screens, as the case may be, to shaker screens. The slurry recovered from the settling tank is also delivered to these screens along with the fine coal. In addition to being drained this material is intimately mixed with the fine coal, so that the smudge or fines has a good appearance when offered for sale.

In many cases the moisture is reduced sufficiently to enable the coal to be passed directly into a small bin of, say, 40 tons capacity, and from there to railroad cars. Where it is necessary to reduce the moisture still fur-

ther for coking purposes the fine coal and slurry from the shaker screens can be delivered into drainage and storage bins. If a large storage is not required the mixture of fine coal and slurry can be delivered to a draining conveyor. The drainage water from the shaker screens is collected and sent back to the conical settling tank.

The washery at Normanton contains inclined drainage sieves taking the surplus water out of the fines, as well as shaking screens that agitate the fine coal and slurry together while draining them. The fines after travelling down the inclined sieves, which are fitted with brass wires of wedge-shaped section with fine slits between them, fall onto the shakers which are fitted with similar screens. As the fine coal is moved along these screens by the vibration, the slurry which has settled from the washery water flows by gravity to an upper set of inclined sieves. From these it falls on top of the fines which act as a filter bed and allow the slurry to be dewatered without getting back to the circulation water.

The fine coal and slurry leave the vibrating screens in a well-drained condition and are distributed by scraper conveyors to a set of three bins. These are equipped with perforated grids at their bottoms and their outlets are provided with special drip trays. The fine coal and slurry being uniformly mixed continue to drain in these bins until drawn off to cars.

The water-collecting sump is emptied by a centrifugal pump that discharges to the conical settling tank. The slurry settles to the bottom, passes through a mouth-piece and is transferred by a pipe to the drainage screens, the head of water in the tank forcing the slurry up to these sieves continuously. Thus there is no pumping or mechanical handling of the slurry, and in consequence the water in the tank is not disturbed, the settlement of the slimes being uniformly maintained.

The entire plant is operated electrically. Great care has been taken to provide easy access to all moving parts for inspection and lubrication.

The lower portion of the building at Normanton,

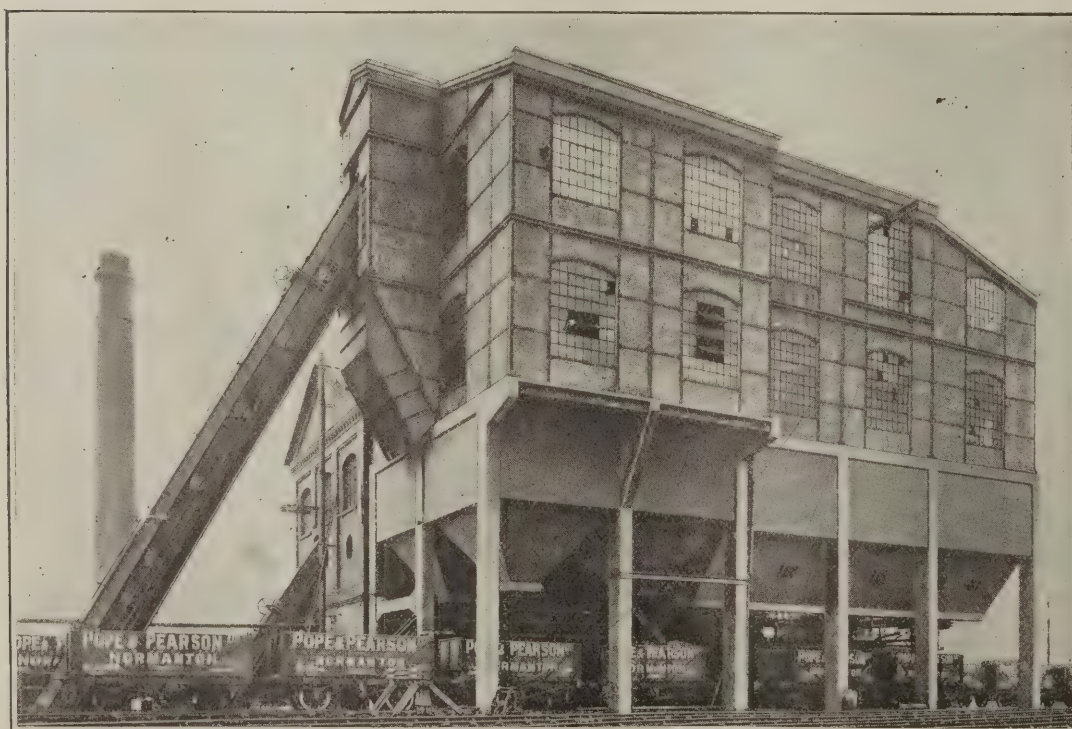


FIG. 6  
Normanton  
Washery

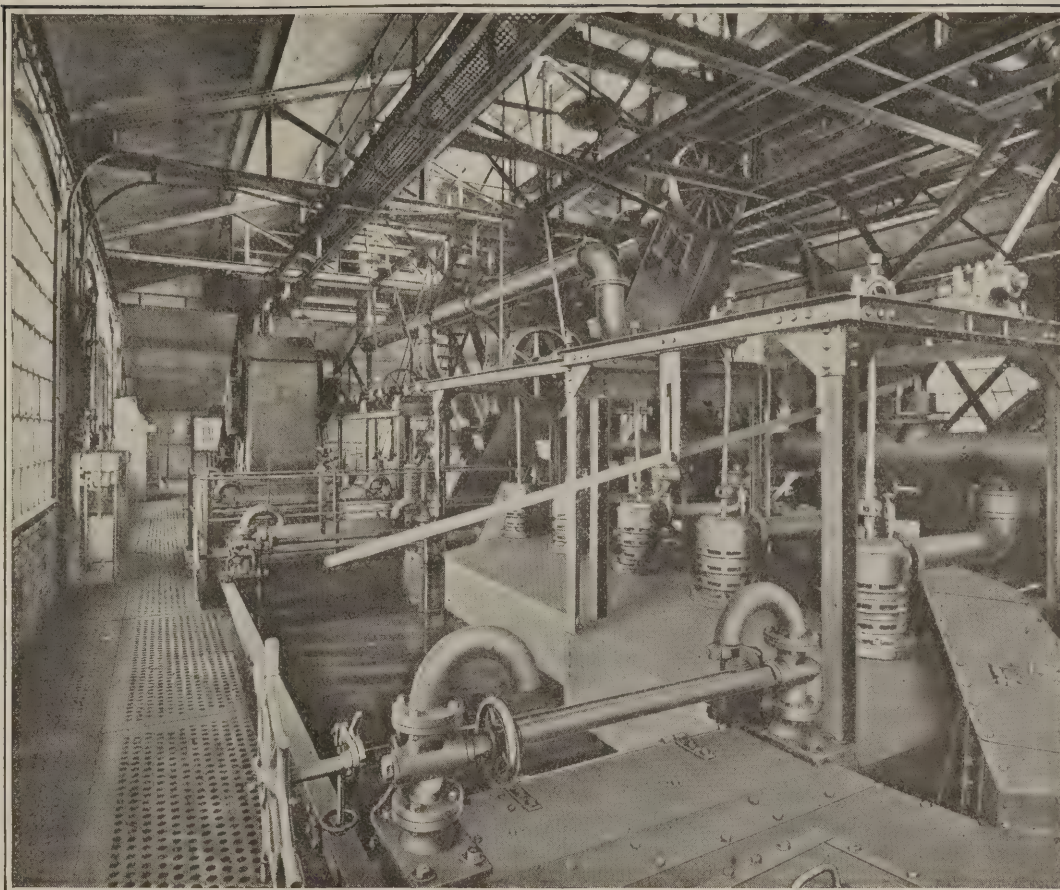
In England, as in this country, coal preparation has become a science. That coal washing pays may be judged from the type of washery shown in this illustration. All parts of the building coming in direct contact with water or wet coal are of concrete, the rest of the structure being a steel framework filled in with brick paneling. Though such buildings are higher in first cost than the wooden structures of similar nature frequently built in this country, as they depreciate slowly the greater cost is justified.



FIG. 7

**Washery Interior**

This reveals with unmistakable clearness the extreme neatness of the interior of the Normanton washery. Few washeries in the United States can compare with it in this respect. One air-actuated washing unit can be seen in the foreground with its air valves and eccentrics. Another unit appears in the rear of the illustration. The air main can be seen at the back of the nearer washing unit. The lower parts of the washing chamber are hidden by water. This view, though not as broad in scope as section D-D in Fig. 5, is seen from about the same point. The various parts can be recognized by a glance at the horizontal section in the same figure.



including the storage bin, is constructed of reinforced concrete, and the settling tank and feed hopper are of this material throughout. The upper part of the main building has a steel framework which is filled in with brick panelling. The entire structure is covered by a reinforced-concrete roof. It is interesting to note, in passing, that the buildings comprising this plant are located upon made ground, particular care being necessary with the foundations. Both the washery building and the settling tank are supported on reinforced-concrete rafts extending under their whole area.

An earlier installation of the Baum washer intended to treat 150 tons per hour, is shown diagrammatically in Fig. 5. This is located at the Penallta Colliery of the Powell Duffryn Steam Coal Co., Ltd. The raw coal is delivered to the underground hopper (1) from the bottom of which it is withdrawn at a uniform rate by the chutes and revolving feed tables, (2). The coal is thus delivered to the boot of the elevator, (3). This elevator carries the whole of the raw product direct to the washer boxes, (4). The heavier dirt is drained in the elevator (5), and the lighter dirt in the elevator (6), both of which deliver to the scraper conveyor (7), which carries this material to the bin (8).

The washed coal is then separated into four sizes in the revolving screens (9). The nuts and beans are passed over drain sieves into their respective bins (10) and (11), which are fitted with spiral chutes. The peas pass direct into the bin (12). The fine coal collects with the wash water in the smudge sump (13) from whence it is removed by the smudge elevator (14) to the rewasher box (15). The dirt from this jig is lifted by the elevator (16) to the scraping conveyor (7).

The washed fine coal flows to the drain sieves (17), and from there to the shaker screens (18). The water

and slurry drained from the coal pass into the smudge sump (13), from whence the water overflows to the pump sump (19). The centrifugal pump (20) lifts the water from this sump to the settling tank (21). The slurry from the settling tank returns by gravity to the washery, and after passing over the dewatering screens (22), is thoroughly drained and mixed with the fine coal on the shaker screens (18). The combined products pass to the scraper conveyor (23) which distributes the washed coal to the fine-coal bins (24). The washed coal is taken away in railroad cars, the larger sizes being loaded by means of special chutes. Dirt is removed from its bin in mine cars. Compressed air for the washer boxes is produced by the blower (25). The entire plant is operated by three electric motors.

### North Carolina Mines Started in 1830

Across the State of North Carolina and parallel to its east and western boundaries runs what appears on the map as a narrow scar. It is the Triassic formation. In the center of this strip was an old plantation owned by Peter Evans and located in the great northward bend of the Deep River, including the village now known as Cumnock and the area known as Egypt. Mining started in 1830. In 1852 the Egypt shaft was sunk which reached the Cumnock coal bed at 430 ft. After the Civil War the name of the company was changed to "The Egypt Co." During that struggle it shipped coal part by railroad and part by barge to Wilmington, the coal being used extensively by blockade runners. The mine was closed in 1870 and remained flooded till 1888. In 1902 it closed down, having a bad reputation for gas explosions. Since 1922 the mine has been actively developed by the Erskine Ramsay Coal Co.



# Why Gas Rarely Replaces Coal for House Heating

Municipal Standards Prevent Service at Minimum Cost — Small Consumer Does Not Pay Reasonable Price for Investment He Makes Necessary — Gas Company Has to Lay Distributing Pipes, Whereas Coal Goes Over Public Highway

BY WARREN S. BLAUVELT

President, Vigo Mining Co.,  
Terre Haute, Ind.

**M**ANUFACTURED gas, in competition with anthracite and bituminous coal, for heating houses, is generally handicapped in two ways, and without exception is heavily handicapped in a third way.

One of these handicaps is the prevalence of city or state gas-quality standards which do not permit the distribution in each locality of the particular kind of gas which could be manufactured and distributed so as to give the maximum service at a minimum expense.

Another handicap is the general prevalence of inequitable gas rates. Commonly the consumer whose maximum hourly consumption is excessive compared with his average monthly bill, pays less than the cost of his service, whereas the consumer whose maximum hourly consumption is relatively small compared with his average monthly bills, pays far more than the cost of his service. The third and most serious handicap on gas consumption for house heating will be developed in the following discussion.

Gas with a heating power of 400 B.t.u. per cubic foot can be manufactured on a large scale, from coal costing \$5 per ton delivered at the works, and sold profitably, *at the works*, for an average price of 35c. per thousand cubic feet, if the average rate of operation for the entire year approximates 40 per cent of the rated plant capacity. As the heating efficiency of gas appliances greatly exceeds that of coal-burning apparatus, and as gas consumption is automatically controlled to meet instantly varying requirements, in actual house-heating practice, 35M cu.ft. of 400 B.t.u. gas are the equivalent of 1 ton of anthracite or of high-grade bituminous coal.

Assuming that the costs per ton delivered on cars to a retail yard are \$10 for anthracite and \$5 for high-grade bituminous coal, and that yard expense, overhead charges and net profit combined, average 25 per cent of these costs, purchasers would pay, *at the dealer's yard*, \$6.25 per ton for bituminous coal and \$12.50 per ton for anthracite.

With the above prices at the seller's premises, the householder requiring 12 tons of anthracite or bituminous coal, or its gas equivalent, to heat his home satisfactorily through the heating season, would pay each year for fuel at the seller's premises as in Table I.

TABLE I—Cost of Fuel at Gas- or Coal-Yard

Anthracite.....	\$150
Bituminous.....	75
Gas.....	147

This we will term Item I. The expenses on the consumer's premises, other than for fuel, vary greatly with the kind of fuel used, and many of these expenses with coal are often overlooked. When solid fuel is burned, storage room for coal, ashes, and kindling must be provided; the additional cost of this space in a house where 12 tons of coal are stored and burned each year will be not any less than \$400, assuming a concrete floor and concrete or brick walls and may be much more. The yearly charges in such an investment—not required where gas is used—are as in Table II.

In the cost of delivery of fuel to his residence from the seller's premises, the gas consumer fails to get the same square deal from the public that the coal consumer enjoys. For the delivery of solid fuels, the public provides a free highway, generally paved, paid for and maintained by taxes, a share of which are

paid by the gas merchant and collected from the gas consumer in every gas bill.

The coal consumer is required to pay the coal merchant only the actual costs involved in such delivery.

TABLE II—Interest on Cost of Cellar Space and Other Costs Accompanying Use of Fuel

	Anthracite	Bituminous	Gas
Interest on cost of cellar space at 6 per cent.....	\$24.00	\$24.00	0.00
Depreciation at 3 per cent.....	12.00	12.00	0.00
Taxes at 2½ per cent.....	10.00	10.00	0.00
Interest on cost of delivered coal at 3 per cent (6 months).....	5.13	2.88	0.00
Total capital charges per year on investment not needed with gas.....	\$51.13	\$48.88	0.00
Removal of ashes not needed with gas.....	4.00	4.00	0.00
Damage to property caused by smoke and soot....	0.00	40.00	0.00
Item II, total of above items.....	\$55.13	\$92.88	0.00

As these costs seldom exceed \$1.75 per ton from yard to consumer's cellar, this sum will be assumed as the delivery cost per ton for anthracite or bituminous coal. The corresponding average cost of the actual delivery of gas from seller's to consumer's premises may be safely estimated about as in Table III.

These delivery costs of each kind of fuel for the season are set forth in Table IV.

This we will term Item III. Tabulating the foregoing items we obtain the comparative costs of heating the home for the year contained in Table V.

Obviously, under such cost conditions, householders, whether they employed a janitor or not, would quickly turn from both anthracite and bituminous coal to the



cheaper, safer, cleaner and vastly more convenient gas. But, unfortunately for the gas consumer, these conditions do not exist. Instead of providing for the gas consumer a free highway for the delivery of his fuel, as we do for the coal consumer, a highway for gas is provided by private investors and this highway is heavily taxed by city, county and state.

In consequence the gas consumer is required to pay

TABLE III—Cost of Delivering Gas to Consumer

	Per M Cu.Ft.	Per ton of Coal Equivalent
Power for pumping gas.....	0.01	0.35
Unaccounted for (leakage, etc.).....	0.03	1.05
Meter expense.....	0.01	0.35
Totals.....	0.05	1.75

tolls for the passage of his fuel through the gas turnpike. These tolls, of necessity with such a system, must pay all charges for interest, depreciation, taxes and maintenance. As the actual investment in a city gas distribution system may be safely estimated at \$1.50 per thousand cubic feet of gas delivered and sold per year, the gas highway tolls will be as in Table VI.

Adding this expense for gas to the comparative costs previously stated, we obtain the comparative total costs given in Table VII.

From this analysis of the various items making up the total comparative costs of house heating with anthracite, bituminous coal and gas, it is quite obvious that unless the handicap of highway tolls borne by the

TABLE IV—Delivery Costs of Twelve Tons of Fuel

Anthracite.....	\$21
Bituminous.....	21
Gas equivalent.....	21

gas consumer is eliminated or greatly reduced, house heating with manufactured gas will continue as at present, a convenience for those only who can and will pay for such a luxury.

This gas highway toll charge which is the greatest economic barrier against the general substitute of gas for coal in house heating, is unfair in the competition between gas and coal; it is unjust as between land owners and gas consumers; it is unnecessary and its elimination would tend to the rapid abatement of the smoke nuisance, which in many cities causes damages totalling from ten to twenty dollars per capita each year.

For the public to provide a free highway for the delivery of coal, coke and oil from the merchant's to

TABLE V—Actual Fuel Costs as Heretofore Considered

	With Anthracite	With Bituminous	With Gas
Item 1, cost of fuel at seller's premises.....	\$150.00	\$75.00	\$147.00
Item 2, comparative costs on consumer's premises.....	55.13	92.88	0.00
Item 3, Actual delivery cost—12 tons coal or gas equivalent.....	21.00	21.00	21.00
Item 4, total of above items.....	226.13	188.88	168.00
Item 5, labor, if janitor is employed.....	60.00	60.00	0.00
Item 6, total.....	\$286.13	\$248.88	\$168.00

the consumer's premises while compelling the gas consumer to pay highway tolls for the delivery of his gas, is clearly to maintain an unfair competitive condition.

Equity requires that the land owner should pay for the financial benefit which he can, or does, receive from

the presence of a gas distribution system through which gas may be delivered to the occupant or purchaser of his land; if he rents his property he collects higher rent where gas service is available than where such service is lacking; if he sells a lot where gas service is available, he gets a price higher than the sum of the price of a similar lot where gas service could not be obtained, and that part of the entire cost of the gas distribution system of the city which could equitably be charged against the lot in question.

As the gas company and not the land owner has paid for the gas highway, the gas consumer pays gas highway tolls twice; he pays them in higher rent to his landlord, or their capitalized value in a higher price if he buys the lot; then as the gas company has not received the money, he pays again in tolls on the gas he consumes. That the land owner should get something

TABLE VI—Highway Toll Gas Must Meet

	Per M. Cu.Ft.	Per Ton Of Coal Equivalent
Interest on \$1.50 at 7 per cent.....	\$0.1050	\$3.675
Depreciation on \$1.50 at 3 per cent.....	0.0450	1.575
Taxes on \$1.50 at 2½ per cent.....	0.0375	1.3125
Maintenance at 2½ per cent.....	0.0375	1.3125
Total highway tolls.....	0.2250	7.8750
Item 5, Gas highway tolls on gas equivalent of 12 tons of coal.....		\$94.50

for nothing while the land occupier and gas consumer has to pay twice for the use of the gas highway is an injustice which becomes obvious upon consideration of the facts. If and when this injustice and its effects are clearly understood by gas consumers, gas distribution systems generally will be purchased from their present owners and the cost assessed against the land values benefited by their presence. Thus the tolls on the gas highways may be abolished, and manufactured gas will be enabled to assume its rightful place as the cheapest, cleanest, safest and most convenient fuel for house heating.

TABLE VII—Complete Costs When Using Any One of Three Fuels

	Anthracite	Bituminous	Gas
Item 4, Previous total—no labor charge.....	\$226.13	\$188.88	\$168.00
Item 5, Highway tolls for gas.....			94.50
Item 6, total comparative costs without labor charge.....	\$226.13	\$188.88	\$262.50
Item 3, labor firing.....	60.00	60.00	
Item 7, total comparative costs including labor.....	\$286.13	\$248.88	\$262.50

Incidentally also the elimination of the monopolistic feature of ownership and control of the gas highway, from the business of gas companies, would make unnecessary much of the political interference with the service functions of manufacturing and selling gas, and probably the danger of municipal ownership and consequent political mismanagement of the gas industry would disappear.

COALDEX is a pamphlet published by H. E. Friend, of 177 Church Street, New Haven, Conn. The subtitle of this little book is "A practical method for determining the value of bituminous steam coal." It gives charts for determining the relative value of competing coals from their specifications. It endeavors to answer the question: Which coal shall I buy? Paper cover, 20 pp., 9½x12½ in., \$3.



# Fitting Latest Switchboard Appliances to Mine Generators and Converters

Only Such Equipment as Gives Protection Against the Most Frequent Delays Is Needed — Simple Apparatus Requiring Few Adjustments Preferable — Thermal Relay Permits More Efficient Use of Generating Machinery

By W. L. NEWMAYER\*  
East Pittsburgh, Pa.

**C**HIEF AMONG the requisites of automatic switching equipment for mine service are reliability and simplicity. Reliability of operation, particularly in the mining field, can be obtained only by the use of rugged and substantial apparatus which will function properly under mine conditions which unfortunately are always adverse to satisfactory service. The equipment must be positive in operation, as nearly trouble proof as possible, and should not be affected by external conditions such as heat and cold. Finally, the apparatus must be adequately protected against abnormal conditions by suitable protective devices. It is fairly simple to supply equipment which will automatically start a motor-generator set or synchronous converter under normal conditions, but it is not so simple to provide such equipment, with the addition of protective features, which will protect positively against any trouble which may occur.

However, continuity of service can be obtained without highly complicated or intricate apparatus. Once reliable operation and adequate protection are assured it is a mistake to add special features, particularly to mine equipment where simplicity is desirable. Additional protective apparatus means more possible places of failure, more expert maintenance supervision and

complications not warranted in most mine operations.

As a rule, the single-unit substation, which has only one motor-generator set or converter, is the most desirable. By placing single units at various points inside or outside of the mine the voltage at all points can be kept well up to normal without investing heavily in copper for feeders. The equipment is also simpler than that of a two-unit station, as special apparatus for paralleling two machines in the same station need not be provided.

The service requirements of an automatic substation are not always the same. One operator may want a highly flexible and complicated control, requiring perhaps one machine to operate all the time and a second to start up, on load demand, with provision for interchanging machines, etc.; while another may go to the other extreme and require the elimination of protective features which never should be omitted in an unattended station. Undoubtedly there are applications where double-unit stations with low-voltage and load-demand starting, etc., should be supplied. However, it will be found that in the majority of cases the single-unit stations with the following features of control and protection will be the most satisfactory:

(1) Remote control by means of a push-button station which may be located as far as several miles away from the substation and connected to it by two control

\*Switchboard Engineer, Westinghouse Electric & Manufacturing Co.

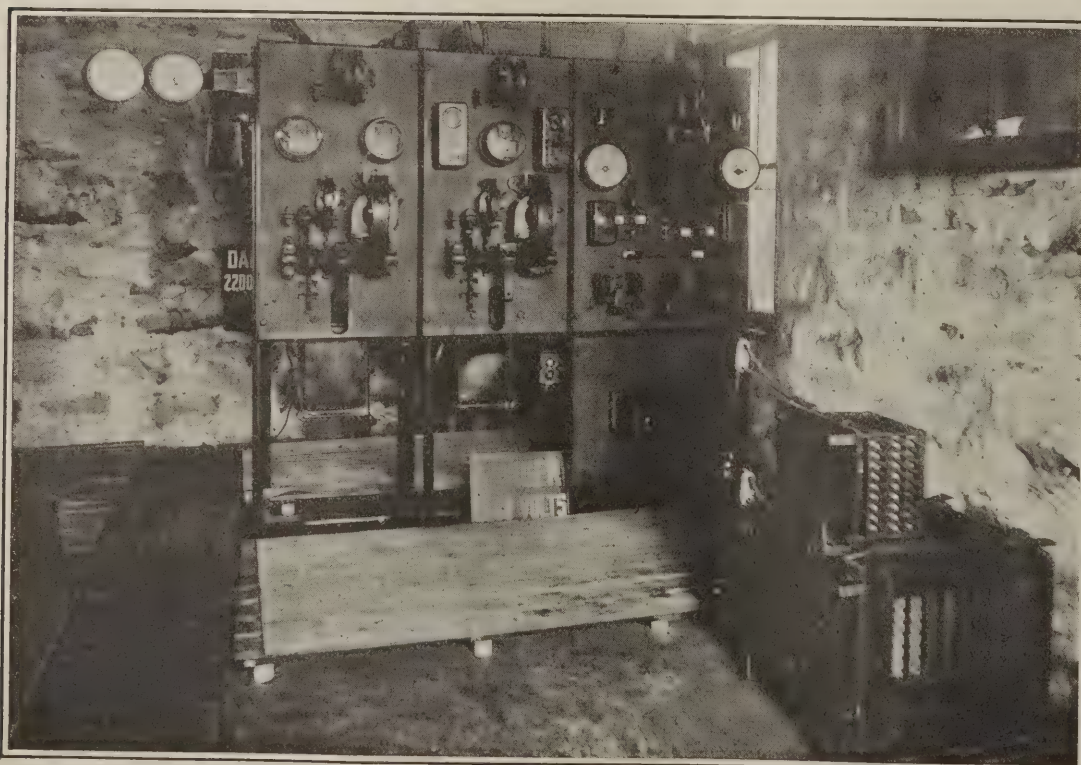


FIG. 1

## Automatic Panels

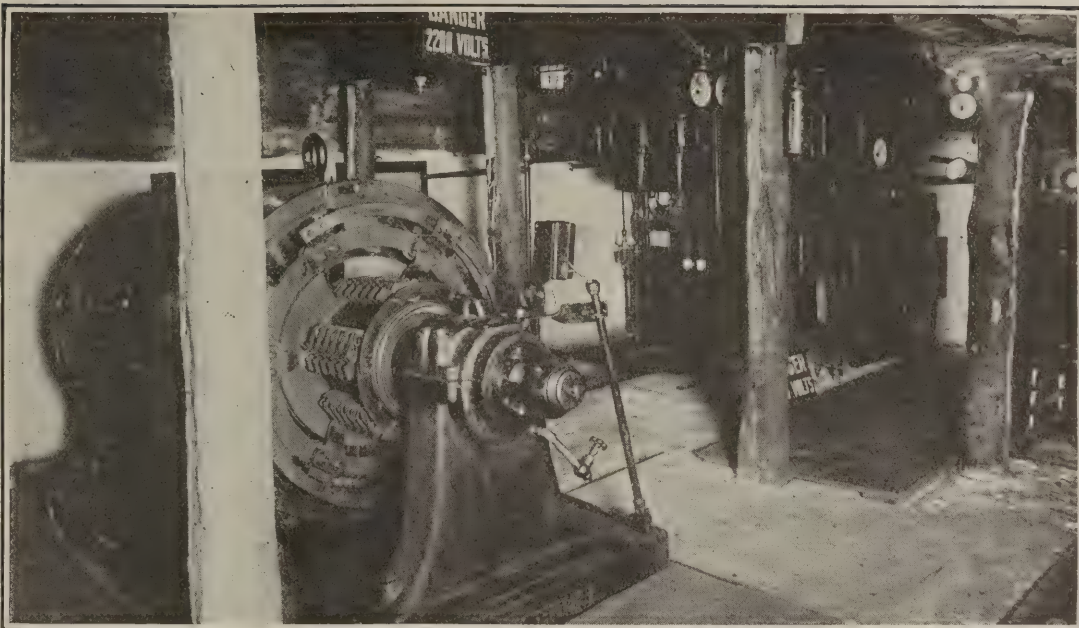
This outfit controls a 150-kw., 2,200-volt, three-phase, 60-cycle, 275-volt direct-current motor-generator set. The alternating-current oil circuit breakers are mounted directly behind the left-hand and center panels. All that can be seen of these breakers are the clapper control mechanisms for starting and running them. The direct-current circuit breaker automatically opens and recloses. The thermal relays are in the upper part of the middle panel.



FIG. 2

**Underground Station**

Automatic equipment for use at mines must be reliable and simple. Power delays are always of serious consequence to the mine operator, therefore he must be well equipped with apparatus which will rarely fail. Mine conditions are such that complicated devices cannot always be given necessary care and supervision, hence, protection against troubles which rarely occur should not be indiscriminately provided.



wires of sufficient capacity to carry only the small current required to actuate the starting relay.

(2) Full automatic control by means of a time switch which will start the station at a predetermined time each day and will shut it down at another predetermined time. The time switch may be equipped with the Sunday cutout attachment which will prevent operation of the substation one day a week. Such a clock need be wound only once a week. The station runs continuously, regardless of load during the period the control circuit is energized.

The source of control for operating the various relays is obtained from a small operating transformer energized from the incoming alternating-current line. The direct-current circuit breaker is of the service-restoring or automatic reclosing type which opens on overload and recloses when the circuit resistance to the load rises to a limiting value.

A station is "locked out" when its equipment is not only shut down but prevented from restarting until an inspection is made and the trouble cleared. Motor-generator sets are usually provided with the following protective features which "lockout" the station in case of trouble: (1) Heavy alternating-current overload not quickly relieved by the opening of the direct-current circuit breaker, (2) failure of the set to start properly or continued operation of the starting auto-transformer or compensator, (3) overheating of machine bearings and (4) reversed polarity of the generator especially if it is feeding into a system also fed from some other source.

The motor-generator set is only temporarily disconnected in case of the following: (1) Alternating-current supply failure or low voltage, (2) phase failure or phase reversal, (3) overheating of windings due to long continued moderate overload, (4) loss of generator or motor field and (5) reverse current. When any abnormal condition causing the disconnection of the set is removed, the equipment is automatically made ready for service or restarted.

Fig. 1 shows a typical mine substation equipped with an automatic switchboard for controlling a motor-generator set. The apparatus is mounted on a switchboard 76 in. high with a total width of 80 in. On the left-hand and center panels are mounted the clapper

control mechanisms for the starting and running alternating-current oil circuit breakers, the breakers being mounted directly behind the panels. At the top of the first panel are the two alternating-current, induction-type overload relays. At the extreme top of the panels is the control relay for the breaker mechanism.

On the upper part of the second panel are the two

**Fig. 3—Mine-Service Type Automatic Panel**

Compact types which can be set up in small rooms are popular in some regions. This panel shows the complete alternating-current and direct-current switchboard equipment. The oil circuit breakers are isolated on a separate pipe-frame structure.



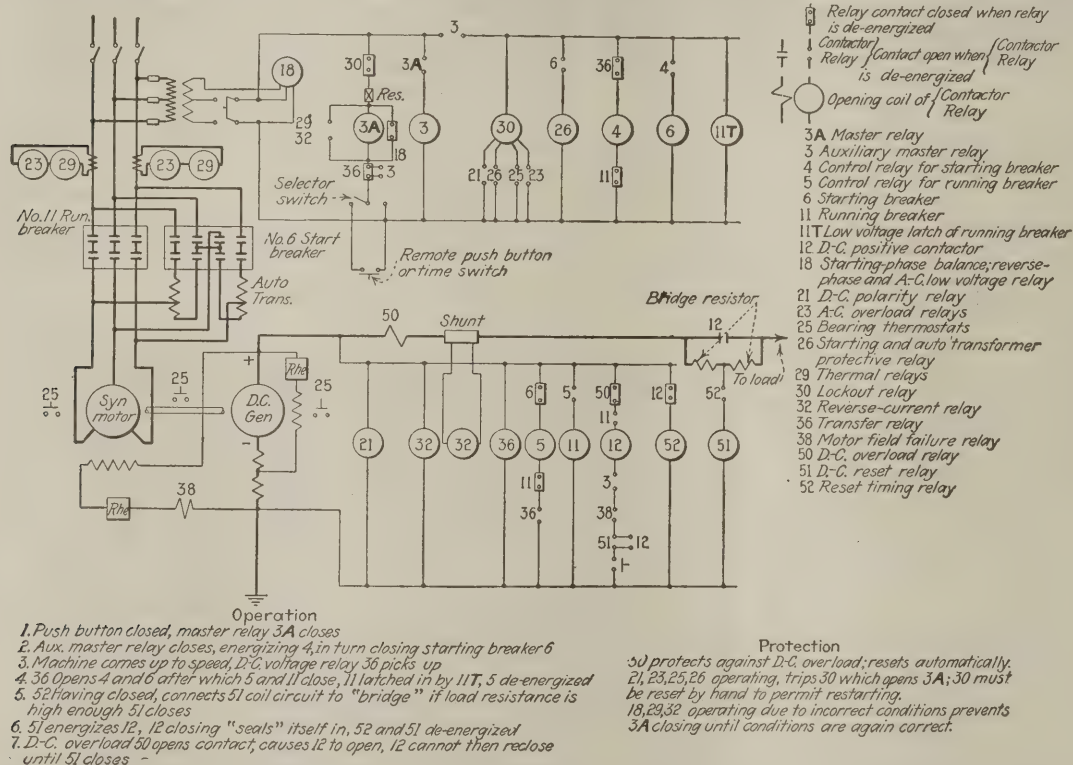
thermal relays, the starting-phase-balance-reverse-phase relay and alternating-current induction-type low-voltage relay. Near the larger control clapper is a control relay for the running breaker mechanism.

The panel on the right is the direct-current and sequence relay board. At the top can be seen the main direct-current contactor with overload and time delay relays on either side. The time-delay relay prevents the direct-current contactor from reclosing until a definite period has elapsed after it has opened. The direct-current voltmeter and ammeter are the round instruments. Below the meters, on the left, are the direct-current reset relay for measuring the feeder-load resistance, the master-control relay which is actuated by the distant-control push-button switch, the starting timing relay for protecting against excessive running on the auto transformer or failure to start properly, the field failure relay which prevents operation in case of field failure, and, on the right, the lockout relay which is actuated by the protective devices to lockout

Also a push-button station is supplied for the control of the substation from a distant point.

A still more compact design is shown in Fig. 3. The oil circuit breakers are mounted on a separate switchboard on a simple pipe structure. Thus all the high-tension equipment easily may be isolated. This switchboard consists of only a single panel with all the necessary relays, etc. The apparatus is substantially the same except that the auxiliary transfer relay has been eliminated. This arrangement greatly simplifies the switchboard and wiring. The lockout relay, shown on the left of the panel, has annunciator dials which indicate which device has shut down the station when a lockout occurs. The reverse-current and polarity relays, not shown, when required, are added on the sub-base panel.

The sequence of operation is quite simple and may be understood by referring to the schematic diagram, Fig. 4. Ordinarily the selector switch is thrown to the left, so that the station is controlled by the push-button



the station. The push-button switch on the left may be used to open the direct-current contactor without shutting down the set, while the voltmeter switch permits reading either the generator or feeder voltage. The single-pole double-throw selector switch in one position controls the set directly from the switchboard; in the other position it permits its control from the distant push-button switch.

The three relays at the bottom of the panel are respectively, the auxiliary master relay, the transfer relay and the auxiliary transfer relay which causes the transfer from the starting to the running breaker when the motor has reached synchronous speed.

When the generator is to feed into a system which also receives power from another source the sub-base section is added to the right-hand panel on which is mounted a direct-current polarity relay and reverse-current relay.

Apart from these panels is a small control transformer for supplying power for the control circuits.

switch. The closing of this switch energizes the master relay 3A which in turn closes auxiliary master relay 3. When 3 closes, the starting breaker 6 is closed by its control relay 4. The motor now being connected through the auto transformers to the line, starts on reduced voltage and comes up to speed. The motor field is connected directly across the armature of the generator, and the induced current in the field tends to prevent the generator voltage from building up. As the motor comes up to speed this effect is lessened, and the generator voltage slowly increases. The generator voltage does not increase proportionately with the speed, therefore it may be used as a safe indication for transfer of the motor to the full alternating-current pressure. The direct-current voltage relay 36, connected across the generator, is set to operate at approximately 80 per cent normal voltage and causes the starting breaker relay 4, and the starting breaker 6, to open, also the running breaker relay 5, and the running breaker 11 to close. The running breaker 11 is



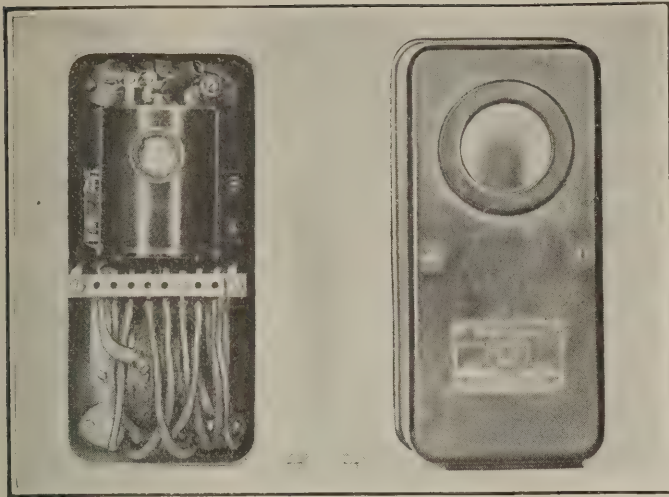


Fig. 5—Thermal Overload Relay

This device is one of the most important protective instruments used on automatic panels. The ordinary overload relay often shuts down a mine substation too frequently. Rarely is the all-day load near the full heating capacity of the generator.

held closed by the low-voltage release 11T; relay 5 and closing coil 11 being de-energized.

When the running breaker is closed and the motor field current is normal the direct-current contactor 12 will close if the feeder resistance is high enough to limit the load to a safe value. This is indicated by the closing of the reset relay 51. If, however, the load resistance is too low this relay prevents the closing of the direct-current contactor.

Should a direct-current overload occur contactor 12 opens by the operation of overload relay 50. A timing relay 52, then closes its contacts after a definite time, bringing into action the reset relay 51 which, in turn, closes or holds open contactor 12 as already explained.

As stated, an automatic switchboard and its accessories not only has the ordinary alternating- and direct-current overload protective relays but also low-voltage and reverse-current protection and other special protective features, which give to the automatically operated station better protection than those which are manually operated. Many of these relays anticipate trouble, they shut down the equipment before serious damage occurs. A short description of the design and operation of the more special relays will be of interest.

The starting-phase-balance-reverse-phase and low-voltage relay is a polyphase induction-type instrument with the windings so designed that (1) the voltage

on the three phases must be approximately balanced, (2) the phases must be of the correct rotation and (3) the voltage on the three phases must be at least 80 per cent of normal to cause the relay to function. It is so connected with the automatic control wiring that the motor-generator set cannot start unless these conditions are correct.

One quite common misapplication of this type of relay has been made in the past. An attempt has been made to use it to protect a polyphase motor from single-phase operation when the motor is running. It ordinarily will not give this protection for the reason that a phase failure on an incoming line will not unbalance the voltages of the three phases of the motor winding appreciably. The motor will operate from a single phase and act as a generator on the other two phases, thus holding up the voltage to nearly normal on the open phases. The relay, naturally, under these conditions cannot detect the phase failure. Its function is to prevent starting or attempting to start under improper conditions. Positive protection against single-phase operation is provided by the use of two thermal relays as explained below.

The thermal overload relay, shown in Fig. 5, is connected in the secondary circuit of the incoming line current transformers. It consists of several spiral bimetallic springs attached to a shaft so that, as they heat and twist, due to unequal expansion, they turn the shaft and close the contacts. The heating is proportional to the current in the line wires and therefore proportional to the load on the motor-generator set. The whole element is immersed in oil and sealed in a brass case, which is surrounded by a heat-insulating sleeve. The design is such that a certain amount of current flowing for a given length of time causes the contacts to close.

If a motor is operating on a single phase, and the loaded phase is beyond the capacity of the winding, the relay in this phase quickly shuts down the machine and saves the winding. The thermal relay also has an advantage over an instantaneous acting phase-failure relay in that a momentary phase failure, which will not harm the machine, will not cause the motor-generator set to shut down. After the relay and motor windings cool the set will restart automatically if the three phases are again balanced.

Just below the babbitt at the bottom of each bearing is located a bearing-thermostat bulb. In this bulb is a liquid which vaporizes and exerts pressure at a fairly low temperature. This pressure is transmitted through a copper tube to a copper bellows which is expanded by the increasing pressure. The elongation of the bellows operates the contacts of the relay which in turn causes the station to shut down. The thermostat, once operated, must be reset by hand so that the maintenance man can see at once which bearing has overheated. The thermostat is designed to operate at about 100 deg. C. which is high enough to prevent it from shutting down the equipment in normal service but low enough to insure operation before there is danger of the bearing being destroyed.

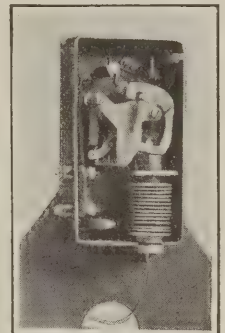
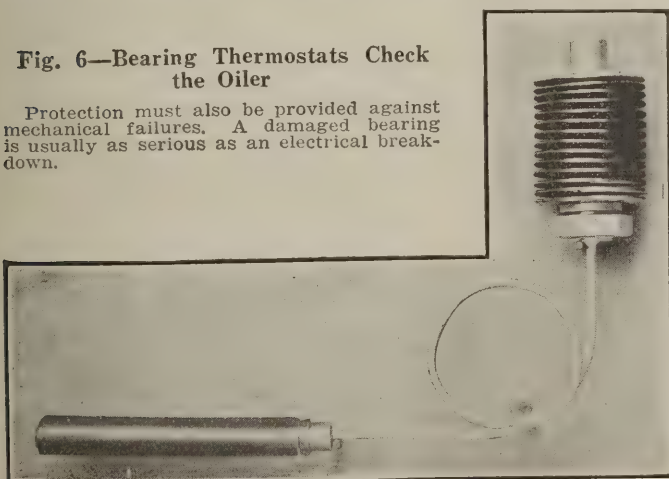


Fig. 7—Thermostat Switch and Bellows

The heat generated in a bearing is transmitted to a bellows which expands and causes a small switch to open the control circuit.

Fig. 6—Bearing Thermostats Check the Oiler

Protection must also be provided against mechanical failures. A damaged bearing is usually as serious as an electrical breakdown.









of water used is comparatively large the head is small. Fig. 2 shows an actual installation of three of these machines in the No. 1 breaker of the Pennsylvania Coal Co. at Dunmore, Pa. In this installation each pump is driven by a 3-hp. motor and handles about 320 gallons of water per minute against a head of approximately 4½ ft., or a pressure of about 2 lb.

The screens in these machines measure about 18½x24 in. and about 15 tons of buckwheat No. 1 are fed to them per hour. This gives, on the average, about 12½ tons of clean coal and 2½ tons of slate and rock. A long series of tests gave the following results on the separation performed:

Average coal in slate.....	6.7 per cent
Average slate in coal.....	7.4 per cent

The coal carried over with the slate and comprising the percentage given above consists of two products, namely, pure coal and heavy but burnable bone. Separating the combustible material in the slate into these two constituents gives the following results:

Average pure coal in slate.....	3.7 per cent
Average heavy bone in slate.....	3.0 per cent

The results given represent average practice with these machines. By changing the adjustments and making them such that a slightly larger percentage of combustible material would be carried into the refuse it would be entirely possible to secure a cleaner coal product. Conversely, adjusting the machines to give a

cleaner rock product would put more slate in the coal. In this connection, however, it should be remembered that any small coal containing less than 5 per cent of refuse is today called a "special" product and commands a premium over the regular market price.

#### SIMPLICITY, LOW COST AND SPACE ECONOMY

The chief advantages of this machine, aside from the excellent work done as has already been enumerated, are its small size, large capacity, great simplicity, and low first cost. From Fig. 2 it will be noted that a battery of three of these machines occupies a floor space of only 12 ft. 1½ in. x 14 ft. When it is considered that each of these machines handles approximately 15 tons of coal per hour the significance of these figures becomes apparent. The simplicity of the device needs no comment, as this is self-evident from the drawings. And naturally, small size and simplicity mean low first cost.

The chief disadvantage of the machine is the large quantity of water that it uses. This is, however, more apparent than real. As previously stated this machine uses approximately 320 gallons of water per minute. This quantity of water is circulated rather than consumed as it is used over and over again, only the makeup water necessary being added. Actual consumption is thus small, as are also the power requirements, each pump being supplied with only a 3-hp. motor as previously stated.

## Gasoline-Driven Generator Runs Hoist And Fan in Emergency

BY ED GUNIA

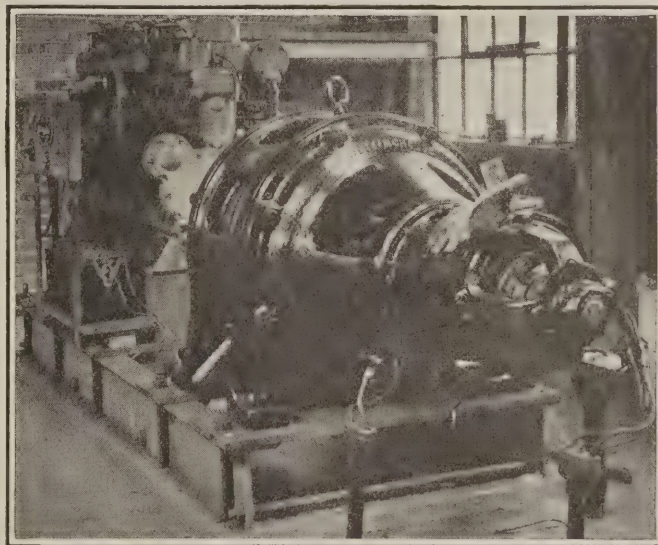
Master Mechanic, Monarch Fuel Co.,  
Rural Ridge, Pa.

THE present-day reliability of self-starting and ignition equipment on gasoline engines recommends them for emergency use when there is a protracted interruption in the flow of current from central power stations. For that matter a steam-driven standby unit also might be kept available for immediate use, but it has the distinct disadvantage of being expensive to maintain, especially where there is no bathhouse or central heating system to utilize the steam pressure that must be maintained continuously.

Having in mind a twofold purpose, first to get its men out of the mine and secondly to keep the fan going when the purchased power is interrupted for any great length of time, the Monarch Fuel Co., at Rural Ridge, Pa., recently installed a 100-kva., 2,400-volt generator driven by a 225-hp. gasoline engine. The power generated by this unit can be used to operate the cage in the supply shaft until all the men are out of the mine, and then it can be switched to run the fan. The change in power is readily effected after the emergency generator is in motion, merely by throwing out the main switch and throwing in an auxiliary switch on the plant end of the bus-bar.

Only one motor is required to drive the fan, whether the latter be operated by purchased power or that coming from the gasoline-driven generator. The 5x11-ft. fan is driven by a two-speed motor, which has a capacity of 37.5 hp. at 430 r.p.m. and 100 hp. at 870 r.p.m., usually developing 110,000 cu.ft. of air.

Normally the hoist is driven by a 150-hp. induction



Gasoline Engine Replaces Purchased Power When Current Fails

Hoist, normally driven by 150-hp. induction motor, is operated by 50-hp. motor when purchased power is not available. Fan cannot be driven till men are all hoisted. Then fan is operated by gasoline engine using same motor as is in use when purchased power is being used.

motor with a speed of 440 r.p.m. As the capacity of the standby generator is not sufficient to drive the main motor of the hoist, a 50-hp. auxiliary induction motor with a speed of 870 r.p.m. is provided. The latter drives the hoist by a chain and a sprocket on the shaft-coupling between the hoist and the main motor. This sprocket is idle when the main motor is in operation and can be bolted in a few minutes to one flange of the shaft-coupling when purchased power for any reason is interrupted.





## News Of the Industry



### Need of Fundamental Coal Information Emphasized During Present Depression

Lack of Government and Association Data Responsible for Guesswork  
Statistics—Benefit Expected from Elimination of Uneconomical  
Mines—Export Trade Offers Big Opportunity

BY PAUL WOOTON  
Washington Correspondent of *Coal Age*

Economists, public and private, are giving an unusual amount of study to the problems of coal. The industry is passing through its worst depression. Foundations are being laid for fundamental changes. It is recognized that tests by fire are productive of some good. The hope is that the destructive forces of the present situation can be meliorated to the greatest extent possible.

An example of the benefits to the industry which are resulting from the depression is the elimination of uneconomical mines. They are being eliminated with all the ruthlessness that characterizes the direct application of the irresistible force of economic law. These mines are going on the bargain counter in increasing numbers at prices which thoroughly justify the statement that they are being sold for a song. In that connection, however, it is pointed out that there is nothing strange in the sale of coal mines at such sacrifices when the spot price is lower than at any time since 1916.

When account is taken of the various wage advances which have taken place since 1916, the unremunerative character of the present coal price is accentuated. Crushing as are the losses which individuals in the industry are suffering, the coal industry is not unfamiliar with these periods when only the fittest survive. The spirit of the industry is strengthened by the necessity of surmounting new obstacles.

#### Statistical Guidance Much Needed

One of the great difficulties in meeting these obstacles is the lack of fundamental information. A large amount of the data which have been gathered by the local associations and on a national scale are not now available. The situation is serious because there never was a time that the coal industry had the statistical guidance essential to its thoroughly intelligent conduct, but the volume of statistics formerly available constituted a veritable plethora of essential data as compared with that obtainable now.

The outstanding, crying need of the industry, however, is for a stock report. Among the operators the feeling is that

stocks are very much lower than is indicated by the various guesses being made. When the fundamental importance of coal is considered it would seem, many point out, that the greatest industrial nation in the world would have available information of this importance. Statistics are most needed in troublesome times. In actual practice, however, the coal industry produces its greatest amount of statistics when they are least needed, and when they are greatly needed the available figures are almost negligible.

#### Better Utilization Is Important

Enough data are available, however, to determine the fact that the state of industry is not alone responsible for the decrease in the volume of consumption. Better utilization of coal is a more important factor than is generally realized. No small amount of coal has been displaced by fuel oil and some reduction in the amount of coal required has resulted from the elimination of small isolated power plants with the growing availability of electricity. Some further losses of coal market are attributable to the development of hydropower.

There are many who think that a portion of our surplus capacity could be occupied were determined efforts made to expand our foreign trade in coal. Much more American coal could be exported were the exporter to expand his business beyond trade in coal alone. It is pointed out that the companies that are making the greatest success of foreign trade are importers as well as exporters. To be assured of return cargoes they invest in foreign tonnage-producing enterprises. In this way and by becoming general traders they are in the position to insure a steady and dependable market for the exported commodity, which constitutes the concern's major interest. It will be recalled that F. R. Wadleigh, formerly Federal Fuel Distributor, for years has been urging return cargoes for ships taking American coal to foreign ports. In his opinion our failure to export more coal has been due to failure to give proper attention to obtaining return cargo.

### Ford's Road Pays 12 per Cent To Employee Investors

The Detroit, Toledo & Ironton R.R., Henry Ford's road, earned 6 per cent on the investment during the first half of 1924, or at the rate of 12 per cent annually, according to an announcement on July 29 to employee stockholders.

Since Nov. 1, 1923, when the railroad launched the plan, the employees have purchased \$162,994 of investment certificates of the road from their earnings.

### Federal Suit for Demurrage At Hampton Roads Piers A Surprise to Operators

The action of the Railroad Administration in making a new attempt to collect bills for demurrage at Hampton Roads during the period of the Fuel Administration comes as a complete surprise to the coal operators who participated in those pools. The matter was gone into thoroughly during the administration of Director General Hines and the bills against the individual operators were withdrawn definitely. Now, after three years, counsel for the Norfolk & Western, the Chesapeake & Ohio and the Virginian Ry., on behalf of the Railroad Administration, are beginning suits to recover some \$500,000 of war-time demurrage charges.

At the time the demurrage was assessed, control of the movement of the coal was in the hands of the Fuel Administration. Car movements were in the hands of the Railroad Administration. The movement of boats was in the hands of the Shipping Board. While the operators were compelled to put their coal in the pools, they had no control over the situation which resulted in the assessment of the demurrage.

It happens that the last thing E. J. McVann did before resigning as secretary of the Smokeless Operators' Association was to convince Director General Hines that the operators were not responsible for this demurrage. Now that he has resumed the office of secretary, his first duty is to go over the whole ground again with James C. Davis, the present Director General. The whole question involved is whether or not one government agency can compel the payment of penalties incurred under compulsion of other government agencies.



## Anthracite Operators to Teach Public How to Heat Homes with Small Sizes

A program of public education on the economy and usefulness of anthracite is to be set in motion by anthracite operators. It will consist of four permanent service stations, one each in New York, Philadelphia, Boston and Washington, where coal consumers may go for definite information on the proper methods of heating a home. These permanent clearing houses of information will be known as Anthracite Economy Service, with every indication that "service" will be rendered with unusual completeness.

A further step in the campaign of public enlightenment will be a traveling exhibit, known as the Anthracite Economy Service Exhibit, with the same broad purpose as its keynote. It will be shown in twenty different cities, a week in each, starting at Portland, Me., the first week in September.

The Anthracite Economy Service will build upon and extend the scope of past efforts to educate the public also in the wider use of smaller sizes, particularly buckwheat. A convincing into-the-home message will be carried to every part of the anthracite-consuming territory special attention being given to encourage the housewife to visit the Service and Service Exhibits. Both dealers and appliance manufacturers have agreed to co-operate.

The first step will be the opening of the four permanent information bureaus, each one showing complete installations of standard devices for the use of buckwheat coal. The personnel of the demonstrating force retained by the operators is the highest; men equipped by experience and training to prove the economy and efficiency of both the coal and the appliances, will be in constant attendance.

The unique traveling exhibit, like the permanent service stations, will be given plenty of publicity and with the dealers co-ordinating it should make a direct appeal to the great body of consumers. As in the case of the permanent service, considerable effort will be spent in showing the home owner and the housewife how to get a maximum of heat in the furnace or the boiler. This will apply particularly to buckwheat, although the broad idea is to show the public how to use anthracite to the best advantage. The extension of the use of buckwheat coal in the small home, however, is the objective directly aimed at.

All of the approved equipment designed for the average dwelling will be shown at all the exhibits. It will include the very newest device, a moderately priced, compact and most efficient unit, including a special grate, blower and automatic control, for burning buckwheat in the smaller size home. Friends of this new device for attaching to the average heater believe that it will play a large part in promoting the sales of small-size anthracite.

Nothing will be sold at either the permanent Anthracite Economy Service Exhibits, their purpose being purely educational. The service will be free to the public.

## Who Dirtied Up This Coal?

Mine 18 of the Western Coal & Mining Co., in Southeastern Kansas, is shut down after a set of rather interesting events. The mine has been delivering coal to the Missouri R.R. on contract. The railroad refused coal because it was too dirty. The mining company could not remedy the situation by placards and requests, so it shut down the mine. This brought some thoughtful miners to their feet, so to speak. They offered to discipline those of their number who were considered responsible for the dirt. But the district union officials wouldn't hear of this. They demanded that Commissioner W. L. A. Johnson, of the Southwest Interstate Coal Operators Association, compel the company to pay each miner \$1 a day for the shutdown. Mr. Johnson refused. So the mine is still down and the argument goes merrily on, while the miners go hungry and the railroad gets coal elsewhere. It is merely one of these occurrences the union mine operator faces every now and then.

## British Miner Worse Off Than American, Kennedy Finds

Writing from Dublin, Ireland, Thomas Kennedy, of Hazleton, Pa., president of District 7, United Mine Workers, describes the results of his investigation of conditions, wages, etc., in England, Scotland and Wales.

"The Miners' Federation of Great Britain, which includes Wales and Scotland," he writes, "has about one-third less members at this writing than it had immediately following the war and up to the strike of 1921. The disastrous ending of the 1921 strike is given by miners' officials as the cause of the decline in membership. The wages of the miners today are about 10s. less than the wages received during the war, or about \$2.50 per day in American money. The wages now being received in Scotland and Wales and generally in England by the mine workers are as follows: Outside top laborers, \$9 per week; inside day laborers, \$2 per day; tonnage miners, which corresponds to our contract miners, are earning on the average of \$3.50 per day. And all time is not being worked by any means. . . .

"We met Hugh Crankshaw, formerly general manager of the Lehigh Coal & Navigation Co., who also was at Cranberry and Harwood. Crankshaw designed and constructed the coal mine at the British Empire Exposition at Wembley, which is a marvelous piece of work and which attracts more attention than any other exhibit. He is located at South Wales, but not now in the operating business, although he is soon to take charge of the largest coal-mining property in Great Britain which will be known as the Anthracite Consolidated Collieries, all situated in South Wales."

## Davis Denies Owning Stock In Any Coal Mine

John W. Davis, Democratic candidate for President, denies that he is interested in non-union coal mines in West Virginia, or that he was one of Charles G. Dawes' "minute men," in a letter printed by a Sullivan (Ind.) newspaper July 29. The letter was sent in reply to a communication from the newspaper made at the request of union coal miners in Indiana. The letter, in part, is as follows:

"I own no stock whatever in any coal mine, union or non-union, or, for that matter, any coal or coal lands. I was never one of Charles G. Dawes' 'minute men.' I have never been opposed to labor unions, and thoroughly believe that they are necessary to the welfare not only of the laboring man but the community as well."

The Rev. Norman Thomas, the Socialist candidate for Governor of New York, launched an attack on Mr. Davis July 30 for his alleged silence on "the continued denials of civil liberty and the right to organize" in West Virginia.

"It seems to me to be an extraordinary state of affairs," said Mr. Thomas, "when it is recommended to labor organizations that a Presidential candidate should not be opposed because he favors the existence of labor unions and does not happen to own stock in a non-union coal mine. Coal stock in bituminous mines is very unprofitable anyway, and Mr. Morgan's attorney probably has better investments."

"The labor complaint against Mr. Davis is that he has never used his great ability constructively for the interests of the people. He accepted without a word of protest the support of the West Virginia delegation, which contained Sheriff Don Chafin, of Logan County, the most autocratic tool of absentee ownership in America."

"As a nominal West Virginian Mr. Davis never protested against the continued denials of civil liberty and the right to organize which has made West Virginia's record a blot on the American escutcheon. In the face of these facts Mr. Davis' letter is ridiculously inadequate."

## New Kentucky-Indiana Railroad May Be Built

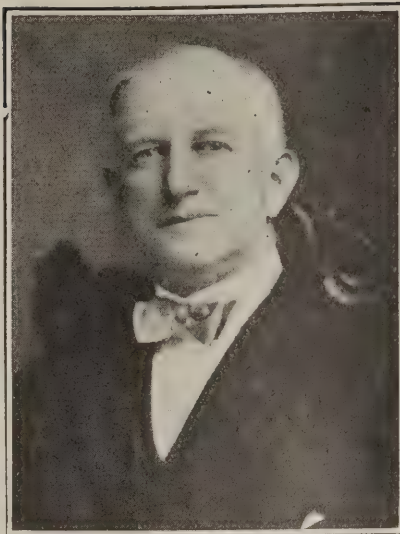
The newest railroad project in the Midwest is the proposed Owensboro, Rockport & Chicago Ry., to run 84 miles from Owensboro, Ky., across the Ohio River and north to Elnora, Ind., making a connection with the Chicago, Terre Haute & Southeastern, which is a part of the Chicago, Milwaukee & St. Paul Ry. If this line is built it may offer a new outlet northward for Kentucky coal, especially from the western Kentucky field. The company is now capitalized at \$20,000 with expectations of increasing this to \$2,500,000 if the Interstate Commerce Commission grants the petition filed this summer for the right to build. The officers of the company are: President, E. T. Franks; Vice-President, D. C. Stimson; Secretary, E. W. Smith, all of Owensboro.



## Coal-Mine Accidents in June Kill 161 Miners; Six Months Toll Is 1,302

Accidents at coal mines in the United States during June, 1924, resulted in the death of 161 men, according to information received from State mine officials by the U. S. Bureau of Mines. The output of coal during the month was 38,151,000 tons; hence the fatality rate was 4.22 deaths per million tons of coal mined, as compared with 3.36 for the previous month, 3.73 for June last year and an average fatality rate of 4.22 for the month of June during the 10-year period 1914-1923. For anthracite mines alone the number of fatalities in June was 53 and the fatality rate was 6.88 per million tons, as compared with 6 for the same month last year and 7.06 for June during the 10-year period. For bituminous mines alone the June rate for 1924 was 3.55 per million tons, as against 3.30 for June last year and 3.68 average for June during the 10 years.

Records for 1924 to the end of June show that 1,302 men have lost their lives in accidents at coal mines. Of this number, 1,049 men were killed at bituminous mines and 253 at anthracite mines. The 1,302 fatalities indicate a death rate of 4.76 per million tons, which may be compared with 3.91 for the first six months of 1923. For bituminous mines alone the 1924 rate for six months was 4.61, as compared with 3.59 for the same period of 1923. For anthracite mines alone the rate for the first half of 1924 was 5.51 per million tons, as compared with 5.61 for 1923.



William C. Atwater

President of the New York coal company bearing his name, who was recently elected president of the Pocahontas Operators' Association, succeeding I. T. Mann.

A comparison of the causes of accidents in the first half of 1924 with those for the first half of 1923 shows that explosions of gas or coal dust continue to be the only class of accidents with increased fatality rates. The comparative rates per million tons for the two half-year periods were:

	January to June 1923	1924
Falls of roof and coal....	1.821	1.846
Haulage .....	.644	.607
Gas and coal-dust explosions .....	.601	1.587
Explosives .....	.197	.143
Electricity .....	.117	.120

## Power Show Exhibitors Rush for Space

Over 260 exhibitors have been assigned space at the Third National Exposition of Power & Mechanical Engineering, which will be held in the Grand Central Palace, New York City, Dec. 1-6. As this is more than twice the number that had engaged space on Aug. 1 a year ago, the indications are that this year's show will be of tremendous interest and importance.

As usual, the exposition will parallel the meetings of the American Society of Mechanical Engineers and the American Society of Refrigerating Engineers. The A.S.M.E. meeting will be held in the Engineering Societies Building, 29 West 39th St., New York City, and the A.S.R.E. meeting will be held at the Hotel Astor, New York City. Plans also are under way by the American Society of Heating and Ventilating Engineers to have a gathering of local sections during the time of the exposition. The co-operation of the various engineering societies has been valuable, as it enables members to attend the meetings and at the same time see the interesting exhibits at the power show.

## Chesapeake & Ohio May Acquire Three Small Roads

The Chesapeake & Ohio Ry. on July 25 asked permission from the Interstate Commerce Commission to acquire the properties of the Ashland Coal & Iron Ry., Long Fork Ry. and the Millers Creek R.R., and also authority to assume outstanding obligations of the companies in order to acquire them.

## Coal-Mine Fatalities During June, 1924, by Causes and States

(Compiled by Bureau of Mines and Published by Coal Age)

State	Underground											Shaft				Surface						Total by States						
	Falls of roof (coal, rock, etc.).	Falls of face or pillar coal.	Mine cars and locomotives.	Gas explosions and burning gas.	Coal-dust explosions (including gas and dust combined).	Explosives.	Suffocation from mine gases.	Electricity.	Animals.	Mining machines.	Mine fires (burned, suffocated, etc.).	Other causes.	Total.	Falling down shafts or slopes.	Objects falling down shafts or slopes.	Cage, skip, or bucket.	Other causes.	Total.	Mine cars and mine locomotives.	Electricity.	Machinery.	Boiler explosions or bursting steam pipes.	Railway cars and locomotives.	Other causes.	Total.	1924	1923	
Alabama	4							1					5													5	10	
Alaska																										0	0	
Arkansas	1												1													1	1	
Colorado		2											3													3	1	
Illinois	4		2										6	1												7	16	
Indiana	5												5													5	7	
Iowa	2												2													2	0	
Kansas	1												1													1	0	
Kentucky	6		1	1									8													8	16	
Maryland		1											1													1	0	
Michigan																										0	0	
Missouri																										0	0	
Montana																										0	1	
New Mexico	1			1									2													2	2	
North Dakota																										0	1	
Ohio	2												2													2	9	
Oklahoma																										0	1	
Pennsylvania (bituminous)	10	1	5			2		2				1	21													21	35	
South Dakota													2													2	0	
Tennessee	2												2													2	2	
Texas																										0	0	
Utah																										0	3	
Virginia	1												1													1	3	
Washington	1										2		3													3	4	
West Virginia	18		12			2		3					35												2	39	3	
Wyoming	3	2											5											2	4	39	33	
Total (bituminous)	62	6	21	1		4		6		2		1	103	1					1	1	1				2	4	108	150
Pennsylvania (anthracite)	15	4	4	19		3	2	1				3	51	1					1	1	1				2	5	53	52
Total, June, 1924	77	10	25	20		7	2	7		2		4	154	2				2	2	1	1				2	5	161	
Total, June, 1923	95	9	42	15		12	2	5				7	187	1		1			2	1	1	1		6	4	13		202



## Lee Says Coal Mines Disrupt Railroad Industry

Interdependence of railroads and mines was emphasized by Elisha Lee, vice-president of the Pennsylvania R.R., at the second annual banquet of the Fayette-Greene Coal Producers' Association, July 31, at the Summit Hotel in the mountains near Uniontown, at which M. D. Cooper, of the Hillman Coal & Coke Co., of Pittsburgh, presided. Mr. Lee said both mines and railroads were subject to wide variations in activity, the carriers even more than the producers of coal. When the coal business is depressed coal operators can close down or stimulate trade by lowering prices. The railroads are so strictly regulated that they cannot do the first at all and the second only when granted permission by the Interstate Commerce Commission.

### Coal Traffic Important Item

The importance of coal traffic to the railroad is immense. That traffic on the Pennsylvania R.R., said Mr. Lee, is three times that of its nearest rival, sand and gravel, and six times that of iron and steel. On the Pennsylvania Railroad, 38 per cent of the traffic is in bituminous coal and 6 per cent anthracite. Of every 10 tons of coal produced 3 tons are consumed by the railroads.

G. W. Galloway, vice-president, Baltimore & Ohio R.R., said that in his forty-one years of railroading he had never seen so friendly a feeling between railroads and the public. Last year the railroads decided to spend 1.4 billions of dollars for better transportation facilities. The program was fairly under way when the volume of business began to decline. At present 300,000 freight cars valued at \$2,500 each and 7,000 locomotives worth fifty to sixty thousand dollars apiece were standing idle, the equipment being worth one and a quarter billion dollars.

### Much Invested in Idle Equipment

Mr. Galloway asserted that the B. & O. R.R. alone has 42 million dollars invested in idle equipment that is in running order and that a non-union territory had shipped 800,000 tons of coal to markets which formerly were supplied by union mines on the B. & O. The average production cost per ton at the open-shop mines is \$1.40 and the freight rate \$1.91, a total of \$3.31. The cost per ton at the union mines is \$2.20 and the freight rate \$1.60, a total of \$3.80, leaving a wide differential on the delivered coal. Coal from this particular field has been shipped all rail to Nebraska. His railroad has a tide-water dock idle in a southern port that cost over \$3,000,000.

Harry L. Gandy, secretary, National Coal Association, said that one-fourth of the revenue of the railroads came from coal traffic and urged that the railroads should not try to "beat down" the price of coal. The gain, said he, from such practices is only temporary and is certain to reflect on the industry by which the railroads largely earn their living.

Fuel, he declared, is no burden on the manufacturer. In 1913 it represented

## No Evidence Anthracite Operators Violate Law

In answer to J. J. Rogers, representative from Massachusetts, Attorney General Stone declares that the Department of Justice has failed in its investigation to find any evidence that anthracite operators are violating the law in the prices they are charging for coal to New England purchasers, and that no immediate action would be taken toward the prosecution of the operators unless damaging evidence is revealed. The Department could find no evidence of a combination or a monopoly to cause a coal shortage or raise the prices of anthracite. The investigation was made at the request of Representative Rogers.

only 2.6 per cent of the total cost of the finished products, and today it should be far less. Overproduction was due to an excessive demand for coal during the war. Walter Barnum, treasurer of the Pacific Coast Co., said the Washington Coal Producers' Association had given careful engineering study to the use of oil and when new buildings and houses were erected the association got in touch, chiefly by letters, with the owners urging the use of coal-burning equipment for heating.

## Utility Coal Consumption and Power Output Drop Again

Electric public-utility plants consumed 2,701,106 net tons of coal during June, according to a report by the Geological Survey. This compares with 2,816,352 tons consumed in May, according to revised figures. Fuel oil consumed by utility plants in June totaled 1,306,140 barrels, compared with 1,207,473 barrels in May.

The average daily production of electricity by public-utility power plants in June was 152,600,000 kw.-hr., or about 1 per cent less than the daily output in May. The seasonal decline during May and June has been greater this year than usual, due to the general industrial depression.

## Erskine Ramsay Donates \$100,000 to Dormitory

To the million-dollar fund being raised for Alabama College at Montevallo, Erskine Ramsay has given \$100,000 to be used toward the construction of a Woman's Dormitory which is to be known as "Janet Ramsay Hall" in memory of his mother. The dormitory will cost about \$220,000. Mr. Ramsay has made his fortune in the operation of mines in the State of Alabama and in the sale of his rights to valuable inventions made by him for the construction of mine machinery. Two years ago he gave an equal sum for the construction of the Erskine Ramsay Engineering Hall.

## Unionization Drive on Again In West Virginia

Another union ultimatum, which may presage disturbances in West Virginia coal mines on a wide scale, has been issued by Van A. Bittner, who was appointed by John L. Lewis, president of the United Mine Workers, to direct union affairs in northern West Virginia. In addressing a crowd of miners at Scotts Run, Bittner stated that West Virginia would be unionized—peacefully if possible, but unionized at any rate.

"We must make union men out of all the scabs on Scotts Run in the regular manner, or by stronger methods if necessary—you know what I mean," he said. Amid the ensuing excitement in the crowd, which numbered close to 6,000, there were loud denunciations of local police officials, coal-mine owners that held out against the union's demands, and even a former Governor of the state.

"We will not stop until Monongalia County—and West Virginia—is 100 per cent union," continued Bittner. "We must preach the gospel of the United Mine Workers. We all know that to spare the rod is to spoil the child. But it is not necessary to try violence. I hope that none of you will attempt violence. We can unionize this field if we will. What group of non-union men is there anywhere that would refuse to join the union if they were pressed to do so by thousands of union members?"

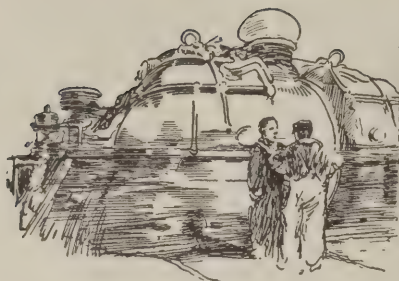
It is reported that similar plans are in the making for the other West Virginia fields lost to the union in the last two years.

Scotts Run has been the center of much violence during the last few weeks. An intensive campaign to unionize the district has been in progress, during which men have been shot down, buildings have been burned and men have been beaten on their way to work. The Scotts Run meeting, however, was not entirely a local affair, for, according to the mine owners, the union officials brought in a large number of union men from Taylor, Harrison and Marion counties, in order to muster a large crowd.

## Export Shipments for Fiscal Year Advance 8 per Cent

Bituminous coal exports during the fiscal year 1924 amounted to 17,203,193 long tons, compared with a total of 15,953,879 tons during the preceding fiscal year, an increase of 7.8 per cent. For the six months, July-December, 1923, bituminous exports were 9,984,305 and for the six months, January-June, 1924, the total was 7,218,888 tons. Exports for the corresponding periods of the fiscal year 1923 were, respectively, 6,783,203 tons and 9,170,676 tons. During the first half of the fiscal year 1924 (July-December, 1923) exports were stimulated by the low production in the Ruhr coal fields, which increased the demand for our coal in Western Europe and South America in particular. This stimulus did not exist during the last half of the fiscal year (January-June, 1924) and exports were 2,765,417 tons or 27.7 per cent less than for the first half of the fiscal year.





## Practical Pointers For Electrical And Mechanical Men



### Simple Tool for Resurfacing Seats of Tube-Hole Covers in Boilers

**Square Piece of Board Is Set on Bit-Brace Shank—  
It Is Covered with Sandpaper or Emery Cloth and  
for Grinding Headers Has a Circular Pilot Block**

Those who have had charge of water-tube boilers at mine power plants well know the difficulty sometimes experienced in grinding in tube-hole caps on the headers. Unless the cap fits the header almost perfectly the joint will leak when pressure comes upon it. Various machines have been devised to perform this work, most of which give excellent results. The mine power plant engineer, however, is often "up against" the proposition of making a tight joint of this kind when no grinding machine is available.

To facilitate performing this operation, the tool shown in the accompanying illustration has been devised. This may be built in any mine shop. It consists of a square piece of  $1\frac{1}{4}$  to  $1\frac{1}{2}$  in. plank *A*, surfaced at least on one side. It should be large enough so that it will a little more than cover a tube-hole opening and the cap seat surrounding it. On one side of this piece is fastened a shank *B* terminating in a square tapered head suitable for holding in a bit brace. On the other side of the block a sheet of sandpaper or preferably emery cloth, *C*, may be attached either by glueing or tacking. For grinding on headers a circular pilot block *D* may be screwed on over the sandpaper or emery cloth.

A convenient way of attaching the emery cloth is shown at *E*. A square piece of cloth is first cut or torn, its length and width being made equal to

that of the block *A* plus twice its thickness. The block is then placed upon this square piece of cloth, approximately centered, and diagonal or miter cuts made from the corner of the block to the corner of the emery cloth. The edges of the cloth are then carefully folded up along the edges of the block and a tack driven in the middle of each side as shown at *F*. The mitered corners may now be folded over and tacked as shown at *G*.

For grinding tube-hole caps the pilot block *D* is left off. In this operation a drill press, a boring machine or any other means of holding and spinning the grinder block may be used with advantage. If covers are held in the hand while being surfaced, however, care should be taken that too much

pressure shall not be exerted between the cover and grinding block, because if much pressure is applied the cover is liable to be jerked out of the hand.

Although grinding the cover seats on headers with a block of this kind revolved in a brace is by no means as rapid as facing them by means of a grinder designed for the purpose, it is much faster than facing with a wooden block and wet sand or with a hand block and sand paper. A variation of the scheme here shown would be to turn and face the block *A* in a lathe, and forge a collar on the shank, against which the back of the grinding block seats. The shank, however, extends through the pilot block as well as a washer and nut, this arrangement being shown at *K*. A sandpaper disk with a hole in its center may then be clamped between the grinding block and the pilot, the paper needing no other fastening. This answers every purpose for surfacing cap seats on headers, but for surfacing the caps a thin washer for holding the sand paper is necessary. Other variations in design will doubtless occur to those operating this tool.

### Box on Casters Facilitates Handling of Armatures

By C. E. REYNOLDS

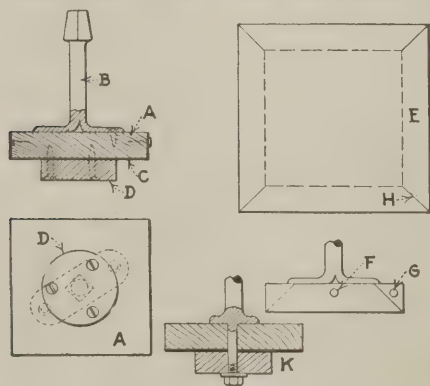
Superintendent, Allegheny Pittsburgh Coal Co., Logans Ferry, Pa.

The Springdale mine of the Allegheny Pittsburgh Coal Co., Logans Ferry, Pa., has a way to handle heavy armatures, that ought to be adopted by all coal companies having electrical equipment. Spare armatures are kept in wooden boxes on ball-bearing casters, by which means they can be moved by one man from the storeroom to any part of the shop, providing the floor is smooth, as it should be. Faulty armatures are placed in the box from which the spares are removed. It is just as easy, by means of a crane, to lower an armature into the box or to lift it out, as it is to raise it from or lower it to the floor. The scheme eliminates all the labor involved in handling armatures by trucks and also provides a receptacle for storing them.

The bottom of the box is made of  $1\frac{1}{2}$ -in. boards, and the sides, which are nailed to 2-in. inside corner posts, are of 1-in. stuff. Two iron straps are screwed to the sides and the bottom of the box on the outside of the corner posts. The inside of the box may be arranged to allow the armature to rest on its shaft in two end supports or it may be lowered to the bottom.



Castered Box Supports Armatures



#### Emergency Seat Resurfer

This shows the simplicity of construction—a shank to fit a bit brace, a piece of plank, a sheet of sandpaper, a circular block to serve as a pilot and a few tacks and screws are all the materials necessary.



## Anneal Your Boiler Tubes Before You Roll Them

Boiler tubes are fastened in place by being expanded into the header or sheet. The ordinary type of expander consists of three rollers held in a hollow cage through which a tapered mandrel passes. The cage with its rollers is inserted in the tube, the mandrel driven lightly and then revolved by means of levers passing through its upper end or head. This stretches the tube and forces it against its seat in the header or drum sheet.

In order to roll a tube properly and make a tight joint it is necessary to crush the metal of the tube against the metal of the boiler sheet or header. Dirt or grease between the tube and the surface against which it seats is fatal to a good joint. For this reason it is necessary to clean thoroughly both the end of the tube and the inside of the hole into which it is expanded.

Most tube holes in boiler sheets and headers are reamed to size at the factory, and the reamed surface protected from rust, by means of a coating of heavy grease or paint. This must be removed thoroughly before a tube is inserted if a tight joint is desired. The end of the tube, likewise, should be cleaned with a file and all rust and scale scraped or filed off. It is not necessary to polish the end of the tube, but it is essential to secure clean bright metal. In other words, it matters little how rough may be the end of the tube so long as bright metal is exposed.

As sent out from the factory most boiler tubes are merely cut to length and bent to the proper shape if bending is necessary. Particularly if they are to be expanded into a thin sheet—one  $\frac{1}{2}$  in. thick or less—it is advisable to anneal them before expanding. This may be done in an ordinary blacksmith's forge, or if such a forge is not available their ends may be heated in the furnace of another boiler or even in an open fire.

In this annealing process it is necessary to heat only the end of the tube as this is the only portion that is acted upon by the expander. To do this is quite simple. First stuff a piece of waste, a handful of rags or even a wad of old paper into one end of the tube. Build up a good-sized fire or one big enough to thoroughly cover the end of the tube for a distance of about 4 in. Insert the open or unplugged end of the tube and turn it slowly until it shows an even cherry red over its entire circumference. The tube may now be removed from the fire and laid to one side, but so supported that its hot end touches nothing. When cool the other end may be treated in a similar manner.

This simple process is ordinarily all that a boiler tube needs in the way of an anneal. If, however, a particularly soft tough tube is desired, proceed as before but upon removing it from the fire, bury the hot end in air-slaked lime. This will greatly prolong the period of cooling and render the metal soft, tough and ductile.

The object of the plug in the cool end of the tube is to prevent the circulation of air. If it is not used the

entire tube will become too hot to be handled with the bare hand. Again, if the end of the tube is buried in lime the plug should not be removed until the end is cold as otherwise the tube will cool faster than is desirable.

## How and Whys of Processes For Tempering Steel

Every blacksmith knows how to temper ordinary high-carbon or tool steel in the ordinary way, that is, in water. As usually practiced this process consists in heating the tool to be tempered to the required cherry red, plunging it in water, polishing and then "drawing" it to the required color in a muffle or by some other means of heat application. When tempering in oil the process is substantially the same but variations may be introduced.

Certain tools, such as knives and wood-cutters, require what is known as a "spring temper." This corresponds to drawing to a blue color after chilling and polishing. Metal-cutting tools should be drawn to a "straw" tint. Of course, this color may be obtained in the ordinary manner, but sometimes the person doing the tempering is in a hurry or the tool is needed quickly. In such a case the method of tempering about to be described may be employed to advantage.

### QUICK METHOD OF TEMPERING

It is applicable only to oil tempering and for best results fish oil should be used. The sequence of operations is as follows: Heat the tool to the usual cherry red and plunge in the oil. Next return the tool direct to the fire and heat again, watching it closely. When the oil adhering to the tool begins to burn, plunge again, but this time in clear cold water.

This method of tempering is more suitable to work of fairly thick cross-sections than to those that are drawn to thin edges, as in this latter case the edges become appreciably hotter than the body of the tool, resulting in either a hard brittle edge and a soft center or a soft edge and a brittle center.

The reason that this procedure is successful is because the burning or ignition temperature of the oil is approximately the same as that at which the blue color appears when the temper is drawn in the ordinary manner. A little practice will soon give fairly satisfactory results with steel of uniform quality or carbor content.

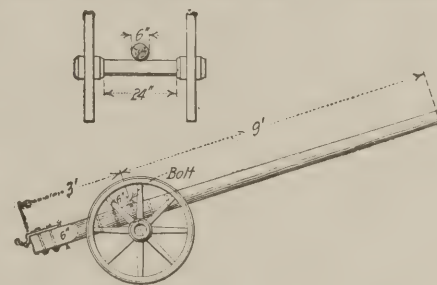
Another short cut or "stunt," where a medium hard but tough point or edge is desired on a tool, is to add soap to the water in which the tempering is done. The action of the soap is, of course, to make a suds, or in other words, to make a tough skin surrounding the steam bubbles which form when the heated steel is plunged in water. This performs a dual function. First, the more or less effective screen or protection of steam around the hot metal retards chilling somewhat and renders the steel softer and tougher than it would be if cooled in plain water. Second, when the end of a piece of heated steel is dipped in water there is a well defined line between the water

and the air, with the result that a flaw is liable to be "thrown into" the steel at this point. This may result in a fracture of the steel later on. Soap in the tempering water, by forming the screen of steam already alluded to, protects the steel from flaws at the surface of the water, as in this case the surface of the chilling fluid is not distinct or clearly defined.

The result is that the line between hot and cold metal is likewise indefinite. In other words, instead of having a definite line around, or rather plane extending through, the metal being tempered, on one side of which the metal is hot and on the other cold, a transition zone is introduced. Thus the metal grades gradually from hot to cold throughout an appreciable distance. This graduation in temperature is unfavorable to the formation of flaws.

## Telephone Pole Puller for Surface Work

In the accompanying sketch are shown the essential features and construction of a simple and easily constructed device for which a number of uses will be found about the mine property such as the "pulling" of telephone



### Lifts Poles and Posts out of Their Holes

It will also lift mine cars. The axle and wheels act as a movable fulcrum and the long pole furnishes the leverage. This puller can be used to lift light loads whenever it is possible to move it on its wheels to the point of application which, unfortunately, cannot always be done.

and trolley poles and fence posts, and the lifting of cars. In constructing this device discarded wagon-wheels, cast-iron pulleys or any other wheels of suitable diameter and construction may be used.

When wagon-wheels are used a piece of well-seasoned hickory or oak is used for the axle, the ends being turned down to fit the wheels and left long enough to provide for washers and cotter-pins to hold the wheels in place.

For a lever a pole of well-seasoned wood 6 in. in diameter and about 12 ft. long is provided and furnished at the lifting end with a good strong iron hook of suitable design. Several  $\frac{1}{2}$  in. holes should be drilled about 6 in. apart to provide for the adjustment of the lever to suit the work to be done. The lever is fastened to the axle by a bolt passing through one of these holes and through a hole of the same size in the axle.

In pulling poles with this device a couple of half hitches are taken around the pole with rope or chain the ends of which are fastened to the iron hook on the end of the pole.





## Problems In Underground Management



### Why Not Connect Butt with Inbye Face Heading and Speed Up Haulage?

Practice of Leaving Empties in One Entry and Taking Loads from  
Another Makes the Turn Slow and Wastes  
the Effort of the Locomotive

BY ANTHONY SHACIKOSKI  
Homer City, Pa.

COAL MINING today is a dual problem consisting of two distinct operations—the actual production of coal and its transportation from the working face to the tippie or shipping point after it has been mined. In many instances getting loads away from and empties to the face is quite as difficult a task as actual coal extraction.

In many mines, after a trip is loaded, the men must wait while the locomotive takes it away and returns with a trip of empties. Time lost in this manner sometimes runs from 30 to 50 per cent of the entire working day. In many cases also, this causes a corresponding loss in output. A suitable track layout in rooms and headings might do much to obviate this loss.

#### SERVING HEADINGS IN PAIRS

Fig. 1 is an imaginary mine map illustrating the track layout at present used in many mines. With the track

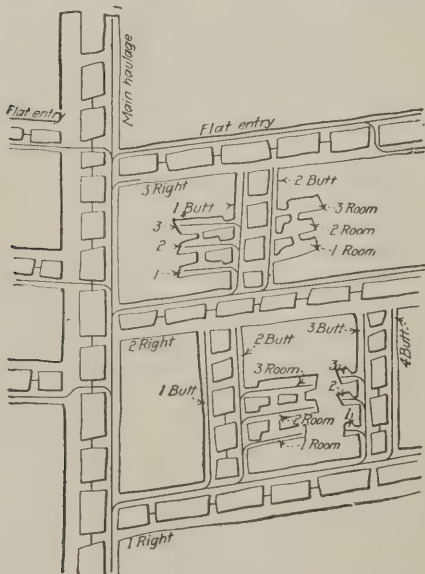


Fig. 1—Haulage System Usually Employed

This shows a portion of the map of a short wall mine and the track layout usually used. Much delay is encountered in switching loads and empties to and from the working faces.

system shown loaded cars are pulled, and the men wait until empties are brought back and placed.

The motor enters the butt entries light, pushes the loads back until the trip is complete and together. The cars are then coupled, and the locomotive pulls the trip away. If, however, there is any appreciable grade on the entry the locomotive will be unable to push the cars together, in which case they will be dropped down to the locomotive. This will cause a further loss of time.

For purposes of illustration let us assume that in No. 2 butt entry off No. 1 right there are 10 rooms with two men working in each. In order to give each man one car each trip, the locomotive must haul trips of 20 cars. Suppose also that in No. 2 butt entry off No. 2 right similar conditions prevail.

Now, in accordance with the layout, the locomotive serving these entries must either pull the cars into them and these cars must be switched into the rooms by hand in order to let the locomotive out, or the locomotive must push the cars into the rooms. If the cars are pushed and there is even a slight grade, the work of the locomotive is difficult. Again, the pushing is done against the room switches, and if these are even slightly defective more time is liable to be lost by derailments.

#### REVISED PLAN AFFORDS MOBILITY

A layout only slightly different but much more efficient is shown in Fig. 2. All butt entries are here connected at both ends with the flat entries. It is thus possible for a locomotive to enter any butt entry from either end. Accordingly, when a motor starts to make up a loaded trip and pull it from any butt entry it takes with it as many empties as it will gather loads. It enters the butt from one end pushing the loads before it and placing the empties behind it. The entry may be approached from either end and thus advantage can be taken of any grades that may exist.

Suppose that a trip is to be gathered in No. 2 butt off No. 1 right. The

locomotive comes up the main haulage road pulling the empties, turns into No. 2 right, then down No. 2 butt off No. 1 right. When the loads are reached the locomotive uncouples from the empties, gathers and pushes the loads up the butt entry. When all the loads are together the motor returns to the empties and places them. Thus the men do not have to wait any great length of time for empties as these are placed at the faces soon after the loads are withdrawn. After the empties are placed, the locomotive returns to the loads, pushes them out into No. 1 right and from there hauls them to the parting or tippie.

#### SHOULD SAVE MUCH TIME

A system of haulage such as this greatly decreases the lost motion of gathering loads and placing empties. It is estimated that it will increase the output by from 30 to 50 per cent and the output per man per day in a like proportion. This, however, depends upon conditions, that is, all considerations of grades and the like must be kept constantly in mind in laying out the trackage system above outlined.

It should be remembered that the success of any system such as this will depend largely upon the skill with which it is laid out, and how fully the designer takes into account the conditions encountered.

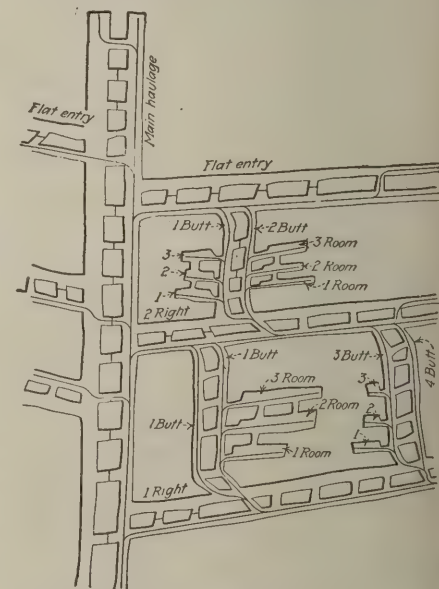


Fig. 2—Revised Mine Layout and Haulage System

Arrangement of entries and rooms is practically the same as shown in Fig. 1, but the track arrangement is such as to facilitate gathering and haulage. It is estimated that large savings can be made where this track plan is adopted.



## Discussion

### Should We Be Content with Ten per Cent Of Rock Dust in Our Mines?

Not Only Should Rock Dust Be Used in Quantity but the Workings Also Should Be Wetted Down Where Machines, Shooting of Face and Dumping of Coal Underground Make Coal Dust

THE DISCUSSIONS of safety problems, in connection with the lectures of the British safety expert, Doctor Wheeler, and the joint meeting of the several mining engineering societies and the Coal Mining Institute of America, as reported in *Coal Age* March 20 and 27 and April 3, were certainly both instructive and interesting. There are a few important statements, however, that in my opinion require further explanation; statements which, without qualification, I am sure must have mystified the average reader of *Coal Age* as they did myself.

The first statement to which I would draw attention to is this: "In the United States the mines may not have to maintain so large a percentage of incombustible matter to obtain an equal immunity (from coal-dust explosions) with that of British mines. An addition of 10 per cent of rock dust is well worth striving for." Now, what does this statement mean? Does it infer that we already have a large percentage of incombustible matter mixed with the rock dust in our mines and that an addition of only 10 per cent of rock dust is now required to give us the same immunity from dust explosions that English mines have with 50 per cent of rock dust?

Mr. Rice says, as quoted on page 463 of the issue of March 27. "The coal-dust hazard is more serious in this country than in England." Our own Bureau of Mines, experimenting on the fine dust of Pittsburgh coal, has found that a mixture containing 60 per cent of fine shale dust free from combustible matter or 60 per cent of limestone dust is necessary to prevent the ignition of the mixed dust by a blownout shot and that 75 per cent of either of these kinds of dust was required to prevent the propagation of an explosion that was once started.

This percentage would have to be maintained as a pretty general protection in nearly all the bituminous, lignite and lignitic coal districts of the United States. It seems now to be general knowledge that the explosiveness of coal dust depends, other conditions being the same, upon the ratio of the volatile matter to the total combustible matter, and Mr. Rice and Mr. Conner emphasized this point strongly in answer to Mr. Fear's question.

That being so, the Pittsburgh coal dust which has a ratio of 0.40 requires to be mixed with 60 per cent pure rock dust to be 100 per cent immune to explosion. In widely scattered sections

of the United States we find this ratio equalled and in some sections surpassed. The ratio of the volatile matter to the total combustible in coal in a few representative districts may be interesting in this connection. These are given in the accompanying table.

#### Ratio of Volatile Matter to Total Combustible in Various Bituminous Coals

Pittsburgh, Pennsylvania .....	0.40
Upper Freeport seam, Pennsylvania and Ohio .....	0.42
Hocking Valley, Ohio .....	0.42
Thacker, West Virginia .....	0.38
Vanderpod, Kentucky .....	0.38
Scott County, Tennessee .....	0.40
Jefferson County, Alabama .....	0.36
Streator, Illinois .....	0.45
Rose Hill, Iowa .....	0.49
Brazill, Indiana .....	0.41
Osage, Kansas .....	0.49
Rocky Fort, Montana .....	0.48
Rock Springs, Wyoming .....	0.40
The ratio of the lignite and lignitic coals of Wyoming, Utah, Oregon, Texas, and California range from 0.48 to 0.56.	

In view of the data in the table why should we even suggest that an addition of 10 per cent to our coal dust would serve a useful purpose when we know well that 60 per cent is necessary? Would it not be better to boost for 100 per cent protection for our lives and property than to run the risk of the partial protection that 10 per cent of rock dust might give?

With reference to the advantage gained by the use of 10 per cent of rock dust in the dust mixture which is said to give a flame traveling at 425 ft. per minute, I may say that I presume I should be as dead after being caught in such a flame as if it were traveling at a higher velocity, and in any case the afterdamp would be, to say the least, embarrassing.

The second statement I have in mind relates to the economic comparison between the different systems of humidification and rock dusting. Now how can rock dusting be compared with the different systems of humidification for the purpose of selection when all of the authorities in the discussions contend that water should continue to be used in connection with the application of rock dust?

Doctor Wheeler admits that he would like to see a limited quantity of water added with the rock dust, and Mr. Rice says that water should continue in use, for thereby the air currents will be prevented from carrying coal dust. He refers to the fact that cutting machines in Alabama are equipped with spraying devices. To supplement my argument that a combination of watering and rock dusting is considered

essential to safety, I would instance the Utah State Industrial Commission which has adopted a safety code requiring among other safety measures: Rock dusting in all mines, use of water for cutting and loading machines, sprinkling at every face, etc. So that in a great many cases where rock dusting is established in the future it will not be a reduction but an increase in safety expense.

I do not wish for a minute to give the impression that I am opposing rock dusting, but I think it is better to know what conditions we have to meet before we rush into the use of any single dust explosion preventive, to learn later that water is also necessary. Undoubtedly water is needed as a dust preventive in machine mining and where rotary or any type of dump is used inside a mine. In my opinion, the first line of defense is water on the machines in machine mining.

JOHN WALLS, SR.

Bayview, Ensley, Ala.

### Leave Four Inches of Bottom Coal to Support Machine

In regard to the "Difficult Problem" proposed by a West Virginia operator on page 22 of the issue of *Coal Age*, July 3, I would suggest cutting within the upper 48-in. body just high enough that the underlying coal would have sufficient strength to support the machine. Possibly a very thin "scrapping" will do this. Perhaps it need not be any thicker than 4 or 5 in. This scrapping should always be left one cut back of the face to hold the machine at the proper elevation for a second cutting and to permit of the shoveling being done free of the top of the soft slate below it.

E. A. SMITH,

Chief Engineer.

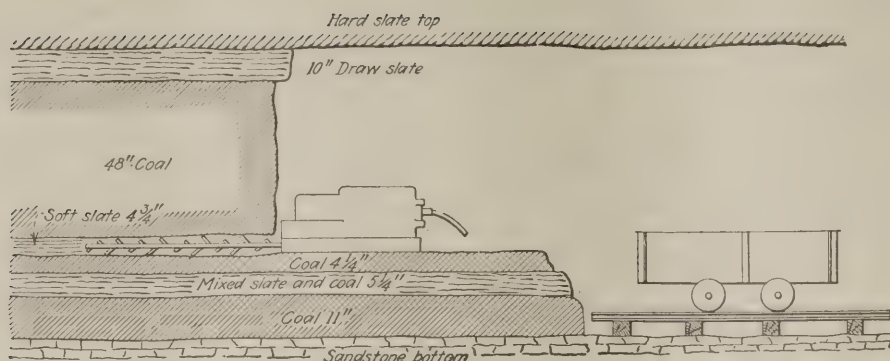
Wells-Elkhorn Coal Co.,  
Estill, Ky.

### Makes His Cut in Soft Slate

Our solution of the "Difficult Problem" propounded on page 22 of the present volume of *Coal Age* is, of course, tentative because it is impossible to describe all the conditions so clearly that a definite plan of operation can be made without a physical investigation, and this the writer seemed to realize for the details he supplies are scant.

We suggest that he try cutting the band of soft slate which is 4½ in. thick, amply thick to accommodate the average cutter bar of standard shortwall mining machines. This method of mining would allow the machine to rest on the 4½-in. band of coal which it is presumed is not like the coal in the main seam, so weak that it will not support the machine without skids, but if they are needed they could be used. An attempt should be made to use only chisel bits in cutting the coal as by this means the kerf will be better cleaned. This much would have to be removed as fast as it accumulated. It should be shoveled back into the gob. A long straight-handled shovel could be used to remove the muck from under the coal before it is drilled and shot down. If the machine did not work satisfac-





#### Method of Working Coal with a Soft Slate Floor

Coal is undercut in soft slate using chisel bits which clean out the cut effectually, the machine resting on the solid coal below the slate. The thin coal and rash is gobbed or loaded out and the thicker coal below it is "pop-shotted" and sent to the tippie.

torily with only chisel bits in the cutting-chain, they could be used in large proportion or perhaps in every other position along the chain. By thus cutting in the shale practically all of the 48 in. of good coal could be saved. Even if the machine cut up into the bed of coal above or into the band of coal below little if any damage would be done.

It is not clear from the information given whether the operator intends to mine the 11 in. of coal, but if it is to be saved we presume the 4½ in. coal and the 5½ in. of slaty coal will be stripped and gobbed and perhaps some of it loaded out as waste. We would suggest that this be tried and that the labor costs be carefully balanced to ascertain if the mining of this coal would

be profitable. It might pay in some localities and not in others. Of course the 48-in. coal would be cut, shot and loaded before any attempt was made to remove the lower coal because with this arrangement the coal floor can be used to shovel on. The diagram shows the track on the sandstone bottom. If the 11-in. band is saved it probably can be lifted by light "pop shots." If it is not saved the coal and slate probably will support the room track and machine. This would have to be determined by experience. In entries this method of removing the bottom seam would leave little if any top to be taken.

A. L. PLAN,  
GRADY H. EMERSON.

Birmingham, Ala.

#### Does Water Add to Violence Of Dust Explosions?

Some years ago a paper on the rates of explosions in gases was prepared by Professor H. B. Dixon, then of Manchester College, England, who was a noted authority on explosives. This was contributed to the North of England Institute of Mining Engineers. In this paper he epitomized the results of a long series of experiments proving how much moisture it was necessary to add to various explosive gases and air in order to make them exert their maximum destructive velocity and force.

He proved that it was necessary to add no less than 5 per cent of moisture per cubic foot of air and that as this heavy content of moisture could not be mixed with air by any of the usual means of dampening it he would be compelled to use steam. Incidentally, therefore, he proved that in coal mines where explosives were in use the dampening of the mine air could not possibly exert any restraining influence on the flame of the explosive, but would, on the contrary, tend to increase its force.

This important paper does not appear to have caused any notable discussion among the members of the Institute, and the facts as stated appear to have been accepted as incontrovertible and as leaving no loophole for discussion.

In view of the great emphasis that has been laid on the watering of coal mines during recent years, and still is laid on it, this becomes a remarkable

fact not easily explained. But it will be noted that when the British Government concluded its report on the "Prevention of Explosions from Coal-dust," it had no alternative but water in some form to suggest as a remedy, and therefore it became a question of the quantity of water to be used, which practically led to great laxity in the way the law was enforced. In deep collieries there was another material reason for not using large quantities of water, namely, that for the comfort and efficiency of the miners the ventilating air current should be kept as dry as possible in order to carry off the perspiration from their bodies and give them a sense of coolness.

Where it was practicable to observe the law strictly, it was observed but without favorable result. For instance, after the Clydach Vale explosion it was found that the haulage roads had been saturated with water, yet it had not exercised any controlling influence on the explosion.

The use of water sprays, dampening and steam, however, has been continued on the American continent until the present day, and has been considered the preferable method of preventing explosions. The Castlegate disaster awakened the mining public to a sense of the inability of water alone as a cure. The Utah Commission advocated the use of local watering with stone dust, distributed in the roadways and airways of the mine.

Engineers are now firmly of opinion that if the new regulations requiring rock dust are enforced with the use of only permitted explosives and electric

safety lamps, the recent explosions in coal mines will not recur, and thus my long effort to point out the uselessness of water as a preventive of colliery explosions, which commence about the year 1902 in *Mines and Minerals*, when H. H. Stoek was editor, has now found its reward and recognition.

JAMES ASHWORTH.

St. Augustine, Fla.

#### Longwall Perhaps but Why Day Men with Picks?

In answering the question of West Virginia operator in the issue of *Coal Age*, July 3, Mr. Barlow suggests that the soft slate be cut out by day-wage men and by picks. I wonder why he suggests this work should be done by hand? If it can be cut by picks it surely can be cut by machine and with greater speed. The modern shortwall machine is so arranged that the feed can be adjusted to meet varied cutting conditions.

In many coal fields slaty partings are being cut out. In one mine I recall a 7-in. streak being cut out in that way. After the slaty streak was removed the loader shoveled the slate back into the gob so that the floor was clean when the shot was fired. This slate would loosen from the coal. If the machine did not bring out all its cuttings a long-handled shovel was used to clean up the loose slate. A practically clean coal was produced.

#### DIFFICULT TO GET SUCH MEN

Just imagine hiring day men to put in a cut under a face 100 or 150 ft. wide, with some of the undercut slaty. Few miners would want the job, even if the regular day wage scale were paid for the cutting. A machine would do the work, cheaper, quicker and better. If used, the bottom should be left for a length of two cuts so that the machine could be loaded and unloaded without difficulty. The longwall might work, but the hand picks never.

Where hard labor is required in a standard operation payment should be by the work performed or the work will be done in a dilatory manner. The job of cutting out an undercut on a longwall face is a standard operation of that kind, and the work is hard. It would be a mistake to do it by day men but why do it by hard labor with machines available? Today men insist either in having a machine or powder do the work. Undercutting is nearly a dead art.

J. H. BLAIR.

Moundsville, Pa.

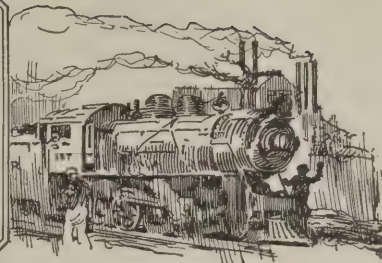
#### Why Glycerine Is Used for Tempering Steel

Glycerine and its water solutions, as well as oil-water emulsions, have been examined by the U. S. Bureau of Standards to find quenching media to span the gap between water and oil. From experimental quenching curves giving the rate of cooling at the center of a 1-in. cylinder of 32 per cent nickel steel, it was found that glycerine-water solutions accomplish this purpose effectively and that, moreover, they have characteristics distinctive from those of oil and apparently in their favor.





# Production And the Market



## Mathematics of Anthracite- and Bituminous-Coal Market Convincing But Demand Is Nil

Coal men have proved to their own satisfaction a hundred times that the contracts must begin soon to roll in. At first they set July as the time, and then August, now it is September, but the buyer has been amazingly reluctant. He listens to no one. He has abounding faith in the power of the mines to produce and in the railroads to haul all the coal he needs when he needs it. And just now he wants to reduce his inventories, so he is waiting. Sales are small and for prompt delivery. But the game of procrastination cannot continue much longer without the consumer being pinched. Even now the railroads are questioning their ability to handle the coal that will be needed just when equipment is in insistent demand.

The undertone of the market is good. In Arkansas the regular retail increase of 50c. a ton was made August 1, despite slack business. One operating company in Utah made a similar increase. In Alabama domestic sizes were raised 20c. a ton. The company and some independent anthracite-producers raised their schedules on an average 10c. a ton. Evidently these increases were anticipatory of a better market, of which at present hardly a shadow can be seen. The mathematics of the market is convincing, but demand is nil.

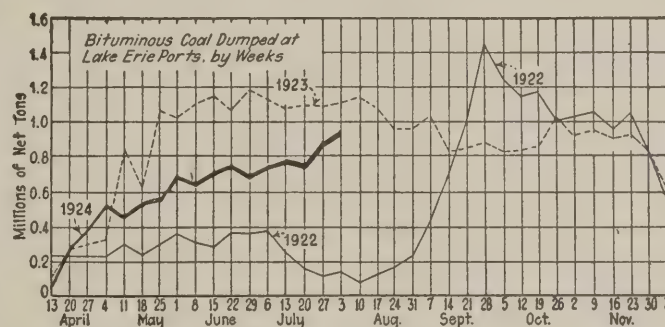
The railroads know the condition better than other consumers. They recognize their inability to meet the situation, but the consideration that has been shown them has convinced them that no matter what happens they will be allowed to take care of themselves. Why should they take a place at the distributing window when they know that they can at any time force their way to the front when the line begins "to form on the right," and so far it has not even begun to form.

Coal Age Index of spot prices of bituminous coal showed no change during the past week, standing on August 4 at 163, the corresponding price being \$1.98.

Hampton Roads dumpings for all accounts during the

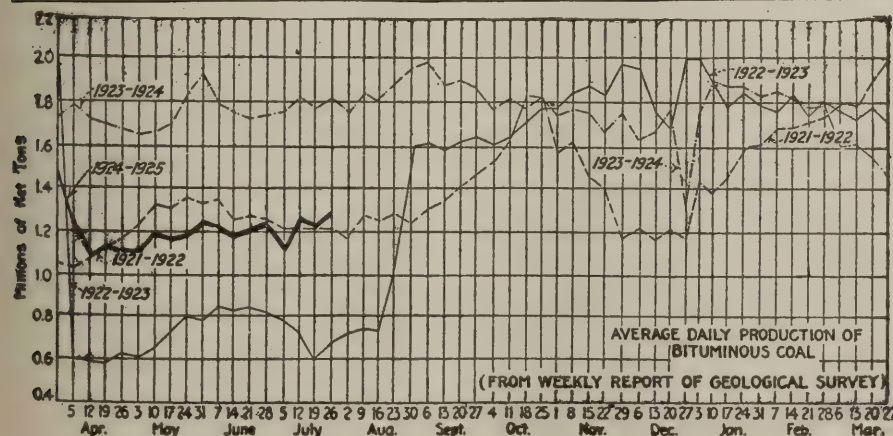
week ended July 31, totaled 352,000 net tons, an increase of 8,940 tons from the week preceding but the tonnage failed to reach that of the week ending July 17, when 373,600 net tons were handled. The movement of coal at the Lakes made a further advance, being for the week ending Aug. 3, according to the Ore and Coal Exchange: For cargo 830,915 net tons and for fuel 44,066 net tons as against totals of 785,317 and 43,443 net tons respectively the week before.

The production of bituminous coal for the fourth week of July improved slightly, the output according to the Geological Survey totalling 7,564,000 tons, an



activity that has not been exceeded since March 29 of this year. The previous week showed an output of 7,401,000, according to the revised figures. Anthracite production decreased, being 1,837,000 net tons in the week ending July 26 and 1,840,000 in the previous week.

Anthracite shows a stagnation closely paralleling that of bituminous. The Canadian retailers have large stocks of it which no one seems anxious to buy. Buffalo is proposing to use bituminous in place of anthracite to heat its public schools. The combined effect of dilatory buying and substitution threatens to put anthracite operation on slow time.



### Estimates of Production

(Net Tons)

#### BITUMINOUS

	1923	1924
July 12.....	10,925,000	7,502,000
July 19.....	10,676,000	(a) 7,401,000
July 26.....	10,817,000	(b) 7,564,000
Daily average.....	1,803,000	1,261,000
Cal. yr. to date (c).....	311,971,000	254,420,000
Daily average to date.....	1,773,000	1,446,000

#### ANTHRACITE

	1923	1924
July 12.....	2,051,000	1,871,000
July 19.....	2,005,000	1,840,000
July 26.....	2,080,000	1,837,000
Cal. yr. to date.....	58,885,000	52,469,000

#### COKE

	1923	1924
July 19.....	361,000	(b) 103,000
July 26.....	363,000	(a) 99,000
Cal. yr. to date (c).....	11,468,000	6,484,000

(a) Revised from last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.



### Midwest Recovers Slowly

It is still difficult for the Midwest coal trade to feel the market rebound. There is a distinct pick-up in inquiry and without doubt buying is getting a little stronger every week, but there is nothing even faintly resembling a rush for any grade of coal. Steam coals from the principal Illinois and Indiana fields are in slightly better demand but that doesn't mean much, for storage piles are still supplying most wants except for those railroads and industrials which made short-time contracts during the summer at ridiculously low prices. Strip pits are busy on steam business. Deep mines must give their coal away to place any tonnage.

Illinois and Indiana mine running time was increased by a narrow percentage during the past week due to the slight domestic betterment. However this very increase had a tendency to further demoralize quotations. It is hard work for the strongest operators to maintain prices in the face of the cutting that goes on regularly.

In the Duquoin and Jackson County fields of Illinois conditions are much the same as in the Cartersville district, with practically nothing doing and no market and no prices. In the Mt. Olive district things are practically at a standstill excepting mines working on contracts and railroad coal.

The Standard district still continues to lag. There is no demand for any kind of coal and all sizes remain on track unbilled. The problem of the future is the steam market. With the mines working scarcely two days a week there is an overproduction of steam sizes. When the domestic demand gets good the disposal of the steam coal will worry the operator.

### Kentucky Feels Encouraged a Little

Louisville coal men report that July business closed somewhat more active than June business. The outlook is more promising, as the demand for domestic sizes is steadier and will improve after the vacation season ends. Utilities and steam consumers also are taking a little more fuel for immediate use and may start stocking a little coal shortly. Railroads also have been placing more coal in storage. Lake movement from eastern Kentucky has been improving a trifle.

Generally speaking utility consumption has been off, as longer days have cut down consumption of current, and some of the smaller industries have been running slow reducing their consumption of power. Street-car companies in some cities have been having light travel and have reduced their running schedules.

### Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern		Market Quoted	Aug. 6 1923	July 21 1924	July 28 1924	Aug. 4 1924†
Smokeless lump.....	Columbus....		\$5.85	\$3.85	\$3.85	<i>\$3.50@</i> \$3.75
Smokeless mine run.....	Columbus....		3.00	2.20	2.10	2.00@ 2.25
Smokeless screenings.....	Columbus....		2.35	1.30	1.30	1.15@ 1.30
Smokeless lump.....	Chicago....		5.75	3.85	3.85	3.75@ 4.00
Smokeless mine run.....	Chicago....		2.75	1.85	1.85	1.75@ 2.00
Smokeless lump.....	Cincinnati....		5.75	3.75	3.85	3.50@ 4.00
Smokeless mine run.....	Cincinnati....		3.25	1.80	1.85	1.75@ 2.00
Smokeless screenings.....	Cincinnati....		2.85	1.35	1.35	1.10@ 1.50
*Smokeless mine run.....	Boston....		5.35	4.30	4.30	4.25@ 4.40
Clearfield mine run.....	Boston....		2.35	1.85	1.85	1.45@ 2.35
Cambria mine run.....	Boston....		3.00	2.15	2.30	2.00@ 2.60
Somerset mine run.....	Boston....		2.60	2.00	2.00	1.75@ 2.40
Pool 1 (Navy Standard).....	New York....		3.25	2.70	2.70	2.50@ 2.90
Pool 1 (Navy Standard).....	Philadelphia....		3.40	2.80	2.80	2.60@ 3.00
Pool 1 (Navy Standard).....	Baltimore....					
Pool 9 (Super. Low Vol.).....	New York....		2.55	2.05	2.05	1.90@ 2.25
Pool 9 (Super. Low Vol.).....	Philadelphia....		2.60	2.15	2.15	1.95@ 2.35
Pool 9 (Super. Low Vol.).....	Baltimore....		2.45	1.90	1.95	1.90@ 2.00
Pool 10 (H.Gr. Low Vol.).....	New York....		2.25	1.80	1.80	1.65@ 2.00
Pool 10 (H.Gr. Low Vol.).....	Philadelphia....		2.25	1.75	1.75	1.65@ 1.90
Pool 10 (H.Gr. Low Vol.).....	Baltimore....		2.25	1.70	1.70	1.65@ 1.75
Pool 11 (Low Vol.).....	New York....		1.80	1.55	1.55	1.35@ 1.70
Pool 11 (Low Vol.).....	Philadelphia....		1.95	1.45	1.45	1.35@ 1.60
Pool 11 (Low Vol.).....	Baltimore....		2.00	1.55	1.55	1.50@ 1.60
High-Volatile, Eastern		Market Quoted	Aug. 6 1923	July 21 1924	July 28 1924	Aug. 4 1924†
Pool 54-64 (Gas and St.).....	New York....		1.80	1.50	1.50	1.35@ 1.65
Pool 54-64 (Gas and St.).....	Philadelphia....		1.80	1.50	1.50	1.40@ 1.60
Pool 54-64 (Gas and St.).....	Baltimore....		1.70	1.45	1.45	1.40@ 1.50
Pittsburgh so'd gas lump.....	Pittsburgh....		2.65	2.40	2.40	2.30@ 2.50
Pittsburgh gas mine run.....	Pittsburgh....			2.10	2.10	2.00@ 2.25
Pittsburgh mine run (St.).....	Pittsburgh....		2.05	1.85	1.85	1.75@ 2.00
Pittsburgh slack (Gas).....	Pittsburgh....		1.55	1.25	1.20	1.25@ 1.40
Kanawha lump.....	Columbus....		5.00	2.10	2.10	2.00@ 2.25
Kanawha mine run.....	Columbus....		1.85	1.45	1.45	1.30@ 1.60
Kanawha screenings.....	Columbus....		1.05	1.00	1.10	1.00@ 1.15
W. Va. lump.....	Cincinnati....		3.10	2.10	2.10	2.00@ 2.50
W. Va. gas mine run.....	Cincinnati....		1.60	1.35	1.40	1.25@ 1.50
W. Va. steam mine run.....	Cincinnati....		1.60	1.35	1.40	1.25@ 1.50
W. Va. screenings.....	Cincinnati....		1.05	.95	.85	.75@ 1.10
Hocking lump.....	Columbus....		2.75	2.45	2.45	2.25@ 2.65
Hocking mine run.....	Columbus....		1.85	1.70	1.70	1.45@ 1.65
Hocking screenings.....	Columbus....		1.10	1.15	1.15	1.00@ 1.15
Pitts. No. 8 lump.....	Cleveland....		2.55	2.40	2.40	2.00@ 2.85
Pitts. No. 8 mine run.....	Cleveland....		1.90	1.80	1.35	1.80@ 1.90
Pitts. No. 8 screenings.....	Cleveland....		1.25	1.00	1.05	1.00@ 1.25
Midwest		Market Quoted	Aug. 6 1923	July 21 1924	July 28 1924	Aug. 4 1924†
Franklin, Ill. lump.....	Chicago....		\$3.65	\$2.85	\$2.85	<i>\$2.75@</i> \$3.00
Franklin, Ill. mine run.....	Chicago....		2.85	2.35	2.35	2.25@ 2.50
Franklin, Ill. screenings.....	Chicago....		1.65	1.70	1.70	1.60@ 1.80
Central, Ill. lump.....	Chicago....		2.60	2.50	2.50	2.50
Central, Ill. mine run.....	Chicago....		2.10	2.10	2.10	2.00@ 2.25
Central, Ill. screenings.....	Chicago....		1.35	1.60	1.60	1.60@ 1.65
Ind. 4th Vein lump.....	Chicago....		3.35	2.60	2.60	2.50@ 2.75
Ind. 4th Vein mine run.....	Chicago....		2.60	2.35	2.35	2.25@ 2.50
Ind. 4th Vein screenings.....	Chicago....		1.60	1.70	1.70	1.60@ 1.80
Ind. 5th Vein lump.....	Chicago....		2.85	2.35	2.35	2.25@ 2.50
Ind. 5th Vein mine run.....	Chicago....		2.10	2.10	2.10	2.00@ 2.25
Ind. 5th Vein screenings.....	Chicago....		1.45	1.55	1.55	1.50@ 1.65
Mt. Olive lump.....	St. Louis....		3.00	2.85	2.85	2.75@ 3.00
Mt. Olive mine run.....	St. Louis....		2.00	2.50	2.50	2.50
Mt. Olive screenings.....	St. Louis....		1.50	2.00	2.00	2.00
Standard lump.....	St. Louis....		2.30	2.15	2.15	2.00@ 2.35
Standard mine run.....	St. Louis....		1.85	1.80	1.80	1.75@ 1.85
Standard screenings.....	St. Louis....		1.05	1.45	1.45	1.15@ 1.25
West Ky. lump.....	Louisville....		2.25	2.10	2.10	2.00@ 2.25
West Ky. mine run.....	Louisville....		1.60	1.60	1.60	1.40@ 1.65
West Ky. screenings.....	Louisville....		1.05	1.25	1.15	1.10@ 1.25
West Ky. lump.....	Chicago....		2.10	2.05	2.05	1.90@ 2.25
West Ky. mine run.....	Chicago....		1.30	1.60	1.60	1.50@ 1.75
South and Southwest		Market Quoted	Aug. 6 1923	July 21 1924	July 28 1924	Aug. 4 1924†
Big Seam lump.....	Birmingham..		3.50	3.20	3.20	3.30@ 3.50
Big Seam mine run.....	Birmingham..		2.00	1.75	1.75	1.50@ 2.00
Big Seam (washed).....	Birmingham..		2.35	2.00	2.00	1.75@ 2.25
S. E. Ky. lump.....	Chicago....		3.10	2.10	2.10	2.00@ 2.25
S. E. Ky. mine run.....	Chicago....		1.85	1.50	1.50	1.25@ 1.75
S. E. Ky. lump.....	Louisville....		2.85	2.10	2.10	2.00@ 2.25
S. E. Ky. mine run.....	Louisville....		1.75	1.55	1.55	1.35@ 1.75
S. E. Ky. screenings.....	Louisville....		1.00	.95	.95	.85@ 1.10
S. E. Ky. lump.....	Cincinnati....		3.10	2.50	2.25	2.00@ 2.75
S. E. Ky. mine run.....	Cincinnati....		1.55	1.45	1.50	1.25@ 1.65
S. E. Ky. screenings.....	Cincinnati....		.90	.90	.90	.75@ 1.10
Kansas lump.....	Kansas City..		4.00	4.50	4.50	4.50
Kansas mine run.....	Kansas City..		3.25	3.50	3.50	3.50
Kansas screenings.....	Kansas City..		2.60	2.50	2.00	2.50

\* Gross tons, f.o.b. vessel, Hampton Roads.

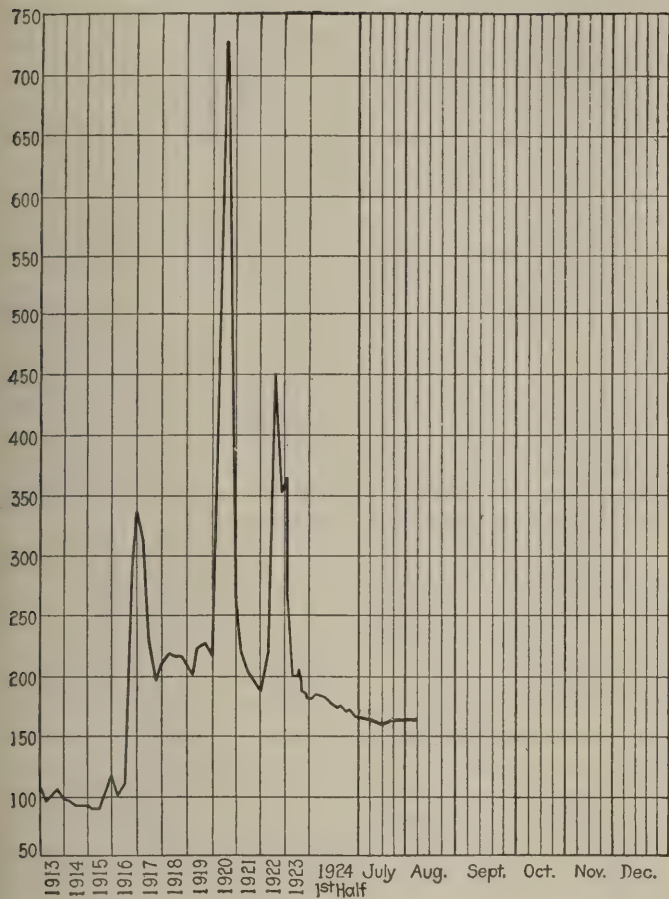
† Advances over previous week shown in heavy type, declines in italics.

### Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

		Market Quoted	Freight Rates	Aug. 6, 1923		July 28, 1924		Aug. 4, 1924†	
				Independent	Company	Independent	Company	Independent	Company
Broken.....	New York....		\$2.34		\$7.75@ \$8.35		\$8.00@ \$8.95		\$8.00@ \$9.05
Broken.....	Philadelphia....		2.39		7.90@ 8.10		8.80@ 8.95		8.90@ 9.05
Egg.....	New York....		2.34		8.50@ \$12.75		\$8.50@ \$8.75		8.65@ 9.05
Egg.....	Philadelphia....		2.39		9.25@ 11.00		8.90@ 9.60		9.00@ 9.05
Egg.....	Chicago*.....		5.06		8.50@ 12.00		7.25@ 7.45		8.02@ 8.12
Stove.....	New York....		2.34		8.50@ 13.00		8.00@ 8.35		8.65@ 9.30
Stove.....	Philadelphia....		2.39		9.25@ 11.00		8.15@ 8.35		9.05@ 9.10
Stove.....	Chicago*.....		5.06		8.50@ 12.00		7.25@ 7.45		8.30@ 8.45
Chestnut.....	New York....		2.34		8.50@ 12.75		8.00@ 8.35		8.65@ 9.05
Chestnut.....	Philadelphia....		2.39		9.25@ 11.00		8.15@ 8.35		9.00@ 9.05
Chestnut.....	Chicago*.....		5.06		8.50@ 12.00		7.25@ 7.45		8.24@ 8.38
Range.....	New York....		2.34			8.30	8.18@ 8.24		8.24@ 8.38
Pea.....	New York....		2.22		6.75@ 8.00		8.80		8.90
Pea.....	Philadelphia....		2.14		7.00@ 7.50		6.00@ 6.30		5.50@ 6.00
Pea.....	Chicago*.....		4.79		6.15@ 6.20		5.75@ 6.25		5.75@ 6.00
Buckwheat No. 1.....	New York....		2.22		7.00@ 8.50		5.30@ 5.65		5.36@ 5.91
Buckwheat No. 1.....	Philadelphia....		2.22		3.00@ 3.50		3.50@ 4.15		3.00@ 3.15
Rice.....	New York....		2.22		2.75@ 3.50		3.50		3.00
Rice.....	Philadelphia....		2.22		2.25@ 2.50		2.50		2.00@ 2.25
Rice.....	Chicago*.....		2.14		1.75@ 2.50		2.50		2.25
Barley.....	New York....		2.22		1.25@ 1.50		1.50		1.50
Barley.....	Philadelphia....		2.14		1.15@ 1.50		1.50		1.50
Birdseye.....	New York....		2.22		1.25@ 1.60		1.60		1.60

\* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.





Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

	1924			1923
	Aug. 4	July 28	July 21	Aug. 6
Index .....	163	163	163	195
Weighted average price .....	\$1.98	\$1.98	\$1.98	\$2.36

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board.

Prices continue steady on all sizes and grades, even screenings holding firmly, whereas it had been expected that some breaks would show, as a result of the Lake movement of prepared coal and increased general movement of domestic sizes. Collections are a little slow but somewhat better than they were.

Production in western Kentucky shows small increase, a few of the mines that were strike-bound having resumed operation under non-union agreements, and the demand for coal having slightly increased. However, there has been some slight trouble reported around the non-union mines, where radicals have been endeavoring to scare off negro and other labor, through intimidation. Recent visits of International President John L. Lewis and of miners from Indiana and Illinois, have put fresh "pep" into the radicals of western Kentucky.

The district, is stirred up, and production of the non-union mines cannot be heavy under such conditions. Prices are firm, with the exception of mine run, which has been showing a slight weakness.

### Northwest Buys Slowly

Movement to the docks from lower lake ports continues to improve, and forty-one cargoes were landed last week of which seven were hard coal. There are twenty-four cargoes on the way of which eight are reported as anthracite. It looks as if the docks will get as much as they want before freeze up, although an early winter is predicted.

Present indications are that the docks will take practically the same quantity of coal as last year—that is

1,400,000 tons of anthracite and nine or ten million tons of soft coal. This will supply the needs of the northwest. The difficulty will be to find storage for the coal, as the docks are well crowded at present for this time of year, and the buying movement has not as yet materialized.

Extreme dullness still pervades the Milwaukee coal market. Dealers in the interior are beginning to evince some interest in future supplies, and there is a dribble of deliveries to private consumers, but the volume of the sales is small. Anthracite was advanced 10c. per ton on Aug. 1, but prices of other grades of coal remain unchanged. Arrivals of coal by Lake are quite brisk, but receipts are far behind those of last year. Coal receipts of anthracite to date aggregate 386,538 tons, and the soft coal 960,708 tons. Last year at this time the record was 444,572 tons of anthracite, and 1,509,946 tons of soft coal.

### West Feels Temporary Flurry

Little summer storage has been reported through the Southwest. The advances of 50c. in the retail price of Arkansas semi-anthracite July 1 and Aug. 1 stimulated the demand from householders a few days before the announced increases became effective, with a corresponding increase of mail orders for operators and jobbers. But the market quickly returned to virtually its former monotonous level.

Arkansas semi-anthracite lump is now listed at \$6@\$7 a ton; semi-anthracite mine run, \$3.50@\$4; screenings, \$2. No change has yet been made in the price of Kansas coal, although one is imminent. Kansas lump still is quoted at \$4.50, nut at \$4, mine run at \$3.50 and screenings at \$2.50. Henryetta (Okla.) coal is quoted at \$4.50 for lump, \$4 for nut, \$3.25@\$3.50 for mine run and \$2 for screenings.

A slight stimulation was noted in the Colorado coal market during the week inasmuch as the average working time of the mines picked up to 20 hours. This, however, is still far from encouraging but the operators expect to be fairly busy as soon as the farmers begin to realize from their crops. Prices remain unchanged.

Business in Utah is brisk. Storage orders are coming in in good volume since the increase in prices a few weeks ago. Lump is in greatest demand, but other sizes also are selling. Production is up to a little more than 40 per cent now and increasing. One operating company raised its prices 50c. a ton on Aug. 1, and a general increase is expected not later than Sept. 1.

### Cincinnati Seents Better Trade

More optimism but no advances in price summarizes market conditions in Cincinnati during the week past. Better inquiry from domestic coal buyers in Indiana and northern Ohio has followed the rise in the price of grains. Lake buyers are now nearly 4,000,000 tons short of the normal movement. These two factors soon must move this sluggish market to action. Nevertheless the mines are loading less coal than usual as car records prove.

There is a wide divergence between the asked and sales prices. Steam slack and mine run seem to have reached rock bottom. They surely cannot be pounded below 75c. and \$1.25 respectively. On the other hand the positions of egg and 2-in. coal have been slightly bettered, the latter being the preferred size for heavy lake shipments. A number of the dealers and direct mine representatives here are turning down business where deliveries a month hence are specified. This is taken to indicate that they have high hopes of a betterment in price. Collections are slow.

While trade in Columbus is still dull, signs of improvement are discernible. Buying on the part of dealers has increased slightly and there also is a better steam trade. Consumers, however, continue to play a waiting game. Retail prices are fairly steady at the levels which have prevailed for some time. Utilities are buying fairly well, but owing to unsettled industrial conditions, consumption is not at a high point. Boards of education are asking for bids on school coal and some municipalities also are looking around. Lake trade is steady and the congestion of cars between Columbus and Toledo has been relieved. Bottoms are more plentiful.

The output in the eastern Ohio field for the week ended July 26 is approximately the same as that of the preceding week. Operators and jobbers say that more inquiries are being received. The increased production is attributable to a general demand for steam coal. One or two steel com-



panies in this vicinity having placed good-sized orders for fuel. Spot quotations on slack and nut and slack have stiffened 5 to 15c. per ton. This is due, largely, to the stronger demand for this auxiliary steam fuel and its reduction in quantity. Less fuel is being loaded for the lakes so less slack remains to be disposed of.

Coal production in the Pittsburgh district has increased slightly in the past two or three weeks, but one searches the market in vain for evidences of any concurrent increase in sales activity. There is no demand in the district for lake coal.

Trade at Buffalo is light and promises to remain so awhile. Consumers have on the average six weeks' supply and demand will be light till conditions change.

Midsummer dullness still prevails in the Toronto market. The yards are well stocked, with shipments coming forward in moderate quantities.

### New England Market Sluggish

In New England the trade shows almost no change. Both all rail and by water the tone is extremely sluggish, and aside from scattering purchases for relatively small tonnages there is little doing in any direction. Neither in textiles nor in shoes is there any optimism over the near future, and under such conditions buyers are not likely to be much interested. Reserves of coal are reasonably large, and at the present rate of consumption it will be months before they are depleted.

Receipts by water have somewhat increased during the past week, but this is more an indication of oversupply than any favorable turn to the market. The result is a depression in prices to a point below any of the quotations of two to three months ago. Few factors now pretend to get more than \$4.25 per gross ton f.o.b. vessel at Hampton Roads, or \$5.50 on cars at Boston or Providence. There are active rumors that sales have been made under these levels, but they are not easy to verify.

All rail from central Pennsylvania there is no better outlook than a month ago. The lower range of prices on Pocahontas and New River tends naturally to restrict the area open to deliveries all rail, and even on the quality coals the tonnage moved is very light.

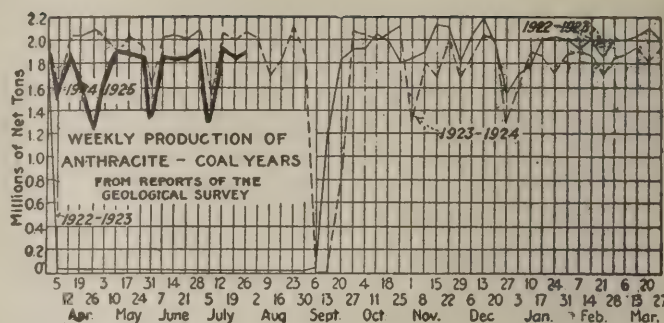
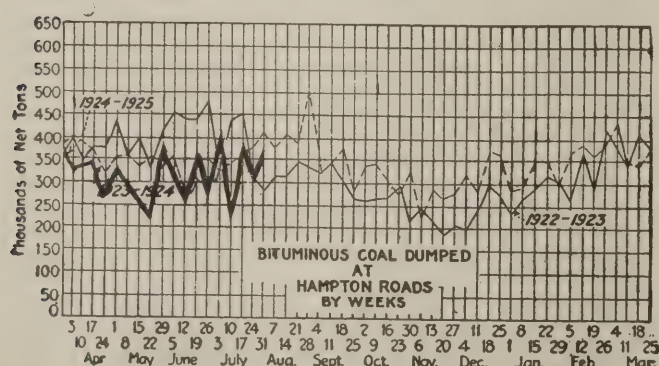
At the Philadelphia and New York piers the dumpings continue very small and confined to specialties. Gas-producing coal seems to be moving in fair volume, but this is staple business and is applied on contracts that call for somewhat heavier shipments at this time of year in order to begin accumulation for the winter.

### Atlantic Seaboard Dull but Hopeful

Little life is visible in the New York market. Nevertheless there are indications that the slump has about reached its end. A slightly better tone is evident, although it has not taken the form of new orders, consumers continuing to depend on reserve stocks. Receipts at the tide water piers were smaller last week, averaging between 1,200 and 1,300 cars daily. This, however, was more than sufficient to take care of current business, and bargain hunters frequently were able to get cheap cargoes.

Nothing in the Philadelphia bituminous trade encourages the belief that a better demand for coal is in sight. There is, however, growing evidence of greater industrial activity. Plants which had been working on short time are adding more hours to their week but the railroads will not buy.

The Baltimore market is dull indeed. Demand is lacking



and that is the whole story. The railroads are urging that coal be laid in now as cars and locomotives will be needed later for transportation of grain, but since the excitement of war days, when men did many things simply because they were told it was good for the country to do it, there has been a reversal of form, and even intelligent propaganda that is backed by the soundest of good sense has lost a large part of its force.

Some Birmingham interests report that there is a better undertone in the market, but no actual improvement is claimed in either inquiry or business booked. Trade is still dependent on scattering orders for small tonnage and prompt shipment. Consumers have scarcely any stocks, and they do not seem to want any. Domestic sales are at a low ebb. The retail trade is slack and contract deliveries are held up almost entirely.

### Anthracite Demand Shrinks Further

Less demand and a slight cut in quotations for many of the independent domestic coals featured the hard-coal market at New York last week. The large companies, including some of the biggest independent operators, advanced mine-price schedules for domestic coals on an average of about 10c. per ton. Stove continues to be the most sought size and commands a premium over the other sizes when taken separately. There is a fair demand for egg and chestnut, with the former a little stronger and quotations higher than for chestnut. Forced sales of chestnut bring less than current quotations. Considerable pea coal is reported in storage, quotations for the independent product going as low as \$4, except for the best grades. Steam sizes are moving under pressure. There is considerable storing in progress and many retail yards are filled to the limit.

In Philadelphia, August is living up to expectations. Retailing is extremely sluggish. It is difficult to see, how suspension of mining can be avoided. The company operators probably will store the surplus, if any, in their big yards, but this the independents cannot do.

Producers seem to have confidence that they will get through August without extraordinary difficulty, as evidenced by the fact that most of them have added 10c. a ton to their prices. Some did not increase nut, and others let stove stay, but all in some way made increases. This is true both of companies and independents. Baltimore dealers have considerable stocks on hand.

The Connellsville coke market, taken as a whole, is very quiet. Furnace coke is practically stagnant, and there is scarcely any buying in smelter coke. In heating coke and in foundry coke there is a moderate movement. Furnace coke is steady at \$3. Good-grade medium-sulphur coke is \$2.75 to \$2.85, with ordinary heating coke at \$2.60 to \$2.75, and first drawings sometimes going down to \$2.50. Foundry coke has been gradually softening for several weeks and is now definitely quotable down 25c., at a range of \$4. to \$4.50. Occasionally \$4.75 is obtained on small lots for choice brands. In the Birmingham district another furnace stack has been laid idle during the past week. Foundry coke quotations range from \$4.50 to \$5.50 per ton at ovens.

### Car Loadings, Surpluses and Shortages

	Cars Loaded	
	All Cars	Coal Cars
Week ended July 19, 1924.....	930,284	145,986
Previous week.....	910,415	146,177
Week ended July 19, 1923.....	1,029,429	190,826
	Surplus Cars	
	All Cars	Coal Cars
July 22, 1924.....	344,892	158,606
Previous week.....	355,720	169,697
July 21, 1923.....	79,710	5,167
Car Shortage		
.....	7,891	3,676



## Foreign Market And Export News

### British Market Weak Save for Best Steams; German Competition Reappears

There is practically no change to record in the Welsh coal market. Best steam coals are going a little better, but there is a considerable surplus of all other kinds. Inquiry from Europe is poor, and considerable competition is being experienced from Germany now that the Ruhr collieries are again in working order. Many of the collieries are working short time and several more of the older pits have been closed down. Miners are now offering to work on a piecework basis in some collieries to prevent shutting down. There is occasional acceptance of these offers by producers. Some operators are making heavy cuts to effect clearances, and buyers are fairly successful in "bearing" prices.

There is no improvement in the Newcastle market and German competition is playing its part here also. The domestic and industrial markets have declined a little owing to the recent spell of very warm weather and the general slackness of trade. There are no contracts to report.

Production by British collieries during the week ended July 19, according to a cable to *Coal Age*, totaled 4,904,000 tons, compared with 5,002,000 tons during the week ended July 12.

#### Hampton Roads Trade Picks Up; Prices Stiffening

Business is showing a tendency to pick up at Hampton Roads, with prospect of substantial increase around the middle or latter part of August. Dumpings for July at the piers kept well up to the average, though they were slightly below the record for the corresponding month of last year.

The tone of the market is slightly stronger, with reports of activity in the textile fields in this territory soon to bring a bigger demand.

Some distress coal is being bought in small cargoes at prices well below the market, but prices generally are stiffening.

#### Destination of Coal Exports from United States During June

	1923	1924
Anthracite.....	418,594	349,134
Bituminous.....	2,418,769	1,513,899
Exported to:		
France.....	135,849	65,615
Italy.....	116,529	71,848
Netherlands.....	24,766	.....
Other Europe.....	116,447	3,943
Canada.....	1,822,996	1,186,172
Panama.....	.....	19,312
Mexico.....	11,560	7,212
Br. West Indies.....	17,815	9,938
Cuba.....	39,929	27,356
Other West Indies.....	21,987	22,167
Argentina.....	11,632	5,059
Brazil.....	54,818	66,078
Chile.....	7,468	11,229
French Africa.....	27,778	.....
Other countries.....	9,195	17,970
Coke.....	63,841	48,238

#### United States Imports of Coal During June

	1923	1924
Anthracite.....	5,716	4,490
Bituminous.....	45,320	31,200
Imported from:		
United Kingdom.....	10,287	.....
Canada.....	35,113	15,113
Japan.....	.....	9,500
Australia.....	.....	6,587
Coke.....	8,779	2,771

#### Demand for Industrial Coal Shrinks in French Market

Inquiry for industrial coals in the French market has shrunk and stocks are increasing. The household coal situation is favorable, except for bituminous coals and ovoids. Disposal of industrial grades in the East and Lorraine regions is difficult owing to the stocks accumulated at the end of winter in the fear of British and German strikes and increased since by the Sarre mines through liquidation of their formidable arrears in deliveries during the winter.

In the Ruhr, coal and coke have been lowered 20 per cent in price. Nevertheless indemnity fuels are actually dearer than Belgian, British and French coals.

The Belgian market is quite weak in industrial coals and stocks at the mines

are accumulating as arrivals from the Ruhr increase. On the other hand, as the French Government is about to suppress fuel export permits, a recrudescence of French competition is expected, notably in the regions of Borinage and Tournaisis.

During the first fifteen days of July the O.R.C.A. was supplied with 218,992 tons of coke, or a daily average of 14,600 tons.

#### Export Clearances, Week Ended Aug. 2, 1924

##### FROM HAMPTON ROADS

	Tons
For Brazil:	
Br. Str. Nilemade for Rio de Janeiro.	5,648
Br. Str. Homer City for Rio de Janeiro	6,752
Br. Str. Barbacena for Pernambuco..	5,490
For Chile:	
Br. Str. Ascot for San Antonio.....	92
Br. Str. Mount Berwyn for Antofagasta .....	3,863
For Porto Rico:	
Nor. Str. Cissy for Guayabal.....	3,000
For Uruguay:	
Br. Str. Dumfries for Montevideo....	5,011
For Germany:	
Ger. Str. Hannover for Hamburg....	5,987
For France:	
Nor. Str. Hektor for Marseilles.....	7,190
For West Indies:	
Nor. Str. Jacob Christensen for Fort de France .....	5,475
For Malta:	
Ital. Str. Lucia .....	3,660
For Panama:	
Nor. Str. Fram for Guanico.....	3,921
For .....	
Br. Str. Bata Secondee .....	1,009

##### FROM BALTIMORE

For France:	
Belg. Str. Carlier .....	10,009
For Porto Rico:	
Am. Str. Delfina .....	30

##### FROM PHILADELPHIA

For Cuba:	
Nor. Str. Gunny for Havana .....	—

#### Hampton Roads Pier Situation

	July 24	July 31
N. & W. Piers, Lamberts Pt.:		
Cars on hand.....	1,228	1,812
Tons on hand.....	73,424	107,606
Tons dumped for week.....	124,979	107,939
Tonnage waiting.....	5,000	5,000
Virginian Piers, Sewalls Pt.:		
Cars on hand.....	1,516	1,296
Tons on hand.....	107,100	90,950
Tons dumped for week.....	75,513	106,858
Tonnage waiting.....	2,500	5,111
C. & O. Piers, Newport News:		
Cars on hand.....	1,947	1,928
Tons on hand.....	97,353	77,884
Tons dumped for week.....	105,811	108,415
Tonnage waiting.....	7,430	11,330

#### Pier and Bunker Prices, Gross Tons

##### PIERS

	July 26	Aug. 2†
Pool 9, New York....	\$4.75@ \$5.00	\$4.75@ \$5.00
Pool 10, New York....	4.50@ 4.75	4.50@ 4.75
Pool 11, New York....	4.25@ 4.50	4.25@ 4.50
Pool 9, Philadelphia..	4.70@ 5.00	4.70@ 5.00
Pool 10, Philadelphia..	4.45@ 4.70	4.45@ 4.70
Pool 11, Philadelphia..	4.30@ 4.50	4.30@ 4.50
Pool 1, Hamp. Roads..	4.20@ 4.25	4.15
Pool 2, Hamp. Roads..	4.10@ 4.15	4.05
Pools 5-6-7 Hamp. Rds	4.00	4.00

##### BUNKERS

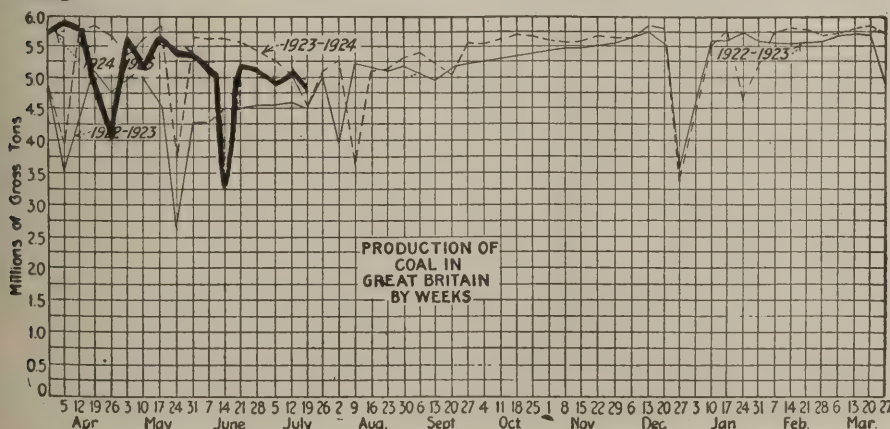
Pool 9, New York....	5.00@ 5.25	5.00@ 5.25
Pool 10, New York....	4.75@ 5.00	4.75@ 5.00
Pool 11, New York....	4.50@ 4.75	4.50@ 4.75
Pool 9, Philadelphia..	5.00@ 5.30	5.00@ 5.30
Pool 10, Philadelphia..	4.75@ 4.95	4.75@ 4.95
Pool 11, Philadelphia..	4.50@ 4.70	4.50@ 4.70
Pool 1, Hamp. Roads..	4.20@ 4.25	4.20
Pool 2, Hamp. Roads..	4.10@ 4.15	4.10
Pools 5-6-7 Hamp. Rds	4.00	4.00

#### Current Quotations British Coal f.o.b. Port, Gross Tons

##### Quotations by Cable to Coal Age

	July 26	Aug. 2†
Admiralty, large..	28s. @ 28s. 6d.	28s. @ 29s.
Steam smalls....	16s. 6d. @ 17s.	16s. 6d.
Newcastle:		
Best steams.....	20s. 6d. @ 21s.	20s. 3d. @ 20s. 6d.
Best gas.....	21s. 6d. @ 22s. 6d.	22s. 6d.
Best bunkers.....	21s. @ 21s. 6d.	20s.

† Advances over previous week shown in heavy type, declines in italics.







## News Items From Field and Trade



### ALABAMA

The Corona Coal Co., of Corona, is reported to be preparing to open a mine at Mount Valley that will necessitate some railroad building.

### COLORADO

The Moffatt Coal Co. is reported making preparations to open the Elkhead mine, an anthracite property on Cottonwood Creek, near Steamboat Springs.

The Colorado Fuel & Iron Co. reports a deficit of \$27,304 for the quarter ended June 30, after all charges and reserves, compared with a surplus of \$498,057, or \$1.34 per share earned on the common stock outstanding, in the corresponding quarter last year. The gross receipts for the three months totaled \$10,851,978, as against \$12,103,515 for the June, 1923, quarter.

During the month of June Colorado mines produced 565,336 tons of coal. This is a decrease of 191,221 tons as compared with the corresponding month last year. The total number of men employed in and about the mines that month was 12,417. In addition to this being a decrease under 1923 it also is the lowest June production reported since 1909 with the exception of 1921, when 547,473 tons was produced.

### ILLINOIS

Two more coal mining companies in the Peoria field have dissolved. They are the Clarke Coal & Coke Co., of which Horace Clarke was president, and the Logal Coal Co., of which W. R. Coleman was the head.

The "Never Seen" coal mine, at Matherville, which was closed following the death in the mine of George Bugos, its owner, has been reopened and put in operation.

The strike of mining machine men in Orient No. 2 mine at West Frankfort continues with no sign of a break in spite of the fact that the state union officials including Vice-President Harry Fishwick, declare the men have no case. The strike started when the new \$10.07 day wage for loading machine runners was supposed to take effect July 16. No coal has been mined in Orient No. 2 since.

Joe M. Cravens, who owns a slope mine six miles south of Herrin, was found dead with his son Claude at the bottom of the slope on July 23. It is believed they were asphyxiated, possibly by gas fumes from a gasoline engine, which they had entered to inspect.

The younger Cravens had been married three weeks and was on a visit at Herrin from his home in Freeburg.

The Mars, a large lake collier, has delivered 7,000 tons of Fairmont (W. Va.) coal at the Hussey docks, Waukegan. This is the second coal boat of the season to dock at Waukegan, the first one having brought 8,000 tons of anthracite.

The Brewerton Coal Co. announced it would reopen its mine No. 3, at Lincoln, Aug. 1. Clean-up work was started July 28. The mine was closed for the last four months. A force of 250 men will be employed. Mine No. 2 of this company, also located at Lincoln, has been operating most of the time this summer.

No definite settlement has ever been made of the affairs of the defunct Southern Gem Coal Co., which last winter failed to pay off employees at more than seven mines in southern Illinois. Receiver W. S. Wilson denies recent reports that Mine No. 1, at West Frankfort, is to soon reopen and that the Peabody Coal Co. had bought the "West" mine at West Frankfort, and would soon reopen it.

A building and loan association has been organized at Mason, the new mining town which has been laid out by the Illinois Coal Corporation. The town is located 11 miles from Mt. Vernon. The object of the association will be to assist miners and others to erect or to buy their own homes. There are now 250 houses in the town and it is hoped that one hundred more will be erected this fall. H. D. Fischer is president of the association and C. E. Anderson secretary.

The St. Louis Coke & Iron Co. will soon move its main offices from St. Louis to Chicago, according to an announcement of Wm. C. Maguire, president. The company, which is a \$20,000,000 corporation, has its main plants at Granite City, Ill., near St. Louis, and cokes southern Illinois coal almost exclusively. The offices in Chicago probably will be located in the Continental and Commercial National Bank Bldg., where a branch office has been maintained in the past, and the former main office in the Planters' Building, St. Louis, will be made into a branch office only.

George B. Spitler, Mt. Zion, acting for a committee of the stockholders of the Lovington Coal Mining Co., Lovington, has bid in the property at bankruptcy sale for \$5,000. Included in the property are fourteen acres of land and about four thousand acres of lease-

holds. The buildings of the mine are valued at between \$40,000 and \$50,000. Several claims have been filed against the property, most of which are payrolls, which will have to be adjudicated. The amount of these claims is uncertain. With the passing of the mining property of the pool of old stockholders represented by Mr. Spitler, a new corporation will be formed at once, with capital of \$100,000, and steps will be taken immediately to put the mine in operation for hoisting coal for the fall trade. The mine has a rich vein of coal from 7 to 9 ft. thick. The monthly payroll under normal conditions is about \$30,000 and from 200 to 250 men are employed.

### INDIANA

The Indiana Coal Merchants Service Bureau, of Indianapolis, has changed its principal place of business to Anderson.

The Big Ben Coal Co. of Center Point has changed its name to the Big Ben Coal & Clay Co.

### KANSAS

District 14, United Mine Workers, recently levied its first assessment against the miners who worked the first half of June, for the benefit of those who have been unemployed during the summer. Some 2,000 men, members of forty-one locals, were said by union officials to be eligible to assistance.

### KENTUCKY

It is reported that coal traffic on the Ohio River has been materially curtailed as a result of a considerable amount of river equipment going aground, principally above Cincinnati, as a result of government engineers having raised dam wickets at points around Wheeling and Pittsburg, resulting in the lower river dropping 10 ft.

### MASSACHUSETTS

The Philadelphia & Reading Coal & Iron Co.'s lease of the Mystic Wharf coal pier of the Boston & Maine R.R., at Boston, is being terminated as of Sept. 1, a contract having been let to G. P. Carver, coal-plant engineer, to remove the superstructure of the wharf for the P. & R. It has been rumored that H. N. Hartwell & Son were to take over the plant for receiving anthracite, but confirmation of the report is lacking. The plant measures 435x125 ft., has two large discharging towers and other equipment in proportion. The



P. & R. at one time stored 35,000 tons at this wharf.

## MISSOURI

A new and larger shovel will be installed before autumn by the Liberal Coal & Mining Co., which has been operating a strip mine near Liberal for two years.

## OHIO

The Clay County Coal Co., with operations at Hima, Ky., has purchased the Buchanan interests in the Furnace Gap Coal Co.'s properties and those of the Morning Glow Mining Co., all of which will be consolidated under the one management. The Clay County Coal Co. is made up largely of those associated with the Kentucky Fuel Co., of Cincinnati, of which John Hoffman and L. F. Norning are the directing heads.

The Brady-Tucker Coal Co., with offices in the Dixie Terminal, in Cincinnati, has liquidated as of Aug. 1. Heavy losses sustained through the failure of an Indiana wholesale company are given as the cause of the determination to quit business. Larry Tucker, moving spirit in the corporation since the death of Jake Brady, will devote all of his time to the management of his father-in-law's estate. J. C. Shelly will carry over the live accounts until further arrangements to this end have been completed.

## PENNSYLVANIA

Governor Gifford Pinchot has appointed John F. Bevan, of Pottsville, as a member of the Anthracite Mine Inspectors' Examining Board.

Work on the construction of a large reservoir capable of holding approximately 2,000,000 gallons of water, has been started by the Glen Alden Coal Co. at its Taylor breaker. The reservoir is to be utilized in an effort to decrease the amount of water used in the preparation of coal, by using the same water several times. Timothy Burke, Scranton contractor, is working on the project.

The Cayuga tower, coal pockets and engine house, located in North Scranton and owned by the Glen Alden Coal Co., are soon to give way to more modern mining methods. The equipment has lain idle for many months, the fresh-mined coal being handled through nearby, more modernly equipped coal preparing plants. Morris Sullivan, of Bellevue, one of the best-known contractors in the anthracite field, has been given the contract to raze the Cayuga workings. It was Mr. Sullivan who tore down the old Bellevue breaker, now the site of the Baker breaker; the Dodge breaker; the Sloan breaker, the Hampton tower and other buildings discarded by the Glen Alden company in its advance toward greater efficiency.

A committee on mining methods, machinery and power, of the Central Pennsylvania Coal Producers' Association, composed of William Wetter (chairman), Richard Peale, L. W. Householder, E. K. Davis and Andrew B. Crichton, met in the association

rooms in Altoona recently and recommended a detailed study by the association of special machinery for loading coal and laying track.

The Schuylkill Valley Coal Co. an operation near Port Carbon, in which ex-Governor Sproul is interested, is to resume soon. The mine was closed because of the default of payment of bills and has been idle for several months, but Judge Koch, of Pottsville, has entered a decree of foreclosure in favor of the bondholders, who will operate the plant again.

James Boyle, of Freeland, has leased the old Harleigh culm and debris banks of the former Madera, Hill &



Alfred Kauffmann

Newly elected president of the Link-Belt Co. under the recent scheme of reorganization. Mr. Kauffmann was named to succeed Charles Piez and, with Mr. Piez, is a member of a newly created executive committee of four members. Before his accession to the presidency Mr. Kauffmann was second vice-president of the company.

Co.'s Black Creek Coal Co. workings on the west side of the Harleigh road. The workings are now part of the operations of the Jeddo-Highland Coal Co.

Announcement is made by the officials of the Lehigh Coal & Navigation Co., that Edward Hughes, of Philadelphia, has been named controller of that concern to succeed E. M. Reynolds, deceased. Mr. Hughes, who formerly held the position of purchasing agent, is succeeded by J. R. Bennington, his assistant. F. T. Swain has been appointed assistant purchasing agent.

Mrs. Julia Sarasin, of Dupont, Pa., has tied up the Volpe colliery. Mrs. Sarasin recently purchased five lots extending 250 ft. along a main street in Dupont and including a roadway to the Volpe colliery, the only entrance. She immediately had her land fenced, which blocked the roadway. The company protested and Mrs. Sarasin suggested she would let coal trucks cross her property at the rate of \$1 each. The company is now in court seeking an injunction against the woman realtor.

Two more big strippings are to be started in Schuylkill County. One will be at Buck Run, where work has

already begun on the opening of the veins on the north side of the mountain near the Crystal Water Co.'s dam at Rohresville. Many thousands of tons of coal are expected to be removed. The Philadelphia & Reading Coal & Iron Co. is getting ready to strip on a large scale and the largest shovel ever seen in the section is being taken up the side of the Broad, or Gordon Mountain, above Heckscherville. Another shovel is expected to be placed in service at Pine Knot soon.

The mines of the Argyle Coal Co., located at Gallitzin, after being idle for three weeks, resumed operations on July 23. This concern supplies fuel to the Pennsylvania R.R. at a coaling station for engines on the Pittsburgh division.

The Lehigh division of the Lehigh Valley Coal Co., held first-aid team contests at Hazleton last week for the first time in several years, the Oneida No. 3 team winning first place. Fourteen teams took part. The Hazleton division contest was held later. A cup is contested for by the various divisions.

The River Pollution Committee of Reading has a report on the possibility of cleansing the Schuylkill River, which is little more than a sulphur creek all the way from Shamoking to Norristown due to the many mines and washeries draining into it. The committee has received authoritative data declaring that the river can be cleaned of pollution in five years if proper measures are taken and the authorities enforce them.

Central Pennsylvania coal operators are deeply interested in a hearing being conducted by the Public Service Commission in Harrisburg on the complaint of the Rainey-Wood Coke Co., which is seeking proportional freight rates on inbound bituminous coal from the Connelville field and outbound byproducts from its Swedeland plant, near Philadelphia. The gist of the request is that the rate on coal for use in byproducts be reduced about 32c. below the rate on coal for other uses. Beehive coal producers and the railroads are opposing the rate reduction. The hearing promises to be long drawn out.

On July 26 a fall of rock in the main heading of the Lamont mine of the H. C. Frick Coke Co. near Uniontown fell on the main trip as it was passing, injuring more or less seriously thirteen employees, two of whom sustained broken backs.

Every employed mine worker in District 1, United Mine Workers, must pay an assessment of 25c. a month for the support of the unemployed miners of the district as a result of a decision reached by the members of the district executive board. The assessment is effective immediately and will be continued until further notice.

A syndicate headed by McLaughlin, MacAfee & Co., of Pittsburgh, and Schibener, Boenning & Co., of Philadelphia, is offering an issue of \$1,250,000 Shamokin Coal Co. first mortgage 6½ per cent sinking-fund gold bonds, due Aug. 1, 1944, at 100 and interest, to yield 6.50 per cent. The company owns in fee simple a tract of anthra-



cite located within the borough of Shamokin and Coal township, Northumberland County. Sixteen veins of coal estimated to contain over 24,000,000 tons of virgin anthracite are located within the property. Prominent anthracite operators of New York and Philadelphia are interested in the company.

Five miners from Jerome, Somerset County, were sent to the Western Penitentiary for from 18 months to 10 years, having been convicted of dynamiting the Baltimore & Ohio R.R. bridge leading to the Hillman Coal & Coke Co. mines at Jerome during the 1922 strike in an endeavor to interrupt the operation of these mines.

## WASHINGTON

Local engineers at Bellingham have been making tests between the surface and the interior of the Bellingham mine of a radio communication system which has been worked out by W. A. Germain, a local radio expert. Mr. Germain, recently held an exhibition for the benefit of the Bellingham chapter of the American Association of Engineers.

## WEST VIRGINIA

Designating T. F. Henritze as commissioner in chancery to make an examination of the affairs of the Tarney Collieries Co. and E. C. Bralley as receiver, Judge I. C. Herndon, in the Circuit Court of McDowell County, directed a full accounting of the affairs of the company, following charges of mismanagement and juggling of funds made by George W. Lambert, wealthy coal operator and a large stockholder in the Tarney concern. Mr. Lambert asserts that he has been unable to find out just what the assets of the company are and that recently a number of judgments aggregating a large amount have been awarded against the collieries company.

The Island Creek Coal Co. reports total net profit of \$1,436,874 for the six months ended June 30, 1924, against \$1,361,230 in the corresponding period last year. After common and preferred dividends the company reported a surplus for the half year of \$574,488, against \$23,653 in 1923. The net profits for the first half of 1924, after allowing for the dividends on the preferred stock, were equal to \$10.83 a share on the 118,801 shares of common stock outstanding, against \$10.20 a share in the corresponding period last year. The net profit for the June quarter totaled \$438,643, or \$3.07 a share on the common as compared with net profit of \$622,954, or \$4.72 a share reported for the same quarter in 1923. The company produced 2,050,907 tons of coal in the six months ended June 30, 1924, against 1,278,818 tons produced in the first half of 1923.

The Tidewater Coal Inspection Bureau has been opened at Norfolk in charge of H. B. Tarrant, chief inspector, for the purpose of sampling coal in yards, cars and cargoes. Mr. Tarrant, who has been engaged in similar work at Norfolk for several years, formerly was with the U. S. Fuel

Administration. A new method of handling coal at the piers to decrease the percentage of slack and dust is being demonstrated by M. Tarrant, who asserts that he can practically guarantee 10 per cent more lump in cargoes.

## CANADA

The Toronto Wholesale Coal Dealers' Association has been adding a number of new members lately, and is arranging to resume its luncheon meetings.

Output of bituminous coal in Alberta for the first five months of 1924 was 1,133,568 tons as against 1,576,046 tons



Charles Piez

As the result of a reorganization of the administrative force of the Link-Belt Co., Mr. Piez has retired as president of the company and has been elected chairman of the board. He also has been named as chairman of a newly created executive committee of four members, who will act in an advisory capacity. He held the office of president of the organization for eighteen years and has been succeeded by Alfred Kauffmann.

for the same months of the previous year. Sub-bituminous coal production was 409,330 tons for the 1924 period as against 244,561 tons during the early part of 1923.

Production of coal in British Columbia for the month of June shows an improvement. The mines on Vancouver Island now are working almost full time. Those of the Nicola-Princeton field also are feeling the effects of the improved trade. The Crows Nest Pass Collieries are idle because of the strike.

Roy Wolvin, president of the British Empire Steel Corporation and other officials recently made a visit of inspection to the Picton County plants of the company. After conferring with T. J. Brown, Deputy Minister of Mines, it was decided not to reopen the Allan mine, in which the recent explosion occurred, until at least the end of August.

The Dominion Coal Co. has made a general cut in the pay of all officials, affecting all salaried men from President Wolvin down to the lowest paid clerk. The cut in the pay of the highest salaried officers is 25 per cent, the reduction in the case of the smaller

salaries being 10 per cent, and between the two extremes the reductions are proportionate to the salaries paid.

## New Companies

The Goldville Mining Co., a coal company, has been incorporated in Spiro, Okla., with a capital stock of \$60,000, by R. L. Redwine, J. R. Redwine and J. S. Sorells.

The Old Cato Coal Mining Co. has been incorporated in Henryetta, Okla., with a capital stock of \$25,000, by C. E. Downs and Ben Meyers, both of Los Angeles, Cal., and G. L. Smith, of Henryetta.

The Blue Goose Coal Co. has been incorporated in Knoxville, Tenn., with a capital stock of \$75,000, by C. L. Peterson, L. A. Bible and C. A. Bowen.

A charter has been issued to the Anthracite Fuel Corporation, of Wilkes-Barre, Pa. It has a capital stock of \$15,000, and Ralph P. Thomas, 18 East Pettebone Street, Forty-Fort, is treasurer. The incorporators are: Treasurer Thomas, Walter W. Harris, Scranton, and James P. Harris, Kingston, Pa.

The Normandale Coal Co. has been formed to take over the Normandale property, two miles from Nicola, B. C., on which a 12-ft. seam of good bituminous coal has been opened. The property will be developed under Edward Floyd, managing director of the company, who has had wide experience in the Newcastle fields, England, and the Westville fields, Nova Scotia.

The Dick Coal Co. has been organized to mine coal in Lewis County, West Virginia. The company is capitalized at \$25,000 and will have its principal office at Weston. Interested in the new concern are Charles P. Darlington, J. W. Marsh, J. W. Eakin, J. E. Griffin and P. D. Marsh, all of Weston.

The Alma Pond Creek Coal Co. has been organized to operate in the Thacker field of West Virginia. The company is capitalized at \$150,000. It is to operate near Sprigg, W. Va. Among those active in organizing the new company were H. L. Ducker, R. C. Pforr, P. P. Gibson, D. G. Hughes and M. F. Breslin, all of Huntington, W. Va.

The following bituminous-coal companies were recently incorporated at Harrisburg, Pa.: Viaduct Coal Co., Summerville, Pa.; capital, \$10,000; incorporators, I. W. Carrier, Baxter, treasurer; H. L. Carrier, Summerville, and H. A. Corbett, Summerville. Campudas Coal Co., Carnegie, Pa., capital, \$50,000; incorporators, Charles H. Campman, Seventh St., and Doolittle Avenue, Carnegie, treasurer; John Tudas, Carnegie, and S. E. Wentley, West Elizabeth, beth.

## Publications Received

**Pumps, Centrifugal.** The De Laval Steam Turbine Co., of Trenton, N. J., has just issued a new booklet on single-stage and multi-stage centrifugal pumps. This booklet covers manufacturing methods and materials, testing, and pump details. Other sections are devoted to speed reducing gears, drives, pump applications, characteristics and engineering data.

**Efficiencies in the Use of Bituminous Coking Coal as Water-Gas Generator Fuel.** by W. W. Odell, Bureau of Mines, Washington, D. C. Technical Paper 274. Pp. 39; 6x9 in.; illustrated. This paper is one of a series of publications dealing with an investigation relating to the manufacture of water gas. This investigation was conducted under a co-operative agreement between the Bureau of Mines, Department of the Interior, State Geological Division of Illinois and the Engineering Experiment Station of the University of Illinois.

**Shape Book** (9th edition), published by the Carnegie Steel Co., is now off the press and available to users of steel. The new edition is the result of a thorough check and revision of all the sections rolled by Carnegie Steel Co. on its shape, rail, bar and plate mills, and though no important changes have been made in the regular sizes of structural and bar-mill sizes of beams, channels, angles, tees and zees, a number have been made in the large number of special sections rolled by that company, such as concrete reinforcement bars, window and casement sections, automobile rim sections and other miscellaneous bar-mill sections.



## Traffic News

### Roads May Appeal to High Court Against Indiana Rate Cut

As a result of the ruling of Federal Judge Alschuler, with that of Judges Wilkerson and Carpenter, of Chicago, in denying an injunction to the Baltimore & Ohio and other railroads which sought to restrain the Indiana Public Service Commission from reducing coal freight rates within the State of Indiana, the roads may appeal their case to the Supreme Court, according to unofficial statements of officials of the coal-carrying roads of Indiana.

The ruling of the federal court means that beginning Aug. 1, coal shipped from Indiana mines to points within the state will benefit by a carrier rate from 5 to 28c. lower.

The railroad companies sought to obtain a temporary restraining order pending a decision of the Indiana Supreme Court on a permanent injunction.

### Producers Prepare to Fight Lower Rates Into Indiana

Indiana coal operators are preparing for their fight against reduction of freight rates on coal from Ohio, West Virginia and Kentucky fields to points in Indiana. This follows the filing of the petition by R. B. Capstick, traffic manager of the Indiana State Chamber of Commerce, with the Interstate Commerce Commission against 56 railroads, comprising the Central Freight Association. At the same time the Chamber of Commerce of Terre Haute sent a protest against the state chamber explaining that such a petition was unfair because it would hurt not only Terre Haute but all parts of the state in which coal mining was a main industry.

The hearing on the petition will be held in Indianapolis early in September.

### Commerce Commission to Expedite Lake Cargo Coal Case

In an effort to expedite the Lake cargo coal case, the abstracts of evidence are to be filed Aug. 18, in advance of the argumental portion of the briefs, which are to be in the hands of the Interstate Commerce Commission Sept. 15. Since the chances are that there will be exceptions to the tentative report, time must be allowed for final oral argument. It is known that the commission is anxious to render its decision as early as possible so as not to delay negotiations for coal to move by way of the lakes on the opening of navigation next spring.

### Coal-Rate Hearings Announced

The Coal, Coke & Iron Ore Committee, Central Freight Association Territory, will hold a hearing in Room 606, Chamber of Commerce Building, Pittsburgh, Pa., Thursday, Aug. 14, at 10 a.m., daylight saving time, on a proposal to change the rate on bituminous coal, carloads, to 76c. per net ton from Coaldale Mine and Mineral Siding on the B. & O. R.R. in the Cambridge

(Ohio) district to the following stations in Ohio: Lore City, Cambridge, Cassell, New Concord, Sundale, Bridgeville and Sonora. At the time the rate, of which the present 68c. rate is the outgrowth, was first established to Cambridge, there were no mines on the Baltimore & Ohio in the Cambridge district west of Cambridge, and it was the intention to limit the reduced rate to mines between Lore City and Cambridge. Through oversight when mines were opened west of Cambridge, the reduced basis was extended to all main-line mines in the Cambridge district. It is desired now to correct this situation.

A hearing also will be held at the same time and place on the following proposed change in the rate on coke, except byproduct coke, carloads, from ovens in Chesapeake & Ohio Ry. districts to Niagara Falls, Ont.: Rate of \$5.01 per net ton to be cancelled, leaving through rates to be made on the sums of locals via Detroit. This is proposed to meet the demand of Canadian lines for cancellation of all joint through rates on coke from United States points to destinations in Canada that represent the through charge less than that available, under the combination of local or proportional rates, and from the national boundary via which handled.

Proposed increases in the rates on coal in carload lots from certain stations in Oklahoma to various Southwestern States have been ordered suspended by the Interstate Commerce Commission until Nov. 25.

## Obituary

John H. Dunlap, secretary of the American Society of Civil Engineers, died July 29 as a result of injuries received in a railroad wreck a month ago, when he was returning with some other engineering professors from the meeting of the Society for the Promotion of Engineering Education at Boulder, Col. President McNair of the Michigan School of Mines and Professor Ives of Ohio State University, also were killed in this wreck.

## Coming Meetings

**Rocky Mountain Coal Mining Institute.** Summer meeting, Aug. 7-9, Rock Springs, Wyo. Secretary, Benedict Shubart, 521 Boston Bldg., Denver, Colo.

**New York State Coal Merchants Association, Inc.** 14th annual convention, Sept. 4-6, Stamford-in-the-Catskills, N. Y.; headquarters, Churchill Hall. Executive secretary, G. W. F. Woodside, Arkay Building, Albany, N. Y.

**American Chemical Society.** Fall convention Sept. 8-11, 1924, at Ithaca, N. Y. Secretary Gas and Fuel Section, O. O. Malleis, the Koppers Co., Pittsburgh, Pa.

**Oklahoma Coal Operators' Association.** Annual meeting Sept. 11, 1924, McAlester, Okla. Secretary, A. C. Casey, McAlester, Okla.

**Association of Iron and Steel Electrical Engineers.** Annual meeting and exposition at Duquesne Garden, Pittsburgh, Pa., Sept. 15-20. Secretary, John F. Kelly, 1007 Empire Bldg., Pittsburgh, Pa.

**National Safety Council.** Thirteenth annual safety congress Sept. 29 to Oct. 3, Louisville, Ky. Managing director and secretary, W. H. Cameron, 168 No. Michigan Ave., Chicago, Ill.

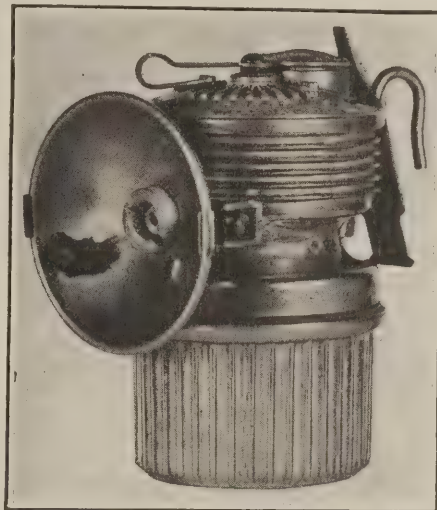
**American Institute of Mining and Metallurgical Engineers.** Fall meeting, Birmingham, Ala., Oct. 13-15. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

**American Institute of Electrical Engineers.** Fall convention, Pasadena, Calif., Oct. 13-17. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

## New Equipment

### Miner's Lamp Made of Aluminum

A new acetylene miner's lamp is made of cast aluminum, with walls  $\frac{1}{8}$  in. thick and seamless. The water tank and carbide cup are ribbed, as may be seen in the accompanying illustration. This feature adds strength and permits a firm grip for unscrewing the cup. Construction is simple and



### Of Light Weight But Durable

Corrugations in carbide and water container stiffen these parts and make both stronger than the nature of the metal would suggest.

the lamp can be taken completely apart and put together again in a few minutes. Every part in it is replaceable. In spite of its solid metal walls and great strength, it weighs less than brass lamps of the same size. The new lamp is made by the Fred R. Belt Co., Inc., 355-361 W. Ontario St., Chicago, Ill. It is named the "Lu-mi-num" lamp.

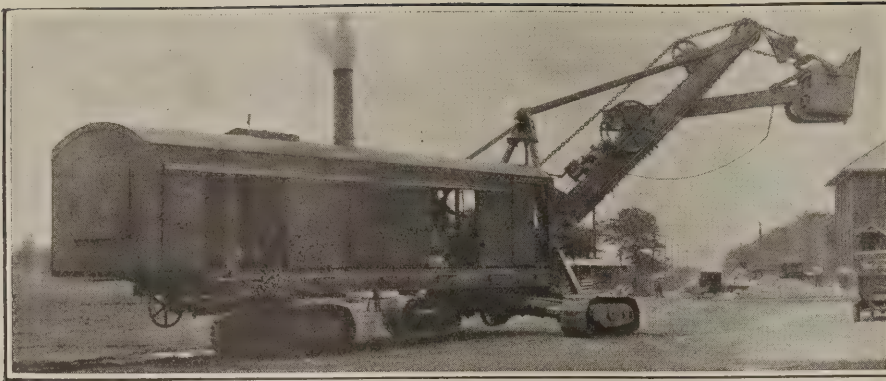
### Continuous-Tread Shovel Has Broad Operating Base

Continuous tread equipment has been adapted by the Osgood Co., Marion, Ohio, to its standard shovels, supplementing the railroad truck and traction mountings. Continuous-tread mountings which are made for shovels of dipper capacities ranging from 1½ to 6-cu.yd., can be easily put on in the field to replace other mountings and are readily removed when it is necessary to ship the shovel by rail.

With the new continuous-tread mounting the track and accessories are eliminated and the pit crew dispensed with or greatly reduced; the shovel can be kept in the most effective digging position, can back away from blasting and can travel and work in water; and the location of the shovel can be changed in minimum time.

These results are obtainable with either heavy traction or continuous-tread mounting. The main difference in





### Continuous Tread Shovel

For relatively soft ground. To steer the shovel a transverse screw with a traveling nut slews the rear truck. The screw is operated by a small engine near the boiler firebox.

the two is in the nature of the ground that each can negotiate. The traction wheels are most successful on hard bottoms, have greater simplicity and are lower in cost. The continuous-tread mounting, at somewhat greater cost, enables the shovel to travel and work on a comparatively broken, faulted and moderately soft surface.

### BELT TREADS REPLACE SIDE JACKS

The mounting consists of two continuous-tread belt units carried on side brackets, replacing the jack arms at the forward end of the machine, and a narrow, double-belt truck occupying the same position as the rear railroad truck. The side brackets are somewhat similar in shape to the jack arms used with the railroad mounting and occupy the same position but are much heavier. They are rigidly attached and braced.

The front tread-belt units are mounted on journals at the outer ends of the jack arms and can rock to accommodate themselves to uneven ground surfaces. The rear truck furnishes a third point of support for the shovel and has a universal action so as to rest firmly on uneven surfaces. To steer the shovel the rear truck is slewed by means of a transverse screw shaft carrying a traveling nut.

The shovel is propelled through the front units only or through both front and rear trucks by power derived from the hoisting engines. The tractive effort is suitably increased by a series of heavy cast-steel spur gears with teeth cut from the solid. These gears with their shafts are assembled in a sub-frame which can be put on or removed as a unit.

### PROVISIONS MADE FOR ROCKING

From the ends of the forward shaft in the sub-frame the power is continued out to each front unit by a universal jointed propeller shaft. As the continuous-tread units are free to rock, these shafts must be provided with means to enable them to work at varying angles.

Power for steering is provided by a small double reversible engine mounted on the deck beside the boiler firebox. The drive from engine to steering screw is direct and without shafts, bevel gears or clutches. The spread of the mounting at the front is approximately the same as the jack screw spread on the railroad mounting. This, with the weight of the forward units, makes the shovel stable under all conditions.

## Light Electric Hoists Pull Cars and Scrape Coal

Single-drum and double-drum electric portable hoists have been designed by the Sullivan Machinery Co. and are now in successful use in different parts of the country.

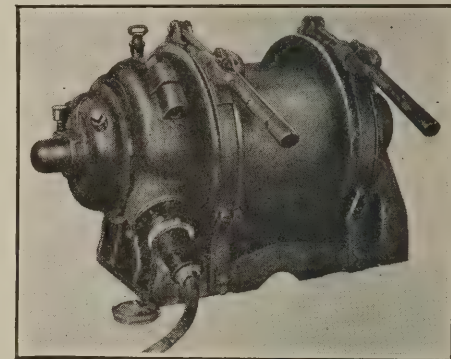
As in the air hoist, the motor of the electric machine is contained entirely within the drum, a fact which makes for compactness, simplicity and ease of handling.

In the single-drum hoist, the motor is supported at one end of the frame or base, and supplies power, through reduction gears to the hoisting drum, which is of 11½ in. diameter and 8¼ in. long. This relatively large drum diameter reduces strain and wear on the hoisting rope, which is a ⅝-in. wire cable. The drum holds 500 ft. of rope.

The horsepower and rating of the hoists are similar to those of the compressed-air machine, namely: 6½ hp. with a capacity of 2,000 lb. dead load vertically, at a speed of 110 ft. per minute on single lines. When hauling cars, for example, on moderate grades

or on the level, the pulling power is much greater. The accompanying curve sheet shows the ability of the hoist in this direction, and applies to both the single- and double-drum machines.

For example, the Steubenville Coal & Mining Co., Steubenville, Ohio, which is using one of the single-drum hoists to pull trips of loaded cars into the bottom as a relief measure for the haulage motor, reports that trips of forty cars with a gross weight of 96,000 lb. are handled satisfactorily. The grade averaged about 1½ per cent and was on a slight curve. In this case the hoist was bolted to timbers between the tracks, but the location or position of the hoist has no effect on its operation. It may be mounted on a crossbar or column in a shaft handling timbers; bolted to a timber or a girder, or to a tree, or to a wall or floor, for pulling cars, piling timber, or odd jobs of



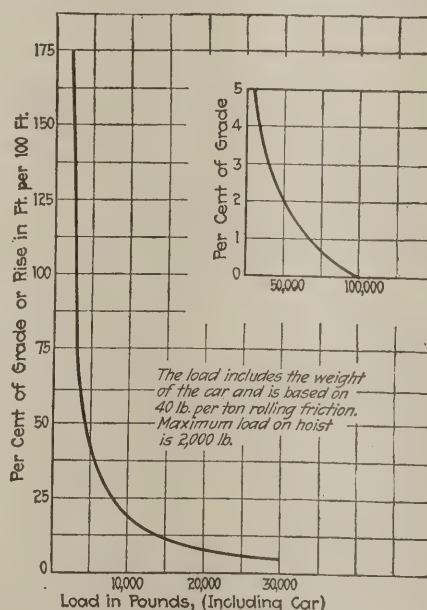
### Single-Drum Hoist for Pulling in One Direction Only

Used at Steubenville to pull trips of forty loaded cars weighing 48 tons into shaft bottom.

hoisting and hauling. The single-drum hoist weighs 480 lb. The double-drum can be used also for pulling a coal scraper instead of a hoist on a foundation. This machine weighs 770 lb., is 38 in. long by 15 in. wide, and stands 19 in. high.

In the double-drum-hoist the electric motor is mounted between the two drums on a central standard, carrying a pinion at each end of its armature shaft, and thus furnishing power through reduction gears, to the two drums, each of which is 11½ in. in diameter by 6¼ in. in length, with a capacity of 250 ft. each of ⅝ in. wire rope. The right-hand or haulage drum has an operating speed at full load (2,000 lb. vertical lift) of 110 ft. per minute. The gearing of the left hand or tail rope drum provides for 160 ft. per minute for handling the empty scraper.

The 6½-hp. motor, built especially for this hoist draws about 25 amp. when running the hoist at full capacity. It is a compound-wound motor. It is totally inclosed, so that dust and dirt are excluded. The temperature rating is ten minutes full load, with a 55-deg. centigrade rise. The motor will run continuously at no load without overheating. The above ten-minute period, of course, is longer than any during which the hoist will be called upon to deliver its full-load rating under any ordinary conditions. This machine is constructed with compound windings.



### Capacity of Single- or Double-Drum Hoist

For heavy inclinations use the larger, lower, left-hand graph. For lighter grades use the graph in the upper right-hand corner. Thus the hoist will pull 20 tons on a level track.



# COAL AGE

McGraw-Hill Company, Inc.  
James H. McGraw, *President*  
E. J. Mehren, *Vice-President*

Devoted to the Operating, Technical and Business  
Problems of the Coal-Mining Industry

R. Dawson Hall  
*Engineering Editor*

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Number 7

## Wanted: A Leader

**C**ONSUMERS are in great need of safe leadership, some outstanding coal purchaser who by his timely purchases and abstentions from the market will prevent hit-and-miss buying. The railroad companies now are the real leaders. When the Pennsylvania R.R. starts to buy and stock coal the word goes around and industry buys. But the leadership of the railroads is not safe. It is liable to bring industry into trouble. The railroads have power to get coal and get it at a low price which is not vouchsafed to the ordinary buyer. The purchasing agent of the railroad does not need to be so circumspect as he does in other industries. He can afford to wait a little longer.

The United States Steel Corporation might serve as such a leader did it not have its own mines. In consequence of that ownership, its action always is believed to have reference to its own internal policy, its own capacities of production and not to the main problems of a possible general shortage of coal. Many other industries including the railroads have their own mines, so the smaller manufacturer has no leading industry to dictate his policy. Were there such an industrial leader who could appoint agents to ascertain the facts and direct his action, we might find the public better apprized. As it is no one seems able to lead, the Department of Commerce, the U. S. Geological Survey, the members of the defunct U. S. Coal Commission, the American Engineering Council, the National Coal Association or the United Mine Workers of America, because they merely advise, and industry has to expend money when it follows their advice. When a coal consumer buys he puts money back of his judgment. And money talks.

## Rock Dusting

**N**O EXCUSE will serve for those who are found next winter with their mines unprotected by rock dust. Those operators who have mine explosions in the coming cold season will have a difficult time reconciling their consciences and satisfying the mining departments and the public. Coal men are always deprecating the multitude of statutes passed for their direction and admonishment. Here is a chance to prove that the industry follows the higher law and does not wait for legislative action.

The insurance companies are doing their part. What is the industry doing? Certainly not as much as needs to be done and done quickly. When the laws are passed let them come into effect promptly, for rock dusting has been proved almost as cheap as it is efficacious. The improvements in the mines of the Utah Fuel Co. are an instance of aggressive safety work. That company is reported as making every effort to make its ill-fated mine safe both with water as a preventive at the face and rock dust as a localizer of explosions. Its action should be an exemplar to other companies. Attack

explosions at the source and arrange to trap them if all else fails.

More rock-dusting equipment companies should enter the field. The industry needs them, but operators should not forget that equipment is not readily obtainable and so should enter the field early. They should not leave the problem till it is too late to get supplies for the protection of their mines this winter.

Do your Christmas shopping early and prove to your men that you have their safety at heart.

## You'd Be Surprised!

**A** COAL mining man can get pretty much down in the mouth these summer days if he simply sits at home and looks at the "no bills" rusting to the track down by the quiet tippie. But if he were roaming around from Bellingham to Birmingham he wouldn't feel so bad. He would continually stumble upon somebody working out the salvation of the coal industry. He would be surprised and then interested and then enthused over the vast amount of thought and ingenuity that are busily producing new devices and methods for getting out coal cheaply.

It is going on everywhere. Probably no other year in the history of coal mining has been so active in this particular. It is well known that great progress has been made in West Virginia in the loading out of coal by conveyor. Devices for both cutting and loading coal are developing there, thanks to the absence of Mr. Lewis' benign influence. Something has been said about a good many of them. But there are developments elsewhere, too, though the developers of necessity are keeping their lights hid under a bushel. They are not deliberately courting trouble with the union.

It is little known that an immense scraper loader for use on long straight working faces has practically attained success in a western mine. It is less known that a shuttle-loader on wheels is about ready for practical operation. It will journey back and forth along a face delivering coal into a trip at the middle point of its course, thus enabling a few men to get out a big daily tonnage with a remarkably low power consumption. Hardly anybody hears about a new system of mining adapted to a novel type of scraper now getting its finishing touches. Not much is known of several new mine layouts calculated to overcome the obstacles of transportation behind standard loading machines. Yet all these ideas are far beyond the paper-model stage. They are succeeding. And many another idea is obtaining its full measure of success, hidden away in the mines of this country waiting for its time to pop into the light. You'd be surprised!

Despite much stumbling, mechanical loading will be solved for all reasonable conditions. We are well beyond the Kitty Hawk stage of development. Hereafter progress should be rapid. So much cogitating and testing cannot fail of ultimate success.



## What To Do? What To Do?

WHEN it comes right down to it, almost everybody has a direct interest in the welfare of coal. Events in Illinois prove that, these days, when we see the state itself rising in defense of its industry. The butcher, the baker and the candlestick maker in average times can gain great self-satisfaction by rub-a-dubbing in their own little tub about how the "cut-throat" miner and the "baron" operator are scheming to hold up the people. But when an insufferable situation with widespread unemployment, political uneasiness and lack of business in the mines is hung like a stone about the neck of the coal industry, so as to begin to cause distress in the butcher shop, the bakery and the candlestick foundry, then the suffering industry becomes "our industry" and we all rise most indignantly though belatedly to defend it.

In Herrin, down in the heart of the great southern Illinois producing field, there are so many hungry families and unpaid bills that on August 20 a public mass meeting is to be held. The people of Williamson County want to find out exactly what causes this travail and what can be done to relieve it. They propose to have a popular "economic conference"—although they don't call it that—where the best men among miners, operators and business interests will tell their stories. The folks of Herrin are tired of suffering in silence. They want to know just exactly why it is that coal from non-union western Kentucky moves right through their territory bound for market, while their own mines are cold and their men are doing nothing or worse. What they can or will do after they find out, nobody knows. But such a mass meeting never was held before, down there. The very fact of its being called is important.

It is to be hoped, however, that the Herrin men this time keep strictly within the law and refrain, certainly from murder, and even from intimidation. News that they are automobiling into the disorderly territory in Kentucky with automobiles bearing that name of evil connotation "Herrin" would be disturbing were the political control of Kentucky in the hands of men as irresponsible as those in Illinois at the time of the Herrin massacre.

Then, too, here comes the Illinois Commerce Commission. It notes that the Interstate Commerce Commission has raised the freight rates on Illinois coal going into the rich Northwest coal market twenty-eight cents and it formally resolves that this "seriously increases the present depressed condition of the mining industry in Illinois." Then it requests the state attorney general to "take such action, either by injunction or otherwise, as in his judgment may be necessary to adequately protect the interests of the people of Illinois." The new Northwest rates are scheduled for effect September 10 but the sovereign state of Illinois may yet block them, since its commerce commission is taking the field along with nearly a score of lesser organizations.

It is hard to foresee what all this hulabaloo in the interest of coal will do. It certainly ought to help a good many rank and file union miners to realize that with the costs of Illinois coal and of non-union coal where they are, Illinois is pretty sure to go hungry. But the interesting feature of the whole new movement is that an entire state is realizing that the coal industry is not necessarily a thing beyond the gates to be

constantly reviled and spat upon. The state confronts a puzzling situation. The question of the day is: "What to do?"

## Our British Exemplars

GEORGE OTIS SMITH gives us in this issue the high lights of the program of the Liberal party in Great Britain in regard to coal. There are many who believe and still more who fear that we are likely to use the British as our exemplars. We got our union and our pit committee from them. We have followed a long line of their precedents in regard to labor. Let us hope that we shall not get from them that mitigated Bolshevism that the report contains, for in some ways the Sovietism that is unadulterated is better than a Sovietism that is hung around the neck of capital. It is planned in the report that the operators and their employees shall be co-equal directors of industry. The first will be subject to loss of capital and the other subject to nothing, not even worry, for if the enterprise fails they loosen their hold on it and attach their boring tools to another and sink that. The report says that back of every successful co-operative action must be self interest. What interest can there be between those who have all and those who have nothing to lose? But let us take courage. This manifesto on "Coal and Power" has after all only the approval of the Liberal party of Great Britain and we may be able to avoid it despite the readiness with which we take British precedents as our exemplars.

As for its references to the acquirement of coal lands and the leasing to concessionaires, less objection might be taken. Royalties are too high; they might at least be prevented from going higher. Requirements that the concessionaires spend enough to make mines safe, healthful and fit working places do not seem so outrageous. The illustrations we hope to show of the Campine will bear out the advantages of the concession system.

Then there is a further hope. The citizen consumer with his Pecksniffian manner, who has been so disposed to be critical and to wonder why the mine worker was not domiciled in tiled houses with pebble dashed fronts, half-timbered gables and exterior chimneys of the best type, will be given the opportunity to pay in the price of his coal his part toward such a consummation. He will no longer be able to berate. What he demands will be done, and he will pay for it.

We publish E. J. Mehren's reactions on the British situation. He says the British are "complacent." The report Dr. Smith has briefed would suggest that some men in Great Britain are neither complacent nor conservative but have a definite program for dealing with the situation. Alas that it is *such* a program as it is! Nor can we feel moved with admiration and assurance at the British qualities, for a country is as good as its whole people. No one can denationalize the undesirable. The fact is, as Mr. Mehren well says, that only too many in Great Britain are looking to the government and not to frugality and hard work. That statement may not affect all classes, but if it affects a large proportion it is certainly not safe for us to praise the British spirit. Unfortunately, not a few have been disposed to believe in America that our own individualism has of late years lost its sturdy qualities. We, also, desire in a measure a government that will act as lackey to our laziness.





## Strip Mines Full of Pitfalls for the Unwary

Operators Can Easily "Landlock" Shovels Merely by Taking Out All the Coal in the Thoroughcut—Any One of Several Systems Will Prevent Loss of Coal and Useless Yardage

BY GRANT HOLMES  
Danville, Ill.

**H**OW simple a thing is coal stripping—to the uninitiated! The apparent ease with which shallow coal is sometimes uncovered and loaded has baited many a good man into ruin. Therefore, in a time like this, when so many people are going into stripping, including deep-mine operators hard-worn by the gruelling effort to reduce their costs, perhaps it will be helpful to scan the progress of stripping practice and point out some of the pitfalls of the business.

The man making his first venture into stripping ought to be warned against taking all the coal out of his first opening or thoroughcut. A wide bench of coal left in is the one thing that will keep his shovel from getting itself "landlocked" and helpless. He should know how to pile waste banks to protect his boundaries. He should realize the necessity of good tile drainage and of having sufficient pump capacity. He should know the virtues of the several methods of circular and parallel cutting so that he may not lose blocks of his own coal or spend money for unnecessary handling of overburden. Some of these things will be suggested in these pages.

In order to compete with the underground mines, the stripping operator must be able to produce a steady output as cheaply as possible. This fact has placed

stripping on a systematic and commercial basis never before attained. To acquire such conditions, gradual and cautious operations are recommended; the operator cannot expect to make big profits as soon as he commences stripping. The relation between stripping and loading must always be taken into consideration.

### ROBBING THE COAL FACE IS DISASTROUS

Naturally, the fact that without stripping of cover, there can be no coal taken from a strip pit is self evident, but that too much mining will stop the stripping, is not quite as apparent, especially to new operators. The practice of too much mining, more commonly known as "robbing the face," means taking all of the coal out of a cut. When the steam shovel has completed the first or thorough cut, the inexperienced operator proceeds to mine out all coal exposed, at a handsome profit. Each succeeding cut is similarly "robbed." Finally, the steam shovel is stopped by being squeezed between the waste banks and the stripping face, unable to dig any farther.

Each cut has been a virtual thoroughcut, due to "robbing" of the coal. Hence, the shovel has been forced to make immense banks of waste material which occupies at least 25 per cent more space than it filled when in place. Each cut sees the space for waste banks become smaller, without decrease in the cutting until at last the equipment is locked tight, all due to "robbing the face" or neglect of the relation between

NOTE—Headpiece shows a stripping where lack of system has made the entire recovery of the coal difficult if not impossible. Though the surface of the land may be worth nothing, the coal lost by ill-considered stripping reduces appreciably the profit of the undertaking.



stripping and loading. In spite of all advice from old operators and the shovel builders, it seems that many of the beginners must at least try what seems to be most profitable—"robbing the face."

To prevent "landlocking" the shovel, the operator must not expect to make all the money on his coal at once. He should first have a stripping shovel of sufficient size to handle easily the deepest overburden in the field. After making a thoroughcut of maximum width, a strip of coal not over 30 ft. wide may be removed along the edge near the property or crop line leaving from 45 to 60 ft. of coal for a working berm. The shovel then returns making a cut a little less than 30 ft. wide. By maintaining approximately these stripping and mining widths throughout the time of operation, the stripping machine is able to work with ease and speed, placing the waste far enough away to prevent burial of the coal face.

If heavier overburden is reached, the cutting can be narrowed down, as the shovel is operating with the edge of the frame nearest the cutting, in a straight line with the outside edge of the stripping face, thus giving plenty of room for swinging the machine. If a bench or berm of coal is left on which the shovel can stand the success of the enterprise is assured, whereas if this berm is removed, failure is inevitable. The berm should be 45 ft. wide if the coal is strong or 60 ft. if it tends to cave at the edge.

#### IN HAND LOADING LEAVE EIGHT FEET FOR TRACK

Up to 1912 the coal was loaded by hand in all fields, and it is so loaded in some regions especially where bottom is uneven. Fig. 4 shows the most efficient method of hand loading. The stripping shovel operates as near the coal face as possible, enabling the overburden to be dumped far enough away to leave about 8 ft. of space between the face of the coal and the base of the wastebank. The track is laid for the length of the cut in this space. Short spur tracks or sidings are led off the main line to the coal face for loading, thus doing away with track entry cutting which is a heavy expense.

The locomotive engineer places about a dozen empty mine cars on one of these spurs. The coal diggers proceed to load the cars, while on the other spur another dozen of "empties" are being placed. When the first dozen are filled, the miners walk over to the second spur and load the cars there. Meantime, the loads are hauled to the tippie, and more empties placed on the recently vacated siding. This alternate loading on each spur makes a continual flow of coal to the tippie and keeps all hands busy.

As the coal face recedes, the sidings are thrown over

accordingly within shoveling distance. By this time, the shovel has reached the end of the cut; the proper quantity of coal has been mined, making room for the wastebank on the return cut.

In some fields where the coal seam is very irregular, containing many "dips," other methods of loading are adopted. Instead of going to the great expense of maintaining a haulage track on such a bottom, the haulage road is placed on top of the bank near the stripping face. The coal is loaded into boxes or "skips." A locomotive crane operating from "on top" transfers the loaded skips from the pit to flat cars on the haulage track.

On arrival at the tippie, a derrick hoists the boxes up to the receiving hopper. The bottoms of these skips are hinged, enabling the coal to be dumped easily. The biggest disadvantage of this system is the maintenance of two extra machines, the crane and the derrick, besides a locomotive and track. The fact that each skip must be handled six times in one round trip to the tippie, is also against this method.

In 1912 the T. J. Forschner Coal Co. of Linton, Ind., installed a small revolving shovel at its strip mine to load coal. So successful was this machine that now every strip pit where conditions permit, has its coal-loading shovel. These small machines have usually a 26-ft. boom and a specially designed 1½-yd. dipper. Being mounted on traction wheels, no tracks are necessary. An engineer and fireman operate the machine, if it is operated by steam, easily loading 1,000 tons of coal in eight hours.

#### TWO LOCOMOTIVES SHUTTLE CONTINUALLY

Two small locomotives are required to handle the coal without loss of time, for while one is spotting a train of cars for the shovel, the other is hauling loads to the tippie and returning with empties. Either 5- or 15-ton mine cars should be used for steam-shovel loading, those for hand loading holding about three tons.

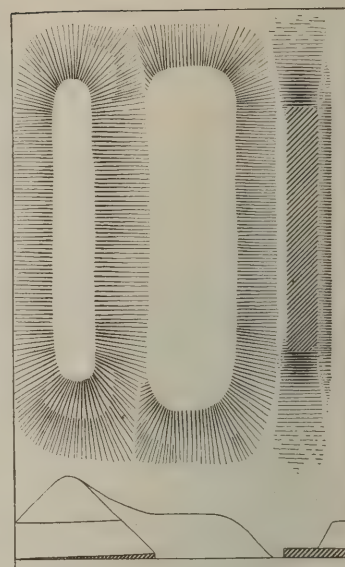


Fig. 1—Stripping by Team and Scraper

Preferable way of handling the stripping of coal with this primitive form of equipment.



FIG. 2  
Hoisting Boxes to Tippie

Scene at Fuller, Kans. Derrick is hoisting 4-ton skip. Plan of handling coal eliminates some construction and haulage problems but is too slow and expensive wherever conditions do not require its adoption.



The track for either hand or mechanical loading should be built of 40- to 50-lb. rails laid on wooden or steel ties without ballast, as the track must be laid anew for every new cut. In some mines where only run-of-mine is sold, railroad gondolas are run directly into the pit and loaded, standard gage track being necessarily used in such cases.

Years ago much prejudice had to be overcome before the machine loading of coal was accepted as practical. The objection was the excessive breaking of coal, but experience shows that only 18 to 20 per cent of slack, results from steam-shovel loading. One seeming disadvantage is the loading of impurities with the coal, but the installation of picking tables on the tipples has largely solved this difficulty.

The track arrangement in the pit for machine loading is different from a hand-loading layout. Figs. 6 and 7 illustrate two possibilities for mechanical coal loading with their accompanying track systems. The stripping shovel must be moved over from the breast until sufficient space is left for haulageway. This brings the base of the waste bank within five feet of the coal face, accommodation for drainage tiles being necessary. The swath of the coal dug out by the shovel is not over 30 ft. wide, depending upon the depth of the overburden and the capacity of the stripper.

In Fig. 6, a common, but not especially desirable condition of operation is shown. The coal shovel is following the big shovel thus depending upon it for each day's output of coal. If the stripping machine should break down, no coal could be produced until repairs were made. Fig. 7 shows a more advantageous situation in which the coal output is not entirely dependent upon the steady work of the big shovel. If the stripping shovel should break down, coal may be loaded until the end of the cut is reached, and by this plan the continuance of stripping depends upon the loading to provide room for a wastebank. The cuts if long enough will provide a steady output while repairs to the big shovel, however extensive, can be made.

While the coal loading was being developed to its present state of perfection, the stripping part of the business kept pace, the important factors in the operation of the large shovels being ascertained. It was

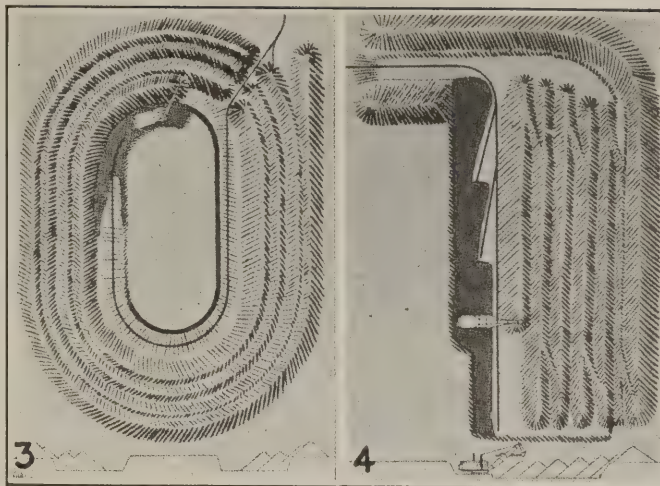


Fig. 3—Circular Plan of Stripping

With this plan, much track-age must be maintained, but this scheme keeps it to a minimum. An entrance is kept open by piling spoil on each side of the entry cut.

Fig. 4—Economical Way of Hand Loading

Stripping shovel operates as near coal face as possible and dumps overburden so as to leave 8-ft. clearance in front of coal face. Spurs make entry cutting unnecessary.

necessary to learn not only how the shovel should be handled but also where the material should be placed.

Of primary importance in the development of steam shoveling has been the creation of a new type of engineers and cranemen to operate these stripping shovels. They differ from the "old timers" by placing the careful handling of the machine above its yardage. The immense size and great weight of the mechanism has made this necessary, especially as 90-ft. booms and 5- to 8-yd. dippers on shovels weighing 300 tons now are not uncommon.

To keep ahead in the stripping work, two shifts of men are required to accomplish what was formerly done in one shift to the great detriment of the shovel. Consistent, steady running has been found the key to successful operation.

The shovel crew consists of four men. The engineer, who controls the hoisting and lowering of the dipper and the swinging of the machine, is the boss; he receives the highest wages, and his judgment and

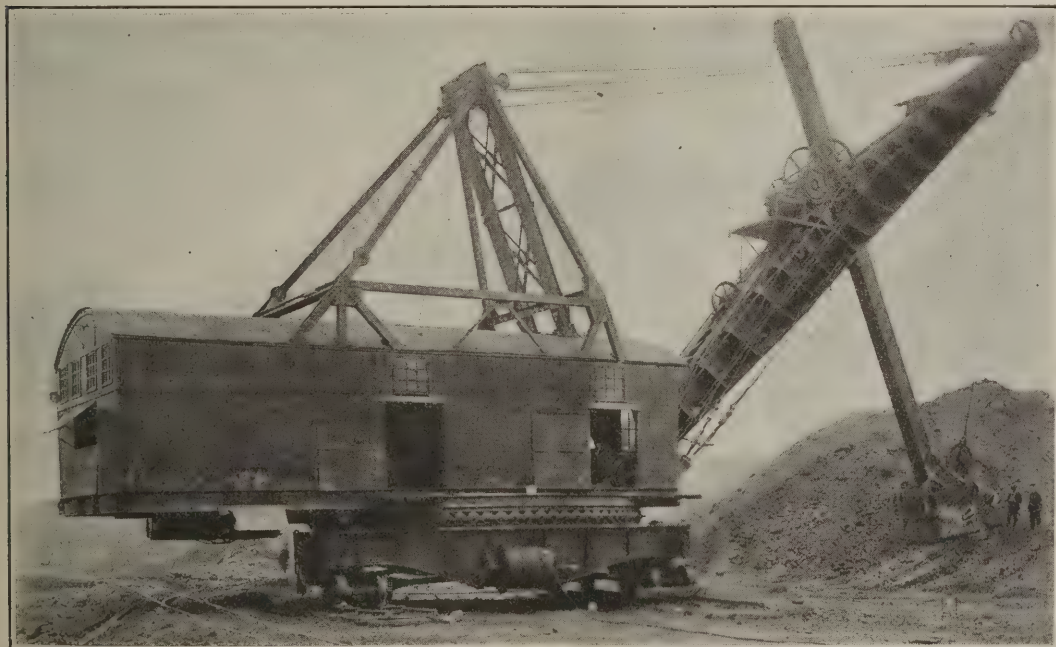


FIG. 5

### Three-Hundred Ton Electric Shovel

Eight-yard dippers and 90-ft. booms make the production of strip coal possible even where overburden is tremendously heavy. The length of boom and size of dipper may be increased in order to make deeper stripping possible, but the conveyor in one form or another may step in to meet this necessity, though the variety of the materials handled and of its condition make the use of the conveyor difficult.



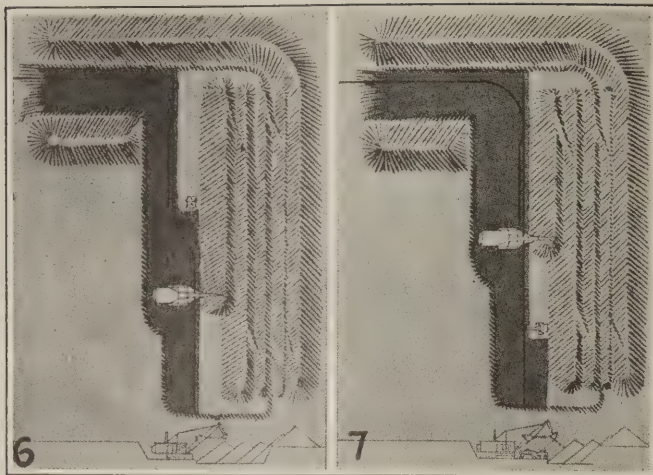


Fig. 6—Common but Undesirable Plan

Here the loading shovel depends for each day's loading upon the stripping shovel. If stripper is delayed loading has to stop. Note that coal is loaded on cars running on track on top of coal.

Fig. 7—Loader Can Work If Stripper Is Idle

More advantageous arrangement than in Fig. 6, but big shovel must depend on loader to make room for waste banks. If cut is long enough loader can work even if stripper is off for extensive repairs.

mechanical knowledge should make him worthy of them, for on him depends the welfare of the entire shovel. The other men have a tendency in their work to follow his example, careless or otherwise.

The craneman who crowds or "eases" the dipper in digging and dumps it, is the right-hand aid of the engineer. Upon their team work, depends the work accomplished by the machine, therefore, they should be as agreeable in personality as possible, each performing his duties in perfect conjunction with the other.

If a steam shovel is used the third man is the fireman. He devotes his entire time to stoking the boilers and maintaining the water supply; his skill and intelligence can prevent many shutdowns from leaking flues. He also should be able to make other boiler repairs.

The fourth member is the oiler who keeps open ears and eyes for squeaks, unusual noises, leaky joints, or dry bearings. Too often managers consider this man

an unnecessary expense. This is a great mistake, for his value is inestimable, in view of the repairs and time losses he can prevent. The oilman takes care of the multitude of oil cups and lubricators, and he has also to watch many minor details of operation. In this way he saves the other members of the crew from being distracted from their work.

Four times each day the entire crew of the well-operated shovel joins in a general cleaning, inspection and oiling. The engineer attends to the hoisting and swinging engines, the craneman to all the boom machinery, the fireman cleans the fires if necessary and examines the water pumps, and the oiler sees that the swinging parts and running gears are supplied with lubricant.

Four other attendants to the shovels are known as "sod-hogs." Their duties are to grade and lay track and to clean up the dirt missed by the dipper.

#### FLOODS KEEP STRIPPING FIRMS BUSY

Some fields are so situated as to be entirely free from floods or an abundance of springs. Many stripping properties opened recently are on high ground but there are many in bottom land where drainage is the principal problem. Much strip coal land seems to be diabolically situated near some river capable of overflowing its banks at the slightest provocation. The usual association of streams and strip coal is due to the fact that the river has at some time previous washed the deep soil from the coal, leaving it suitable for strip mining. Hence, drainage becomes an important but often neglected feature of planning stripping plants.

Of course, the operator cannot tell with much certainty what his water problem will be until the work is progressing, but equipment for any emergency should be on hand. Above all other equipment, electric power should be available, and if central station current cannot be had, no better start for a strip mine can be recommended than the erection of its own power plant.

Several small pumping units and perhaps one large unit are necessary. Each unit consists of a motor and direct-connected centrifugal pump mounted on a truck. Discharge pipes made of spirally wound, galvanized

FIG. 8  
Stripping Takes to Hills

Dump house, incline, monitors, approach trestle, tipple and supply track at mine of Beech Flats Coal Co., Rush Run, Ohio. Hilltop stripping has its advantages in the matter of drainage, for the strip pit is not likely to be inundated by the river, but it often complicates haulage to the tipple. Tipples for handling strip coal are as complete as those for deep-coal preparation.





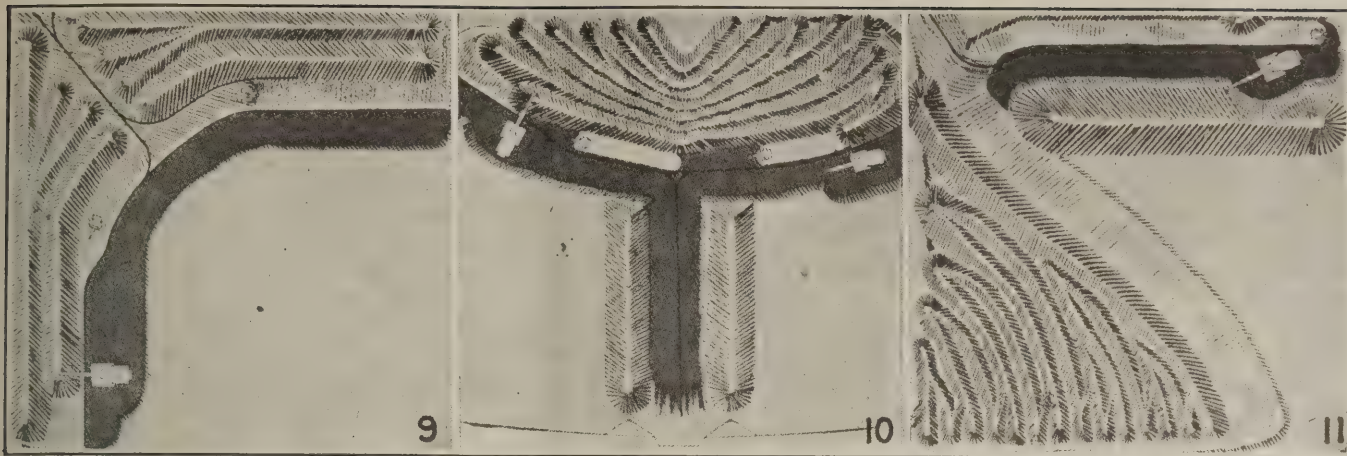


Fig. 9—Rectangular or Two-Pit Method of Stripping

Incidentally this method gives opportunity to protect the edge of the pit against caving, in case it is close to boundary of property. On the thoroughcut, the big shovel deposits waste away from the boundary. Returning to the corner from which it started, it dumps its second cut and about half the waste of the first cut against the boundary. Thus law suits may be avoided.

Fig. 10—Stripping Valley with Two Sets of Equipment

Where the cover is thin in the middle of the property and thick at the sides, the two big shovels first cut down through the middle and then work away from one another. The work constantly retreats toward the tippie as in retreat system of mining, thus steadily shortening haulage with consequent savings. The cutting line is almost straight for both strip shovels.

Fig. 11—If Right-Angle Method Is Unsuitable Try Radial Plan

Where property lines must be preserved, this scheme protects them without leaving a wide strip of coal. Spoil from the thoroughcut along one boundary is piled inside. From the end of this pit the shovel makes alternate short and long cuts, working at an angle of 45 deg. to the property line and dumping back toward it. This fills the stripping face made by the thoroughcut.

iron, connected without the use of unions, are cheap and easily handled.

One of these small units is kept with the coal-loading shovel, which at a short distance behind itself, digs up a small dam between the waste bank and the coal face. The discharge of the pumps is behind this dam, thus keeping the coal pit free from water. If much water comes into the haulage way, a sump is dug at the lowest point, and a large unit installed there permanently, with discharge laid over the wastebank.

#### WET OVERBURDEN AND WASTE WILL SLIDE

Where seepage and springs pour great quantities of water into the cuts, a system of tiling should be laid, if possible. A large main parallel to the cutting is placed in the first cut, below the coal, and openings in this line carry away the water in the first pit. Laterals are attached to this main, laid under the waste-banks as each succeeding cut is made. The openings are located between the foot of the spoil banks and the face of the coal.

Floods are not all the troubles arising from water. The wetness of the overburden is another phase of the drainage problem. If very wet and sloppy, the waste banks will slide down suddenly and unexpectedly, sometimes burying the coal-loading machine or, at least, covering up the coal face. The face of the cutting will also slide down from the undermining effect of springs, perhaps catching the stripping shovel.

Here is where a bed of shale or soapstone above the coal is an advantage, for by leaving in a bench of this material along the stripping face, many slides will be prevented. If that shale or soapstone which must be dug is deposited near the coal face in a small, separate wastebank, and the wet, slippery material dumped behind it, a double-built and double-strength bank results. The burial of the coal face is avoided, as the bank of hard material is a retaining wall for the overburden which would slide down.

Throughout the history of stripping, one of two systems of operation, circular or parallel, has been used with each style of machine, according to its adaptability. The circular system has been proven im-

practical in irregular fields, and wasteful and costly in any field. Therefore, with the building of the modern stripping shovel, parallel cutting came into general use. No one definite method of applying this cutting can be recommended as each field has its own peculiar problems in shape, drainage and depth of overburden. By means of sketches, some of the plans coming to my notice are shown with this article. They will suggest "how to do it" to new operators who may read this.

Figs. 4, 6 and 7 illustrate the methods probably most commonly used and the one applicable to many fields. The thoroughcut is made in the shape of a right angle following the property lines the width and length of the land. The overburden is piled on both sides of this cut. The shovel now uncovers the coal by cuts parallel to the field length, starting with the long part of the initial cut. A haulageway is maintained in the shorter part of the thoroughcut. In hand loading, the coal is mined out of the haulageway, whereas in machine loading it is left in.

#### TAKING OUT BOTH COAL AND FIRECLAY

In some strip mines, the coal bed is immediately above some other valuable material, such as fireclay for brick making. A two-pit arrangement would be desirable in such a case, for loading out both materials.

Fig. 9 illustrates a field opened on a right angle, incorporating the shortest haulageway possible. The sketch also shows another method of handling the thorough cutting to be used when the work is near a property line.

The shovel has started from a corner of a field making the first cut along one side, depositing all waste away from the property boundary. Returning to the corner, the shovel dumps its cutting and about one-half of the thoroughcut wastebank against its boundary. Caving in along this line which might result in heavy lawsuits against the mine owners, is prevented by throwing the overburden in this manner.

Starting from the same corner at right angles to the first cut, the second thoroughcut is made. As the dumping is done mostly at right angles to the digging in the operation of the stripping shovel, a gap has been



left in the spoil banks when the 90-deg. turn is made. This gap will occur the diagonal length of the field, leaving a naturally formed haulageway. If the feasibility of such a haulage gap is not clear, compare the space for wastebank with the spoil to be placed there.

It is not practical to switch one of these immense stripping shovels around a sharp corner. Therefore, four wedge-shaped cuts are next made—two on each side of the haulageway. Thus an easy curve has been produced which the machine can make without backing. Two small shovels are put at work, one loading coal in one pit, the other loading fireclay in the second pit. Track for the coal end of the mine is laid on the coal, but the line for the clay shovel is put down along the base of the adjacent wastebank.

If the material under the coal is not valuable, but a large output of coal is desired, two stripping machines and two coal-loading shovels may be installed by using this 90-deg. field plan, one set operating in each pit. The wedge cuts shown in the sketch would not be necessary in that instance, as neither shovel would have to

Starting from a corner, a thoroughcut is made along one boundary throwing the overburden toward the inside of the property. From the end of this pit, the shovel makes alternate short and long cuts. The object is to keep the machine working at 45 deg. to the property line and dumping toward it, thus filling in the stripping face left in making the thoroughcut.

When a true diagonal position of the field is reached, the second thoroughcut is made along the other property boundary. A repetition of the cutting which took place in the other half of the field occurs until the last cut coincides with the diagonal. The boundaries are safe as the waste has been banked up against them.

If only one boundary was in need of protection, the second thoroughcut would not have been necessary. The operations could have continued from the diagonal by making alternate long and short cuts until the opposite edge was reached.

Many other arrangements or combinations of these systems will suggest themselves as improvements on those described, but some such plan must be used for

FIG. 12

#### Picking Table for Strip Pit

Picking tables of this order are commonly used so that the bogey of dirty coal may be lifted from the name of stripping. Nowadays, some of the most elaborate cleaning and sizing plants are located at the big strip pits. In earlier days coal was sometimes loaded by railroad shovels into gondolas and went to market uncleaned. This gave strip coal a bad name.



make the turn. Each would work up to the corner and then return.

Fig. 10 gives another plan for operating two sets of machines in a field which has light overburden through the center, but heavy at the edges—that is a field in a valley. The thoroughcut is made through the middle for the entire length of the property. At the end of this cut, the shovels diverge. By thin cutting near the haulageway and heavy cutting at the crop or property line, field conditions gradually become such that the two pits are in a straight line.

As with the 90-deg. system, each set of machines works up to the haulage and returns. The operations are constantly nearing the tippie, thus decreasing the length of the haulage, as is the case with the retreating system of underground mining.

#### HOW TO AVOID CAVING AND SPOILAGE SUITS

Let us suppose that two sides of a field are property lines which must be respected, that is, they must be left in such condition that when the stripping is completed that they will not cave in. Fig. 11 gives a method of protecting the boundary without losing a big strip of coal, if for any reason the right angle plan is impracticable in the field being operated.

successful strip mining. Haphazard stripping always results in blocks of coal left here and there in the field, useless handling of overburden and shut-downs. But with a good coal bed, a system and regard for the relations of stripping and mining, the modern stripping shovel will accomplish all that can be desired in overburden from nothing to 40 ft. deep.

The near future will undoubtedly see a machine with a dipper capacity of 12 cu.yd. and of sufficient size to achieve the same results as the shovel just mentioned but with a cover 60 ft. deep.

MUD-SLINGING TANK bespreads mine with rock dust—On the truck of a coal-mine car, W. J. Reid, Superintendent of the Lion Coal Co., at Wattis, Utah, has mounted equipment for spraying the roof, ribs and floor of the mine with a mixture of rock dust and water which adheres to everything it touches like whitewash. With one passage of this machine proceeding at about 1,500 ft. per hour a thick coating of mud is distributed which covers the entire periphery of the heading. This mud dried by the air passing through the mine turns to a fine dust. The rock dust used by Mr. Reid in his demonstration in Mine No. 1 is made from a shale which forms part of the hills in which the mine is driven.



# Concentrating Tables—Their Operation and What Results They Obtain in Cleaning Anthracite

Used First Eight Years Ago — Clean Sizes up to Pea — “Tabled Coal” Demanded in Some Markets—Clinkering Eliminated—Less Ash After Burning—Reduced Labor — Increased Boiler Capacity — Regulatable Ash Content

BY JOHN GRIFFIN\*  
Wilkes-Barre, Pa.

AS HAS BEEN stated previously in this periodical, the art of coal preparation today is in a state of flux, changes and improvements taking place with almost bewildering rapidity. Taking a leaf from the notebook of the metal-mining industry, some anthracite operators years ago experimented with concentrating tables for cleaning the smaller sizes of anthracite. In this case, however, what corresponds to the gangue of the metal mine in its low specific gravity, is the cleaned product of the coal mine, whereas the concentrate of the metal mine is analogous in its high specific gravity to the worthless rock, slate and refuse extracted from the coal.

Concentrating tables have now been in commercial operation on the smaller sizes of anthracite for about four years. Their product, meanwhile, has proven so satisfactory to consumers that in certain markets a definite demand has been created for what is called “tabled coal.”

About eight years ago the first concentrating table was tried on buckwheat No. 4 anthracite. The machine tested was a standard table as used for ore concentration. The trials, however, indicated its practicability and also that better results might be secured by redesigning the machine, giving it a larger deck, better suited to meet the conditions encountered in coal cleaning.

In the spring of 1920, after much experimentation at the testing plant of the Deister Concentrator Co., Fort Wayne, Ind., the first Deister-Overstrom diagonal-deck table designed for coal washing was installed in the Wadesville breaker of the Philadelphia & Reading Coal & Iron Co. This machine was put to work treat-

ing barley, or buckwheat No. 3 coal. About the same time the Hudson Coal Co. installed a duplicate of this table in its Loree breaker for experimental work in cleaning No. 4 buckwheat.

## EXPERIMENTS PROVE UTILITY OF TABLING

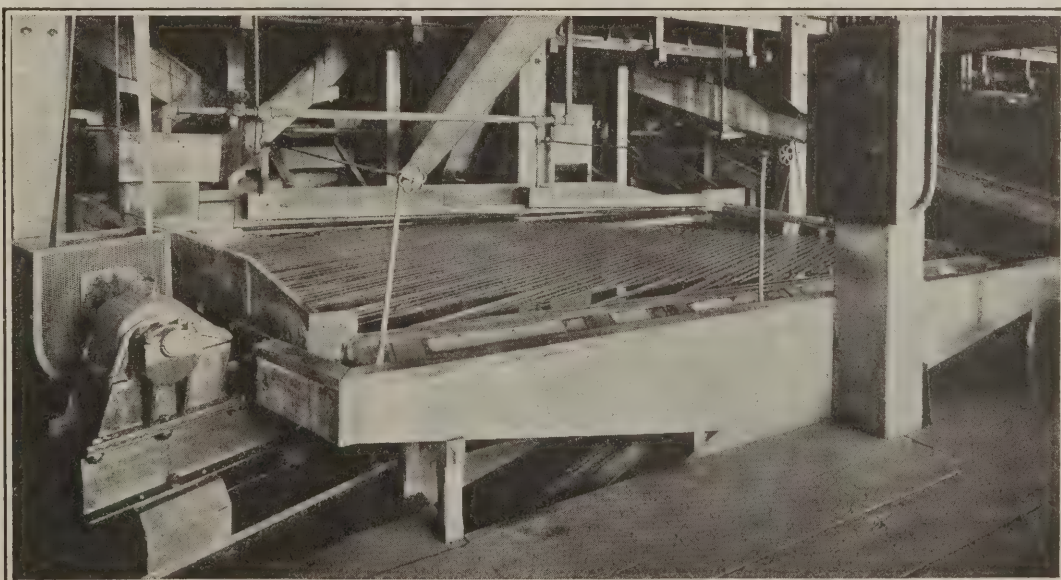
The success attained with these admittedly more or less experimental installations led to the adoption of the table at many breakers throughout the anthracite region. It is estimated that over three hundred machines of this kind are now in use and that about 6,000,000 tons of coal are treated by them annually. Not only are these machines employed on the buckwheats Nos. 1, 2, 3 and 4, but tests on pea coal have shown highly interesting results.

Many of the early tables were installed for the purpose of cleaning coal for use in the mine boiler plant. In many cases the use of tables has reduced by half the quantity of ashes and refuse taken from the boiler ashpits and has entirely eliminated clinkering. Furthermore, in addition to enabling the boiler plant to operate at a higher capacity, table-washed fuel has in many cases reduced boiler-room labor between 25 and 35 per cent.

Again, in not a few instances, satisfactory boiler operation has been obtained from table-washed barley, whereas prior to its use a generous admixture of rice or even buckwheat No. 1 was necessary in order to carry the load. The weight of fuel consumed in such cases has not been increased. Results obtained in their own boiler plants convinced the coal companies that the use of tables would permit them to offer the public a superior fuel in the shape of table-washed steam sizes.

FIG. 1  
Cleaning Buck-  
wheat No. 1

The riffles on the platen of this machine appear to be set diagonally. As a matter of fact, the table does not have a rectangular but a parallelogrammatical outline, and the riffles extend in the direction of oscillation. Greater capacity from a given area is thus obtained.



\*Manager, Anthracite Territory, The Dorr Co.



Like the jig, the concentrator table utilizes the difference in specific gravity between coal and slate in obtaining a separation of these substances. The preparation is, of course, wet and takes place on a deck, platen or table inclined both longitudinally and transversely. The transverse inclination, however, is far greater than the longitudinal. This deck is covered with strips or riffles extending throughout its length and is reciprocated approximately 265 times per minute, the amplitude of each stroke being about  $\frac{3}{4}$  in.

The material to be treated, with about twice its weight of water, is fed to the table at its highest corner. Water-distributing boards along the upper edge of the deck keep a sheet of water flowing across it. Under the action of this water and the reciprocation of the table, the various particles stratify in accordance with their respective specific gravities. Thus the heavy uncombined ash-forming substances, such as pyrite, sand, rock, slate and the like, seek the surface of the table between the riffles, by which they are guided to its end where they are discharged. The coal on the other hand, being lighter, is washed across the riffles and into the clean-coal launder or chute.

The above is a general description of the action of any concentrator table. Specifically the Deister-Overstrom coal-washing machine is built with a "diagonal deck." This affords a table, the boundaries of which closely coincide with the well-defined lines of separation between coal and refuse. More efficient washing is thus obtained from a given deck area.

#### DISTINCT SEPARATION FORMS BALD SPOT

The distinct separation between coal and refuse is evidenced by a "bald spot" at the juncture or corner of the coal side and refuse end. Thus all coal is washed

TABLE I—Capacities of Concentrating Table in Relation to Size Treated

Size	Tons of Feed per Hour per Table
Buckwheat No. 1.....	15 to 20
Buckwheat No. 2, or rice.....	12 to 18
Buckwheat No. 3, or barley.....	6 to 14
Buckwheat No. 4.....	4 to 6
Slush.....	2 to 5

off the deck before reaching the end of the table, and the refuse is discharged well away from the coal side. This assures complete separation into a refuse-free coal and a coal-free refuse, without the production of any middlings product requiring retreatment or separate disposal.

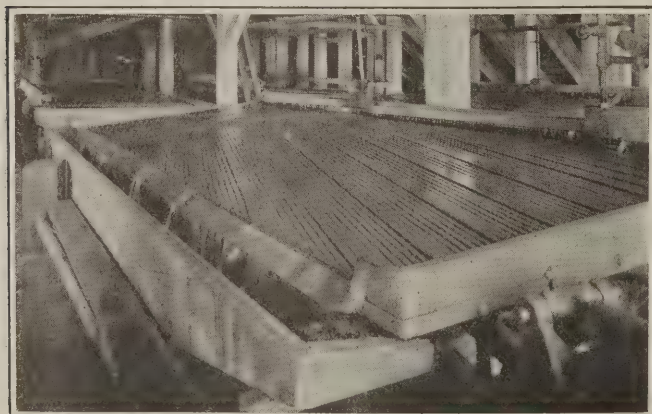


Fig. 2—Rice-Coal Tables in the Lehigh Field

In use, a concentrator table is inclined in two directions—a slight longitudinal inclination and a far more pronounced transverse slant. Adjustment of these slopes determines the quality of coal produced.

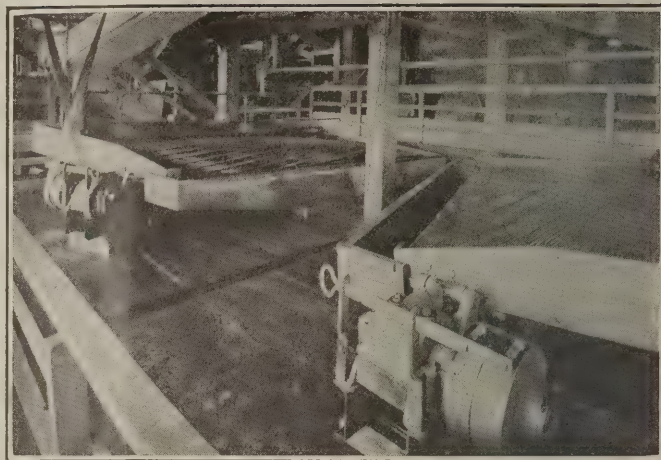


Fig. 3—Rice and Barley Tables

At present tables are used mostly in treating steam sizes. For this purpose they form part of the regular equipment of many a breaker or washery.

If for any reason it is desired to split the clean coal into two or more products, this may be done with ease. The coal discharged near the feed end of the table will be low in ash, and that leaving the platen nearer the refuse end will be higher in ash-forming material, as this heavy material crosses the riffles more slowly than the lighter coal.

#### SIZE OF MATERIAL TREATED INFLUENCES CAPACITY

The capacity of a coal-washing table varies somewhat, depending upon the size of coal treated, its character (as the difference in specific gravities of the materials to be separated affect the ease of their separation) and also the quality of clean coal desired.

In general, larger sizes of coal can be treated at higher capacities than the smaller sizes. Again, if coal extremely low in ash is desired from a table, the tonnage treated will be somewhat less than that handled under normal operation. The range of capacities given in Table I has been obtained when treating various sizes of anthracite.

The effect of the quality of clean coal obtained upon the capacity of a table is well illustrated by the results obtained on barley coal at a certain breaker near Scranton. When producing one carload of clean coal per day, that is, handling between 50 and 60 tons of feed, the ash in the tabled product was between 10 and 11 per cent. When, however, the output was increased to 85 tons per day, the ash ran 12 to 14 per cent.

Recent tests on buckwheat sizes Nos. 1, 2 and 3 at a breaker in the southern field and extending over three or four days' operation on each size, gave excellent results so far as tonnage handled, recovery of clean coal and quality of product were concerned. These results are given in Table II.

#### EXCELLENT RESULTS OBTAINED WITH FINE COAL

At this breaker, tests were also conducted on pea coal, five carloads being made in two days or in a total working time of 17 hr. This indicated a production of 13.2 tons of clean coal per hour from a feed of 20.2 tons. Analysis of samples of the raw feed showed that it contained 38.5 per cent of refuse, whereas the cleaned product had only 5.74 per cent. Analysis of the refuse discharge showed 2.02 per cent of coal in the reject. These results indicate a recovery of nearly 99 per cent of the coal in the feed, and a removal of 90 per cent of the refuse from the material tabled.



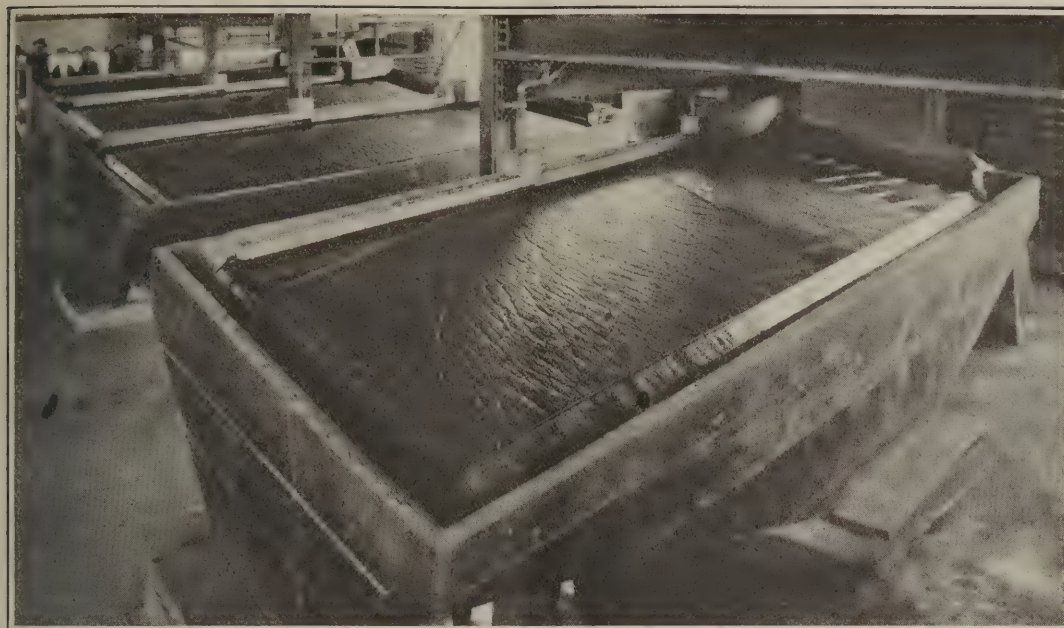


FIG. 4  
Buckwheat No. 4  
Tables

Four tables cleaning this small size of coal between  $\frac{1}{8}$  in. and 65-mesh. In all there are eight tables used in this breaker for cleaning this extremely small coal. Table capacity decreases with a decrease in the size of coal treated. The quality of both coal and refuse may be varied with the setting of the table and the quantity of feed handled.

In the accompanying illustrations, Fig. 1 shows a coal table that cleans No. 1 buckwheat at a breaker in the Lehigh field. Fig. 2 shows four similar tables that clean rice. An 8-hr. test on three of the four tables of Fig. 2 showed a production of 373.7 tons of clean coal, analyzing 13.20 per cent ash. The feed to these tables contained 21.3 per cent ash, and the refuse product leaving them carried 73.9 per cent of ash. Each table averaged 18 tons of feed and 15.6 tons of clean coal per hour.

#### WASHES FINEST SIZES OF COMMERCIAL COAL

Fig. 3 shows two coal-washing tables, one for rice and one for barley, at a breaker in the Lehigh field. Fig. 4 shows four tables out of a total of eight installed in a breaker in the southern anthracite field and operating on buckwheat No. 4. This installation, when six tables are operating, produces 200 tons per day of buckwheat No. 4, analyzing 13 to 14 per cent of ash from a feed containing 25 to 30 per cent of ash.

At a certain breaker in the Wyoming field, a low-ash buckwheat No. 4 is being produced. This is coal that passes through a  $\frac{3}{8}$  in. circular opening, but is retained

reduction in the ash content of the material treated, to handle large tonnages and produce a product of uniform quality from a raw feed of varying quality. When properly installed, they are easy to operate and low in operation costs. Thus, with the table it is possible to effect great reductions in the ash content of the material treated without undue loss of coal to the refuse and with a reasonable capacity. Furthermore, the table is highly flexible in its operation and permits of a fairly definite control in the quality of the coal produced; that is, at the will of the operator, the product may be made either medium or low ash as desired.

### Shall Central Power Stations Leave Cities And Be Re-Erected Near Mines?

The proposal to establish near pit heads a number of superpower stations for electric supply has fired the imagination of laymen and newspaper writers both here and in England, says the *Electrical World*. Even engineers who ought to know better have succumbed to the suggestion. There is no doubt of the savings in the generation of electricity made possible thereby; but the trouble is, and it is an insuperable one, that nature has rarely seen fit to put coal and water together. However, for every ton of coal burned under modern power-house boilers, from 600 to 1,000 tons of water are required to condense the steam discharged from the turbines. That is why superpower stations must in the main be built on large rivers or at tidewater, and that is why the great interior cities of this country and of England are handicapped in the erection of superpower steam stations. Coal is usually obtainable, water is not; and modern stations require a thousand times more water than coal. As a matter of fact, the Waterside station in New York City pumps more water for condensing purposes than the whole city of New York consumes for all purposes, and the same is true of the Commonwealth Edison Co. of Chicago and numerous other public utility companies possessing huge steam generating stations. A station at the coal mine is ideal, but, like many ideals, rarely works out when put in practice.

TABLE II—Tests on No. 1 Buckwheat, Rice and Barley Anthracite

	No. 1 Buckwheat	Rice	Barley
Breaker time, hours and minutes.....	33.27	25.30	23.30
Number of carloads produced.....	8 $\frac{1}{2}$	6 $\frac{1}{2}$	5 $\frac{1}{2}$
Clean coal produced, tons.....	371.55	307.50	243.90
Feed to table, tons per hour.....	19.27	17.95	14.43
Ash Analyses:			
Per cent ash in feed.....	43.30	35.75	33.53
Per cent ash in clean coal.....	15.43	15.03	17.46
Per cent ash in refuse.....	80.60	78.19	74.72

on a 200-mesh screen. After passing over the tables in this plant, the ash in the finished product ranges from 9 to 11 per cent. Because of the extremely small size of the material treated and the low ash in the product, the feed averages only about two tons per hour per table. The result of one month's operation showed that the feed to the tables averaged about 29 per cent of ash, while the average ash in the clean coal for the same period was 9.5 per cent.

Tables employed to clean the steam sizes of anthracite have demonstrated their ability to effect a great



# A British Solution of Coal-Mining Problems

Would Have Nation Acquire Ownership of Coal Lands and Leave Operation in Hands of Concessionaries Subject to Leasing Agreements, Providing for Better Housing and for Royalties Based on Coal Values

BY GEORGE OTIS SMITH  
Director, U. S. Geological Survey,  
Washington, D. C.

"COAL AND POWER" is the title of a concise and readable report issued July 12 by a committee of the Liberal party under the leadership of D. Lloyd George. The linking of the reorganization of British coal mining with the larger program of the rejuvenation of British industry is doubly significant in a semi-official document appearing at the close of the World Power Conference in London. Mr. Lloyd George's committee concludes its proposals with an eloquent reference to the first industrial revolution that began one hundred and fifty years ago, when steam brought in its train evils as well as benefits—"a dirty and smoky civilization."

Now, we are entering the early stages of a second industrial revolution when electricity may be the means of repairing these evils, by giving us a clean civilization and by decentralizing industry thus rendering possible a healthier distribution of people over the face of the country. The Lloyd George report has met with criticism as a political paper, but the Liberal party has clearly sensed the great possibilities of a better utilization of Britain's coal resources, and has stated plainly the social ends to be attained—that much is above party and indeed may be common property of all nations.

The dissatisfaction with existing conditions which our British cousins feel is all set forth as the premise of this report, and it all has a familiar sound. The miners complain of inadequate and unequal wages, of housing conditions worse than those of other workers, of excessive royalties to land owners (a burden to the industry actually small but psychologically of considerable weight with the miners) and of non-participation in the control of the industry in which they invest labor and life.

The mine-owner is likewise dissatisfied; labor unrest and political action interfere with economic law; exactions of landowners make efficient operation still more difficult; and absenteeism and shortness of working hours prevent greater production. The consumer in turn objects to the price of coal, which has risen more than 100 per cent, whereas cost of living has increased 69 per cent, and miners' wages, only 66 per cent. The British consumer suspects the coal merchants are making too much, and he freely charges that either bad organization or profiteering is the explanation of the price he pays.

More emphasis, however, is laid on the failure of

the coal-mining industry adequately to serve the nation; high costs of coal production threaten to curtail Great Britain's foreign trade, which is vital to national prosperity; coal is wasted at the mines and uneconomically used in both factory furnace and domestic hearth; and here the first allusion is made to electricity and a larger supply of cheap power to industry, with a large annual saving of coal consumed.

Only one high light appears in the dark picture thus portrayed by this committee: the industry has worked out in its agreement of 1921, modified in 1924, a practical basis for the division of proceeds between capital and labor, here termed "a very remarkable achievement."

Before presenting the essential principles underlying the reform of the coal industry, the committee clears away the underbrush that obstructs vision, by rejecting all proposals for nationalizing or socializing

THIS report would have the working man a part of the governing body in the operation of coal mines. It recognizes the Pit Committee as a valuable restraining influence on the conduct of mines. It declares State control of industry was successful only because "an unlimited market for war products and no limit to the price which would be paid" facilitated administration. It views many older operations as uneconomic and would like to see them wiped out by a vigorous competition.

the mines. Those who point with pride to the success of State control of industry during the war are reminded of the reason why: "an unlimited market for war products and no limit to the price which would be paid."

The elimination of private capital by whatever name it may be called is believed to promise no real advantage to anybody; instead, constructive reforms are sought, "without depriving the industry of the essential vitamins of private enterprise," for "experience is overwhelmingly against the successful administration of a business enterprise by a bureaucracy." Italy is now in fact denationalizing, while in Germany "at this moment the State mines are being made over to private companies."

The constructive program of reform set forth in this report starts out with the proposal for the State to acquire control of the coal resources by purchase of property rights from the 4,000 royalty-owners. The purpose of thus vesting in a single central authority the control of the coal measures arises from the conception that in a modern industrial society the State should not undertake creative and productive functions but rather "should see to it that the necessary conditions shall exist in which the creative enterprise and energy of its citizens can most effectively operate."

With 4,000 royalty-owners, there plainly can be no far-sighted or co-ordinated administration of the national mineral estate. In granting leases to State-owned coal, the Royalty Commissioners can select lessees best capable of working the resources efficiently,



which in the majority of cases would be the present mining companies, but also leases might be granted to co-operative societies or miners' guilds, the sole test being capacity to undertake the business.

Amalgamation of companies or of mines up to the limit of efficient units of operation and management should be facilitated, but in the main the initiation of schemes for such grouping "should come from inside the industry," amalgamation being thus "piece-meal, scientific, and in the main voluntary instead of wholesale and automatic." This policy of removing obstacles to larger and better mines is worthy of adoption on this side of the Atlantic.

Next in order is the proposal to alter the status of the miner, from whom the industry is getting neither the best nor all he can give. The British mine worker has a heritage of accumulated knowledge and experience, but his thoughts operate in a single channel, namely, wage negotiations, where moreover there is antagonism rather than co-operation with capital and management.

Except for collective bargaining upon wages, these million British miners, who are citizens of the Empire, have no say in the affairs of the industry in which they spend their lives, although they are just as much affected by the prosperity of the industry as the shareholders. The miner, therefore, cannot be expected to forego any longer an effective voice in policy but the road of advance here pointed out is not to discard the experience of initiative and management on the part of the mine operator but to bring about co-operation between mine-workers and mine-owners on "terms which share knowledge and responsibility for the general policy between the two, but do not impair efficiency in the execution of an agreed policy."

A mine, like a ship, must be under the direction of an executive with authority, "whose duty it is to make decisions and to give orders which must be obeyed." Experience has shown however that a pit committee "both helps the management to come to a right decision and prevents them from coming to a wrong decision." Such pit committees, as well as the district mining councils, should consist of equal representation of management and workers, and their functions would include "the safety, health, and welfare of the workers, and the maintenance and increase of output."

"The interests of capital and labor in these matters are fundamentally the same." Except as these common interests are yoked together, there will continue the antagonism which expends energy which ought to be directed to one common end. Only by accepting the responsible co-operation of the miner can the operator expect to educate him regarding those economic laws which express the necessity of making the industry pay.

An interesting side light is thrown on the British problem by the statement that war and coal control "retarded the natural process of obsolescence," with the result that both labor and capital are engaged in mines

where neither can earn its wage. "Coal ceases to be an economic asset when it is only obtainable under grossly uneconomic and uncommercial conditions"—a stage believed to have been reached in some of the older pits in Great Britain. So it seems, the survival of the fittest is an economic law that must be allowed to operate on both sides of the Atlantic. Therefore, the Committee attaches great importance to the progressive substitution of new mines for the older ones. It is the key to the problems of better housing and of wage disparities. To pool all mines would involve grading down, to open better mines means grading up.

Housing conditions, of course, vary greatly in the vicinity of British mines as they do here in the United States, but the general squalor and lack of sanitation as described in this report are far worse than the worst even in the older camps in our coal regions. Therefore, the committee makes it a cardinal part of its proposal that the Royalty Commission will insist as a condition

of a lease that a generous and enlightened housing scheme is undertaken. It is this power of attaching conditions that gives the State the power to wisely regulate the industry, but that regulation must be based on clearly understood general principles.

Royalties should be exacted not with any aim of making a profit to the State, as the primary need is coal at the lowest possible price for the use of industry in general. The royalties on new leases should be graded

so as to minimize the difference between rich and poor mines, even exempting mines with poor seams.

A National Mining Council is proposed as a part of the machinery for securing full co-operation in the industry, by including more general representation on both sides; such a body could advise the Royalty Commissioners in matters of policy, administer the National Welfare Fund, and keep the public informed on the facts and so allay suspicion. In only one point is it proposed that the National Council have any part in fixing wage rates. In the case of a deadlock, the issue is to be referred to this bipartisan Council and no strike or lockout can take place until its report has been published.

The legislative recommendations submitted perhaps have less interest to the American reader of this report, but throughout the logic of the British situation there described and of the remedies there proposed is a logic that appeals to those of us who seek peace and prosperity for the coal mining industry in the United States. The hundred and thirty-odd small pages sparkle with phrases that help to hold the reader's interest, such as: "the essential vitamins of private enterprise" or "bad housing means a tragic waste of human material."

Indeed, a half dozen sentences can be quoted that brilliantly summarize the fundamental premises of this report: "We are once more drifting into a head-on collision between those who believe nationalization solves everything and those who believe the only course is to leave things alone. It is highly undesirable that a

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**T**HE Liberal Party of Great Britain under the leadership of David Lloyd George has brought out a semiofficial program condemning national operation of coal mines but advocating a leasing system closely comparable, it would seem, to the methods of European continental countries where the ownership of minerals is vested in the state and operators are concession holders subject to State regulations which dictate economic policies as well as safe and hygienic operation.

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great industry should be made the plaything of party conflicts. There is an immense difference between running an administrative service and producing commodities or raw materials for sale in a competitive market.

"No conceivable reorganization of the industry can evade economic laws and escape the necessity of making the industry pay—unless indeed it is proposed to treat the mining industry in the same way as the Navy or the Army, a point on which the taxpayer would have something to say. Everything, wages, profits and prices, depends directly upon the efficiency both of miner and management; unfortunately—mere love of work for its own sake is not an all-sufficing incentive.

## England Five Years After the Peace Still Is "Seeing It Through"

By E. J. MEHREN  
Vice-President, McGraw-Hill Co.

THE WAR is past history in America, but current history in Great Britain. So, indeed, it seems after spending a week in Britain's capital, conversing with her men of affairs and listening to addresses by her business leaders and statesmen. True, there are war scars in the United States, scars that will never be erased. We are mindful of the men who died in the great struggle; we have great numbers of disabled veterans. On the financial side we still have, and will have for many years, a war-swollen budget and correspondingly increased income taxes. But, by and large the war shadow has thinned out. In the last two years we have had "good times." Our war-time income tax rates have been twice reduced. Certainly the way is not blocked by serious obstacles. The difficulties we foresee are merely the fluctuations which, except for the "panic years," one might say are normal to business.

Not so with Britain. The war is only a yesterday with her, and the consequences are still sharp upon her. I do not mean that she is discouraged; that word has no place in the British vocabulary, nor has the state of mind it indicates any place in British consciousness. But the burdens that weigh her, the obstacles still to be overcome, are fully appreciated and are a stock subject of discussion with all her thinking men.

To enumerate some of the troubling factors: 1. There is still large unemployment—though the amount is lessening. 2. There is marked depression in the "engineering trades," as they are called here—ship-building, machine-tool building, and the metal fabricating industries generally. In construction there are few large projects in hand, though there are a few that, after long delay, now seem likely to be taken in hand. 3. A new housing bill, that will again dip heavily into the national and into local government treasuries—and increase, accordingly, national and local tax burdens—is before Parliament. 4. The income-tax rate on even small incomes is 4 shillings 6 pence per pound sterling, or 22½ per cent. The super-taxes are very heavy. 5. The Continental problem is acute and the consequent uncertainty, the upset exchanges, the diminished purchasing power, curtail British export markets. 6. Finally, the never-ending exchange of views, with their Continental war Allies, on German reparations, keeps before the British people constantly the fact that peace, though declared five years ago, is not yet here. There

The mainspring of efficiency must be the actual personal responsibility of the mine-owning concern for producing coal at a remunerative cost. It is mainly by enabling the miner to increase his output that better wages for himself, more prosperity for the industry generally and cheaper coal can be secured."

Nearly a half of this short report is devoted to the title, Power, and is an appeal for the better use of coal by its economical conversion into electrical energy. But interesting as is this strong statement and gratifying as are the frank references to the better status of the American industrial worker, it is another story, though an appropriate sequel to the British report here reviewed.

is cessation of military activity; there is not that accord which is peace in actuality.

In private conversation one gets an even more serious picture of England's difficulties, for there the talk turns to social conditions. Briefly, the burden of these conversations can be reduced to just this: that the altruistic promises of war times and the coddling of politicians have taken from the mass of British workers a sense of responsibility for their own welfare and led them to expect the government to take care of them.

Such an attitude, of course, leads, and has led, to shiftlessness, inefficiency when at work, failure to provide for the rainy day—in a word, all of the economic vices of a dependent, spineless people.

The worst of the difficulty is that no one with whom I have spoken about this attitude of the people seems to have any hope for early improvement. The politician—not the statesman—is the ruler of the day, and as with us, he does not hesitate to sell the public treasury in order to advance his personal interests.

Withal, though, it should be repeated, that the Englishman is not discouraged. He has lived through a lot. He hopes that he will live through this trying period, and that a better day will come.

His way is not our way. We would think that his more or less complacent attitude might be fatal. He believes that the situation will turn out all right; we would fear that it would turn out all wrong unless vigorously handled. (One recalls our Unemployment Conference of some years ago.) We, I hope, would turn, so long as possible, to private measures of relief. The British have turned to the Government. The difficulties, of course, were very great; the amount of unemployment, for example, quite large. Possibly with similar conditions we would have been forced to a similar solution, but I am inclined to believe that the British tap the national treasury with less hesitation than we. The actual war, let us recall in possible explanation, lasted twice as long for them as for us.

But though our methods might differ from those of the British we cannot withhold our admiration of their sterling qualities. Similar conditions would put us in a panicky condition. They go on hanging out their sign "business as usual," confident that eventually all will be well.

Looking back on their long and brilliant history, we, too, can feel confident that somehow the Briton will come out on top. Trial and difficulty develop stamina and character. They are developing them right now in business circles. In the wage earning classes the tendency is in the opposite direction. Eventually, under the example of conscientious leaders, even that tide should change.



# In Any Coal Mine Electricity Will Bear Watching\*

Use of Electric Current Underground Is Safe Only if Properly Guarded—Shock, Gas Ignition, the Explosives Hazard and Mine Fires are Some of the Dangers to be Forestalled

BY L. C. ILSLEY  
Engineer, U. S. Bureau of Mines  
Pittsburgh, Pa.

IN ALL coal-mine applications electricity cannot be considered as other than a hostile friend. Its service to the industry is inestimable, its utility unquestioned, yet just so long as this invisible power is not adequately and scrupulously safeguarded, its hostility is liable to be felt. Although the adoption of this form of energy has done much to reduce the hazards of shotfiring and mine illumination, it must be carefully handled even in these uses. In fact, it will bear watching everywhere. And in order to reduce its hostility, mine operators should give serious thought to the prevention of shock, to the avoidance of dust and gas ignitions, and to the elimination of the explosives hazard, as well as to the prevention of haulage accidents and mine fires.

In making provision against electrical shock, the primary consideration is the voltage of the circuit. No one can be sure that he will be immune to even a 110-volt circuit, provided he makes such complete contact with it that the full current passes through his body. As the potential of the conductor increases so does the danger incident to contact with it.

Because of a lack of room, insufficient light, the presence of moisture and for other reasons, the underground worker is less readily guarded than the man employed upon the surface. All stationary motors underground, as well as switchboard frames and metallic casings containing electrical parts should be permanently and effectively grounded.

Substations and other places where it is dangerous for men to congregate or loiter, should be fenced off and only such persons as are required to perform the

\*Abstracted from a paper by Mr. Ilsley, presented before a recent safety meeting of the National Safety Council, St. Louis, Mo.

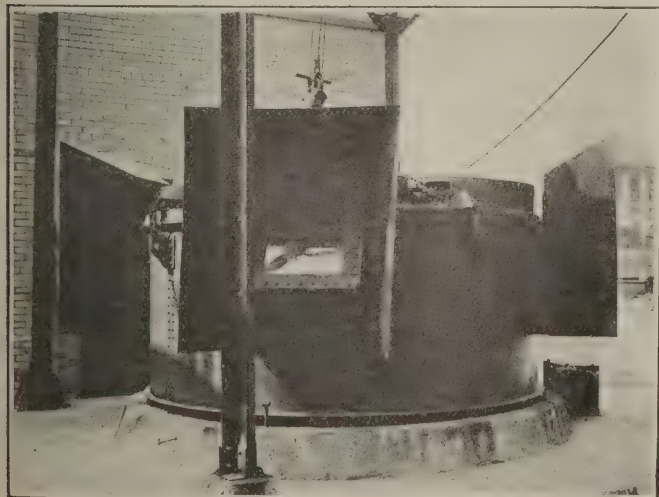


Fig. 1—Testing Gallery of the Bureau of Mines

In this or a similar chamber all manner of electrical devices for use in mines are subjected to various electrical tests to determine their fitness to bear the permissible label. Observations may be made through the shielded windows.

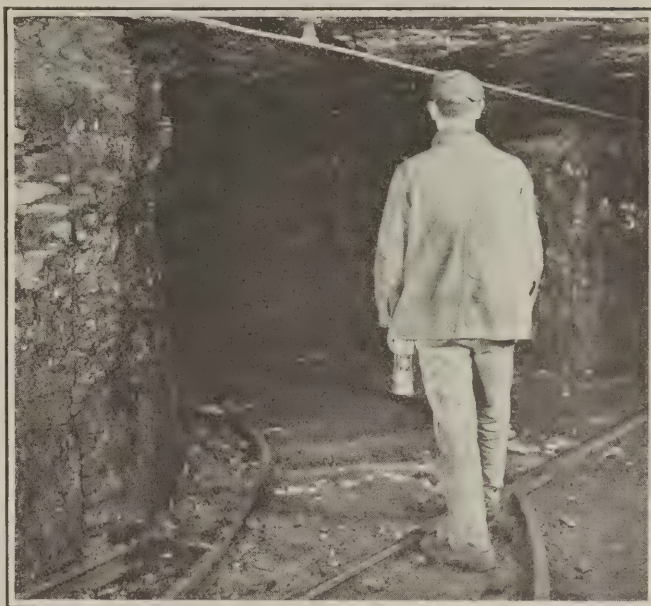


Fig. 2—An Unguarded Trolley Wire

This trolley wire extends across a room neck where loose rails have been stored along the rib. A man entering this room is liable to strike his head against the trolley wire or to touch it with a drill or auger held upon the shoulder. A serious accident may result.

routine work of the mine should be permitted to enter the inclosure. Maximum feasible clearance should be allowed all conductors and in so far as practicable they should be confined to one side of an entry or other passage.

## EXPOSED CONDUCTORS SHOULD BE GUARDED

Where of necessity men must work regularly under trolley wires or other conductors, these should be guarded. When men are actually working upon an electric circuit, precautions always should be taken to render it impossible that such circuits should be unexpectedly energized by the closing of a switch or by some other means.

A recent step toward safety in coal production is the wireless mine. Though the chief purpose of keeping all conductors out of the underground workings is to obviate the explosion hazard, this provision greatly reduces the danger from electrical shocks. Two large operators already have begun the use of storage-battery locomotives for all classes of work underground, thus doing away with all permanent wiring inside the mine.

Second to the danger from electric shock is that from gas ignition. Three conditions are necessary to render possible an ignition of gas from an electrical source within a mine. These are: (1) An accumulation of methane or other inflammable gas; (2) a flash or arc from an electric circuit or machine; and (3) the flash or arc must take place at the point where the accumulation of gas has occurred.





Fig. 3—Trolley-Wire Protection Is Good Insurance

Where trolley wires or other conductors cross room necks they should always be inclosed by guard boards held by strong iron braces affixed to the trolley hangers. An occasional bump on an unwary head is much better than a death-dealing shock.

For methane the proportion of intermingled gas necessary to form an explosive mixture lies between 5 and 15 per cent. The spark or flash liable to cause an explosion may be extremely minute. For instance, the tiny spark that may be evolved from a small hand-operated blasting machine is sufficient to set off the gas; or the heat of a 2-volt, 1-amp. electric bulb is likewise ample.

Accident prevention, therefore, signifies keeping such tiny sparks away from the places where gas may possibly accumulate. Pieces of electrical apparatus approved by the Bureau of Mines for use in gaseous atmospheres are safeguarded in various ways. Thus, electric lamps are provided with a bulb-ejecting device that kicks the bulb out of contact in case the glass is ruptured, thus cooling down the glowing filament and preventing it from igniting any gas surrounding it.

In like manner the spark-producing parts of approved electric motors or other machines are so inclosed that any sparks or flashes evolved within the equipment during operation can only ignite the mixtures contained within the compartment walls.

In many mines much apparatus, from a safety viewpoint, may be considered substandard. Such equipment, while built along explosion-proof lines, would in many cases allow flame to pass through the joints. The advantages inherent to permissible equipment are as follows: The apparatus is constructed in accordance with drawings on file with the U. S. Bureau of Mines and the design cannot be modified without due consideration to the effect the changes might have upon safety. Special attention is given them while in process of manufacture. Most companies have special factory inspection sheets that must be filled out for each approved machine calling attention to numerous parts that need specific treatment.

Permissible machines are subjected to actual tests to prove their mechanical strength. They are tested in gas to establish their ability to retain all flame within their inclosures, inspected to insure that they have no through openings leading to their interiors and to see that all bolts are securely fastened. Permissible com-

partments are given special attention at the points where wires enter them. These places are frequently overlooked in unapproved equipment.

In the recent past more attention has been given to the prevention of coal-dust explosions than to any other class of mine hazard. The conditions that favor such explosions from electrical ignition are a dense dust cloud in the presence of an electric arc or flash.

Dust may be raised in a cloud within the mine workings in any one of several ways. For example, a fall of coal or rock may stir up any dust on the sides or bottom of a roadway. A runaway trip may knock down timbers and release the dust resting upon them, or a blown out shot may raise dust in a room. A coal-cutting or loading machine operating in dry coal beds may, in the regular course of daily operation, create clouds of dust.

Electric flashes may occur from a broken lamp bulb, from the blowing out of a fuse, by the operation of a circuit breaker, by the throwing of a switch, the flash of a commutator, from the arc of a trolley wheel or from a broken trolley wire, light wire or feeder, from a short circuit of lighting or feeder cable, or in one of many other ways.

Direct ignition does not constitute the greatest danger of a dust explosion but rather indirect ignition. That is, while it may be difficult to secure exactly the right combination for an electric ignition of coal dust, it is comparatively easy to ignite a small pocket of gas. Such an ignition in turn may stir up sufficient dust to propagate the explosion throughout the mine and prove a hundred times more disastrous than the gas explosion alone would have been.

In seeking a preventive for dust explosions, therefore, one must not only eliminate direct ignitions of dust by electric arcs, but also prevent ignitions of gas. In case gas ignitions occur, the dust throughout the mine either should be so thoroughly saturated with moisture or intermingled with inert non-combustible material as to be incapable of propagating an explosion.

In present-day mining, electricity and the safe han-



Fig. 4—A Permissible Electric Cap Lamp

For actual work at the face the electric cap lamp has largely supplanted the old flame safety lamp. For this purpose, it is lighter, more efficient and gives a steadier and more powerful illumination.



ding of explosives are closely associated. Electrical shotfiring is highly popular. A number of electrical problems are involved in bringing the current to the detonator when and in the quantity needed, as well as in keeping it away from the detonator at all other times.

#### TRANSPORT EXPLOSIVES IN INSULATED BOXES

To fire an electric detonator may require only 0.35 to 0.50 amp. of current. As a consequence, all stray currents must be carefully kept away from the ends of the detonator wires. Nor can anyone be careless with these wires when near an electric circuit, no matter how low its voltage or how seemingly insignificant the current carried. Detonators accordingly should be carried to and from the mine in insulated boxes, and when preparing for a shot care should be taken to see that the ends of the wires do not come

lines extend outside the mine they should be protected from lightning discharges. Ample switches should be provided for keeping the circuit open except when shots are being fired. Rubber-covered wire should be used for temporary and portable firing lines in order to minimize the danger of shots being fired prematurely should these conductors come in contact with other circuits.

Attention of the Bureau has been called to the overheating of detonator leg wires and the ignition of gas from this cause. A preliminary investigation of this hazard has resulted in the following recommendations: (1) Detonators should be connected in parallel-series, series-parallel, or straight series. (2) The current should not be allowed to flow through the connections more than 0.2 sec. (3) Electric detonators with copper lead wires should be used. (4) The standard volt-

FIG. 5

#### A Safe Substation

All danger points in substations should be effectively fenced in. The word "Danger," which is well understood nowadays by every one in America no matter what may have been his native tongue, should be prominently posted at conspicuous points.



in contact with live electric circuits or other electrical apparatus.

Black blasting powder is readily ignited by electric flashes; consequently great care should be exercised to keep the containers of such powder away from all electric wires and apparatus. All powder should be transported in special cars or boxes, so constructed that no metal on the inside of the compartment, such as nails, screws or bolts, may carry electric current from the outside to the explosive.

Not all blasting machines are safe for use in gaseous mines. Even the little hand-operated device commonly used for firing from one to three shots is capable of producing a spark that may ignite gas. Machines on the permissible list of the Bureau have been cured of this danger and while satisfactory for single-shot work, they do not emit a spark capable of igniting methane.

Permanent lines used in electric shotfiring should be kept away from other electric circuits. Where such

age of the firing current should be the lowest that will satisfactorily fire all of the detonators as connected. Thus, if a 220-volt circuit is ample to furnish at least 2 amp. of current to every detonator, a 600-volt circuit should never be used. (5) The firing circuit should not be grounded.

In any shotfiring system, the circuit should be so arranged that not less than 1.5 amp. will pass through the bridge wire of each detonator. Though a small current may fire some detonators, they vary appreciably in the resistance they offer, and sufficient current should be provided to assure the detonation of all of them.

Haulage accidents rank second only to falls of roof and coal in the toll of life and limb which they exact. Statistics show that 341 fatalities occurred underground in the year 1921 and 340 in 1922 from mine cars and locomotives; 25 and 32 fatalities occurred on the surface from the same causes during these respective periods. Though the record of these accidents is



not segregated as to the type of haulage, beyond question a large proportion of them occurred in connection with electrically propelled locomotives.

#### THIRTEEN PERTINENT SAFETY SUGGESTIONS

The following suggestions may be offered as partial remedies for electric haulage accidents. (1) Provide good brakes on all haulage equipment. (2) Provide a good roadbed, track of ample weight and suitable frogs and switches. (3) Provide a separate manway; keep the haulageway clean. (4) Where men must travel on haulageways, provide sufficient plainly marked man-holes or refuge holes and proper means of access to them. (5) Keep roadways well lighted. (6) Provide ample clearance on at least one side of the roadway. (7) Keep the timbering in good condition. (8) Provide a tail-light on all trips. (9) Provide ample head-lights. (10) Provide derailers or runaway switches on

bulbs may start a fire from the heat generated by them if they are installed too close to flammable material.

Many of the foregoing dangers may be obviated by the proper installation of apparatus and circuits. Electrical machinery should be installed in spacious, fire-proof rooms and be well supported on substantial frames set on fireproof foundations. Insulators should be placed sufficiently close together to keep the wires from touching coal, rock or timbers. Wires should never be strung over timbers or in places where they cannot be readily inspected. Temporary wiring should be discouraged. Stations containing oil-filled equipment, such as transformers, should be so arranged that if oil is spilled it will not escape from the room.

All circuits and apparatus should be of sufficient size to perform their functions without overheating and should be protected by current-interrupting devices against sustained overloads. Automatic reclosing cir-



FIG. 6

#### How a Dust Explosion Looks at the Mine Mouth

This particular explosion was staged purposely in the Bureau of Mines experimental operation near Pittsburgh, in order that its effects might be closely studied. Much of our present-day knowledge of how to make coal mines safe has been derived from just such experiments as this.

all slopes and planes and gongs on all locomotives. (11) Prohibit excessive speeds. (12) Enforce discipline, especially in regard to riding on locomotives or trips. (13) Prohibit the making of flying switches and eliminate the pushing of trips.

Next to open lights, electricity presents one of the most prolific sources of mine fires. Any machine that is overloaded or that has become worn out in service may break down, causing electric arcs and flashes capable of igniting any inflammable material that may be at hand. In fact every electric circuit is a possible source of fire. Circuits may cause flashes when the wiring becomes grounded, when the circuit is opened under load (accidental breakage of the wires by a fall) and by the short circuiting of conductors of opposite polarity. Certain electrical devices, such as switches and circuit breakers, flash and give off arcs during normal operation. Oil-filled apparatus is especially dangerous if the oil becomes ignited, due to the failure of the equipment. Stationary electric lamp

cuit breakers are proving successful on main-line circuits, but would probably add to the fire hazard if installed on branch lines.

Rooms containing electrical equipment should be kept free from inflammable substances. All wiring should be kept clear of all such materials, and firefighting equipment should be kept in every underground station. This should be of such a nature as to be effective in coping with electrical fires. Grease and oil should not be allowed to collect on or about electrical apparatus.

In certain cases electricity has increased the fire hazard in mines, but when it is used for mine illumination or for shotfiring the opposite is true. The electric cap lamp has replaced thousands of open lights which have always been a potential fire hazard. Electric shotfiring does away with the fuse or squib and in many cases with the open light for igniting it. It thus appreciably reduces the fire risk. One chief mine inspector affirmed that the electric cap lamp alone is worth the cost of the Bureau's electrical section.



# Rocky Mountain Men Strike New Note in Dusting

All Adobe Not Equally Good—Danger of Siliceous Dust Questioned—Best Dust Wasted in Surface Grinding—"Mudizing" Idea Stirs Up Debate—"Days of '49" Turns Rock Springs, Wyo., Into Rip-Roaring Town

COAL MINING men from all over the mountainous West spent three days in Rock Springs, Wyo., last week delving into the problems of rock dusting and coal loading. They also banquetted royally with the folks of Rock Springs, took many a whirl at the old-fashioned faro and roulette, visited the mines of the region and watched a Wyoming state first-aid meet on the last of their three days—Saturday, Aug. 9. It was the summer session of the Rocky Mountain Coal Mining Institute.

The technical sessions brought out data about the rock-dusting methods now prevalent in New Mexico, Utah and Wyoming and which are getting started in Colorado and the results of some loader experience, principally that of the Union Pacific Coal Co. at its Reliance and Hanna mines. These sessions also gave opportunity for some discussion of mine fires and methods of controlling "bumps" in coal seams, not to mention some frank talk about what ails the coal industry. President Eugene McAuliffe of the Union

Pacific Coal Co. was a main contributor to this. President William Littlejohn of the Institute and Vice-President Brunell presided, aided and abetted by Secretary-Treasurer Benedict Shubart.

The hospitality of the dusty city of Rock Springs—a community of 9,000—made a deep impression upon the visiting Instituters, many of whom had never been in Wyoming before. They had pictured the town as the dirty western coal camp it was during the early years since coal began to be produced there in 1867. They found some handsome buildings, including the new Elks home where the meeting centered, some stores, a theater, a lighting system and a hotel or two that would do credit to a much larger city, and about everything else considered necessary in small city life except one municipal ingredient—green grass. The blades of grass in Rock Springs can be counted on the fingers of an armless man—almost.

The faro and roulette of Rock Springs were not an integral part of the city. They were resurrected from the distant days when Rock Springs, was a roaring gambling center along with Butte, Mont., Carson City, Nev., and the other famous hells. "Them days is gone forever," but a few Rock Springs gentry got out their four-gallon hats, slipped unaccustomed feet into high-heeled boots with scroll work on the legs, slung big sixes on their hips, and opened up a lot of games in the "Days of '49" entertainment on the second night

of the meeting. The institute never fails to "register."

The banquet on the first night, at which George B. Pryde, vice-president of the Union Pacific Coal Co. presided, was another handsome bit of entertainment by the city. About 400 were present. Mr. Littlejohn, whose brogue is a standing target for fun at all Institute meetings—Ben Shubart contends Littlejohn speaks with a thistle in one hand and a shamrock in the other

—was one of the speakers. S. W. Farnham, chief engineer of the Goodman Manufacturing Co. was another and T. T. Read of the Bureau of Mines added a gracefully humorous wind-up. Then an excellent local orchestra and the girl scouts of the town entertained, the girls staging a take-off on the day's technical session of the Institute, even to the cigaret which K. H. Marshall of the Bureau had carried to the speakers' table.

The summer meeting wound up Saturday with a demonstration by the Bureau of Mines of dust explosions following the state first-aid meet, in

Rock Springs' First-Aid Park. The only business transacted by the Institute was the unanimous adoption of a long report by its safety committee and a decision to encourage the states of Wyoming, New Mexico and Utah to follow the lead of Colorado in recognizing the miners' competency certificates issued by that state.

The adobe dusting system used by the Phelps Dodge Corporation at its mines in Dawson, N. M., was described by William Moorehead. He told how the dust is gathered outside the mine by a clamshell bucket and hauled in railroad cars to the mine where it is loaded into mine cars. It is scattered on the main haulways by hand after all loose coal has been removed from the mine at least down to a point three inches below the rails. This dries out and is spread both by passing trips and by trees which are dragged through the mines at intervals, usually during the night.

Also adobe dust is sun dried and screened outside the mine and the finest of it, passing a 20-mesh screen, is blown into the intake air course at intervals through holes in the stoppings. Further direct application to roof and ribs is made by using the Cement Gun. The wet method of deposit is far more satisfactory than any other, Mr. Moorehead said, because it reaches every crevice and causes the rock dust to give a strongly adherent coat to the roof and the sides of the entry. Also it can be deposited in a thicker coating than dry

## "MUDIZING," A NEW SAFETY TRICK

ONE of the most talked of subjects at the Institute meeting was the sort of safety "dusting" now practiced by the Lion Fuel Co. at Wattis, Utah. Superintendent W. J. Reid saves the cost of grinding rock dust by substituting adobe dust mixed thinly with water. This is sprayed through the mine by a blower and tanks, making a coating about 1-32 in. thick. He insists it is as effective as dry dust and is so cheap a process that he can afford to cover the mine frequently enough to keep down the percentage of accumulated coal dust. He has been "mudizing" about two months and says the coating dries in 48 hours, leaving thereafter a constant dusty surface which he thinks would be effective in stopping the spread of explosions. He has doubters.



fine dust. The mud coating protects the coal from slacking.

The Phelps Dodge Corporation also waters its mines thoroughly, carrying water lines to within 20 ft. of every face, but main dependence is placed upon the dust. This is not only applied wet and dry as described, but also is provided in the form of rock-dust barriers. Roof is brushed up high enough to erect 16-trough batteries and still leave 6 ft. of headroom. In order to prevent sagging of the troughs in the middle they are erected, on wide entries, in double rows. Mr. Moorehead said his company does not have any fixed maximum lengths for such troughs but they are always short enough to avoid bending under the weight of the rock dust—which is composed of concentrator tailings from a near-by mill containing 97 per cent incombustible matter. About 50 cu.ft. of this dust is loaded on each barrier of sixteen troughs.

Mr. Moorehead said the adobe dust spread on the roadways costs 10c. per running foot, and when stirred up according to the Phelps Dodge plan, is good for one year. Therefore 6,000 ft. of entry could be spread with dust for \$600 a year. One man is assigned to every 6,000 ft. to clean up the roadway and rake over the dust. This costs \$1,900 a year, figuring on 250 days' work at \$7.60 per day. Thus the cost of upkeep per running foot of entry is 31.7c. per year, and this plus the 10c. per foot for application makes the total cost on roadways 41.7c. per year. "Mudizing" entries on the other hand

costs the operator only 0.013c. per running foot. Ninety-nine per cent of the coal operators do not know definitely how explosive their mine dust is, according to K. L. Marshall of the Bureau of Mines, who made a short but pointed talk on coal dust, using samples to illustrate what he had to say. Altogether too many mine men think the dust on their roadways is not fine enough to be dangerous. He declared that in taking a 6-in. strip sample across any heading it is easy to get 4 lb. of dust fine enough to be explosive.

In coal that is without face planes, such as Pocahontas; as much as 10 per cent of the road dust will pass through a 200-mesh screen and therefore is most readily explosive and 20 per cent will be finer than 20 mesh, which is the Bureau's maximum size for dust that will participate in an explosion. In coals that show face planes, such as average Pittsburgh and Rock Springs coal, the percentages of fineness on roadways would be twice that of Pocahontas. Thus, according to Mr. Marshall, every mine is loaded with explosive dust, unless protective measures are taken, and the sooner the coal men of the country realize it, the better.

He said coal dust of 200-mesh fineness has no dimension greater than one one-thousandth of an inch and much of the roadway dust in the average mine has the impalpability of cigaret smoke. Hence the ease with

which it remains in suspension in mine air and hence, also, its readiness to propagate an explosion. In ordinary densities it will burn at a speed of 6,000 ft. per second, which is faster than ordinary powders, and as rapid as dynamite.

In the discussion that followed T. T. Read of the Bureau of Mines interestingly explained why fine coal dust is so inflammable. He said that coal dust in the air or on the roof, ribs and floor burns swiftly because the heat from each particle is communicated readily to the next particle. But if rock or adobe dust is present, the coal particles are separated from each other by barrier particles of non-combustible matter and the heat is absorbed by them. However, the rock or adobe must be of equal fineness with the coal if they are to be effective. Otherwise they would not remain in suspension with the coal and could not be present between coal particles when their presence was needed. Furthermore, this incombustible dust must be of a character that it will not absorb much moisture from mine air or it will become pasty, and thus ineffective. It must dry at the same speed as coal dust to avoid this separation from the coal. Few adobes will do this, so he places little confidence in adobe.

Eugene McAuliffe, president of the Union Pacific Coal Co., wanted to know whether it is essential to grind either rock or adobe to great fineness. If distribution of coarser adobe will do, the operator depending upon it to disintegrate in the road-

ways and get proper dissemination by the various stirring agencies, then his company would not go to the expense of installing a grinding mill. He got some comment on both sides of the argument, but the meeting came to no general decision.

Dan Harrington, now with the Utah Fuel Co. and the United States Fuel Co. in Utah, said ordinary adobe dust would do well without fine grinding in main intakes but that its character must be known definitely before dependence can be placed on it for moist mine interiors and return aircourses. Some adobe absorbs as much as 5 or 6 per cent of moisture out of mine air and therefore will not give satisfaction. Other adobe absorbs none. This type can be used without fine grinding, but when a mine does not have that kind of adobe it should use finely ground rock of some sort.

President Littlejohn said Utah had decided upon the use of finely ground limestone for barriers and for the dust zones nearby, but that adobe would be used elsewhere in Utah mines. W. D. Brennan general manager of the Phelps Dodge mines held that dry adobe is fine enough merely crushed. It does not have to be pulverized. Hand raking, ordinary travel and the other methods of periodically disturbing adobe dust in the mines at Dawson reduce its size and distribute it as effectively as though it were ground.

### DAN STARTS A DUST ARGUMENT

**I**S FREE silica in rock dust damaging to miners' health? All authorities in the coal industry have said it is and therefore all operators contemplating dusting their mines have felt that they must find a dust with practically none of it. Now comes Dan Harrington, one of the best known mining safety engineers in this country, telling the Rocky Mountain Coal Mining Institute that it is not so. He believes there is so little free silica in shale or rock dust that it cannot have any material effect on miners. Sharp-edged material ground down to 200-mesh fineness is so fine that it will not set up an irritation in the lungs, says Mr. Harrington. One dust is no more troublesome than another, he holds, and none of the fine dusts will cause trouble unless it is breathed in great volume. Average rock or adobe dusting of a mine would not produce this quantity.



His company takes it in from the streets and surface outside the mines. Only 10 per cent of it may be of 200-mesh fineness, but if any attempt were made to screen it, the real fines would be lost. So it is spread without screening. He pays boys 4½c. a sack to shovel it up at places where it appears to be finest. The cost of getting it to the mine is another 2c. This is much cheaper than grinding. Crushers would not work on adobe in wet weather, even if they were used.

Mr. Brennan believes barrier dust should all be of 200-mesh, but roadway adobe works well without any preparation.

#### WANTS LITTLE SILICA, CARBON OR WATER IN HIS

Capt. Jack Smith of the Union Pacific Coal Co. described the more or less well-known methods of dusting in Illinois, closing with a few conclusions of his own about dust. He advocates fine grinding, for it is his idea that only fine dust is efficacious. It should be practically free from silica, however, for the sake of the miner's health. It should have less than two per cent of combustible matter but in no case should it contain over 10 per cent. It should not be capable of absorbing more than two per cent of moisture from mine air and should be of light color to enable observers easily to determine when the slow admixture of coal dust with it begins to bring it to a combustible stage.

Fine grinding of any sort of material is cheaper in the long run, said Charles Leger of the Royal Fuel Co. He quoted John E. Jones of the Old Ben Coal Corporation of Illinois, a pioneer and close student of dusting, as saying that when dust is too coarse to be distributed by a blower, and is applied by hand, the cost is about \$12 per 1,000 lineal feet of entry, whereas blower dusting costs but 75c.

President Littlejohn thought a combined crusher and blower will soon be produced to do its crushing as it distributes the product. Thus none of the fines will be lost. Mr. Read had just remarked that he had seen most of the fine and really desirable dust escaping from a crusher in southern Illinois that tried to gather the pulverized material in a cyclone collector.

#### TILTING-BOARD BARRIERS UNDER A CLOUD

Reverting to the subject of barriers, Captain Smith said the so-called "concentrated barrier" once used in southern Illinois, made of a platform of wide planks each board tilting and dumping its dust in suspension when disturbed, was a failure. The boards warp slightly and do not trip when the trigger works. They are being replaced by steel construction.

At this point Mr. Harrington injected the opinion that the silica content of any rock dust is not a factor and should not be taken into consideration by the mine operator. The percentage of siliceous matter in any rock dust is so small and the quantity of rock dust in suspension in a mine is so trivial, at worst, that it cannot be any more injurious to the miners' health than coal dust or any other dust.

Mr. Read agreed that it would not be harmful in ordinary proportions after it was machine-applied, but that where dust is spread on roadways and stirred with rakes and brushes to get distribution, it might possibly be harmful if the silica content was high.

Then came a discussion about "mudizing." P. H. Burnell of the Lion Coal Co. described a machine his company is using at Wattis, Utah for the purpose. Adobe dust in water is drawn out of a tank by a centrif-

ugal pump, and sprayed on roof and ribs in a layer about ½ in. thick. The first coat washes down all the dust it encounters, penetrates everywhere and makes a perfect application at a low cost. The machine can coat about 1,500 ft. of entry in an hour.

Though it is true that coal dust and water will not mix, this adobe mud and coal dust will. A safe percentage of incombustible matter in the coal dust is certain, he said. It dries in 48 hours and thereafter, presents a surface that is dusty as chalk. The roof and rib surfaces offer little opportunity for coal dust to be deposited, and if roadways and faces are kept well sprinkled, he thinks, there can be little danger from coal dust.

"But that mudizing doesn't put much incombustible dust in the roadway," said E. H. Denny, district engineer for the Bureau of Mines. "How long will it take your mud to slough off a little and mix with road coal dust?"

"I don't know," replied Br. Burnell, "but mudizing is cheap enough to be applied often and if it is carried clear up close to the face and the mine is well sprinkled, there ought not to be much coal dust. It would be an absolutely dustless mine."

Mr. Denny remarked that it is next to impossible to get a mine perfectly clear of dust and that 5 oz. of fine coal dust per lineal foot of roadway is plenty to run a rip-snorting explosion.

*(Account of Rest of Meeting Will Be Published Next Week)*

ELECTRIFICATION GROWS at South Wales collieries. Great progress has been made recently in the electrification of the South Wales collieries, and, with the higher labor costs as a result of the recent agreement, a fresh stimulus has been given to the work of converting colliery power from steam to electricity. At the same time there is a great divergence of opinion on the question of central supply stations for a group of collieries. An instance of this is the total destruction of a central supply station at Ferndale, supplying power to eight collieries, which caused a shutdown of a month of all the pits involved. As a remedy for such a contingency it is proposed to interconnect a number of stations. Cardiff and Swansea are both increasing their generating plant for supplying electricity to collieries, and the output of the Cardiff City Station has more than doubled since the war. The local authorities at Newport, Bridgend and Neath are also augmenting their plants.

THE BUREAU OF MINES is conducting an investigation of mine wastes in relation to stream pollution. The investigation has been placed under the jurisdiction of Dr. Sayre, Chief Surgeon of the Bureau of Mines, in co-operation with the Public Health Service. It is being actively conducted by H. F. Yancey with headquarters at Pittsburgh. It is understood the investigation will require a year's time. Effort will be made to determine the facts as to pollution of streams by mines and remedies therefor with a minimum disturbance to the mining industry.

RECENT ESTIMATES of Utah's coal resources place the tonnage at 196,458,000,000 short tons. It is estimated that this is sufficient for the whole of the United States for 250 years. The state's coal mines employ 4,500 men regularly with an \$8,000,000 payroll.





## News Of the Industry



### Coal and Other Business Improving

Every Indication of Revival of General Business—Interest Rates Low—  
Increase in Tidewater Dumping—Law of Averages  
Would Indicate Hard Winter

BY PAUL WOOTON  
Washington Correspondent of *Coal Age*

Indications of a decided revival in business were being registered throughout the past week in the central offices in Washington of the far-flung systems of fact and figure finding, which are maintained by the Government and by more than three hundred trade associations. More than the usual significance is attached to these returns, as the country with its abnormal gold reserve and with unprecedented capital to be had at interest rates which have dropped to a new low level, could burst into a boom almost overnight. The abundance of credit is indicated by the fact that the Federal Reserve system stands at 83 per cent, far above the 40 per cent margin of safety provided by law. The explanation lies in the fact that the banks are so well provided with funds that they do not need to rediscount their loans.

Though the improvement in the business situation has extended over several weeks, the psychology which is a necessary essential to any big upturn of industrial activity has just begun to crystallize. It is admitted frankly that with it are elements which well may lead to inflation.

Coal already has responded to the improvement in business, and is expected to reflect promptly the prospects of a Fall and Winter likely to be marked by great industrial activity. There has been a sharp increase in tidewater dumpings. This reflects the increase in industrial activity in New England and at other points which secure their coal supplies from the coastwise trade. Dumpings have been at a rate higher than any level reached since March and close to the maximum for the year. All rail shipments to New England have increased. There has been a gradual increase in the quantity of coal dumped at lower lake ports. The tonnage dumped thus far this season compares favorably with that of normal years. The movement up the lakes has been retarded because coal has been slow in moving off the upper lake docks, but indications now are that this movement will be rapid from this time forward and there is every reason to expect that the close of navigation will show that this trade has been equal to that of the average year. The better situations in the steel industry and in automobile manu-

facture are regarded as being of particular significance.

As no one expects the production of coal in 1924 to fall under 450,000,000 tons, production at an accelerated rate cannot be delayed much longer. As the railroads last year handled in excess of 10,000,000 tons of coal for a period of sixteen weeks, there is no serious talk of a car shortage. At the same time, it is admitted that circumstances easily could combine so as to make for transportation difficulties in handling the considerable volume of the year's production which is yet to move.

If a spurt in industrial activity should materialize, as the signs now indicate, and should Winter weather set in early, difficulties might be encountered. Weather bureau records show that an unusual amount of mild Winter weather has been enjoyed during the past seven years. No long-time weather forecasts are made by responsible persons, but according to the law of averages which has been established during more than the one hundred years for which records are available, the prospects are for a severe Winter. The unknown quantity in the problem is the quantity of coal in storage, but since that probably did not exceed 36,000,000 tons on Aug. 1, there is insufficient margin to carry industries long if they are to be called upon for increased outputs.

### Beckley, West Virginia—Next Objective of Union

John L. Lewis, international president, United Mine Workers of America, Ellis Searles, editor of the *United Mine Workers Journal*, Oral E. Garrison, organizer, C. Houck, international legal department, motored from Charleston to Beckley, W. Va., arriving in the afternoon of Aug. 7. An inspection was made of the headquarters of District No. 29, which property is owned by the International organization, and a conference held with several of those who have been identified with the United Mine Workers.

Being interviewed, Mr. Lewis had nothing to say, but Ellis Searles remarked that immediate steps would be taken to reorganize the district operating it from the Beckley headquarters.

### Another Merger Rumored

Rumors are rife but not generally credited that some of the larger smokeless concerns in southern West Virginia had recently been approached with a view of merging them into one big company. The companies named are the New River Co., Macdonald, W. Va., the E. E. White Coal Co., Glen White, W. Va., the Pocahontas Fuel Co., Pocahontas, Va., T. E. Houston interests of Cincinnati, Ohio, the Tams interests in the Winding Gulf region and the Wentz interests in the New River and Virginia fields.

### Industrial Conference Board Sees End of Slump

The business tide has turned, is the conclusion of the Mid-year Bulletin on industrial and economic conditions in the United States just issued by the National Industrial Conference Board. The board points out that although production and distribution during the first six months of this year have been below that of the similar period last year, it should not be forgotten that the first six months of last year witnessed the height of the trade boom. The report calls attention to the fact that the index of production in basic commodities as compiled by the Federal Reserve Board for the first six months of 1924 shows an increase over the average index figures for the years 1920, 1921 and 1922. From 1920 to 1923 inclusive the average was 94; for the first six months of this year the average was 111.

"During July, 1924, a considerable betterment in sentiment has taken place," says the report, "for although production has not increased considerably, prices are firmer and inquiries in respect to orders are more numerous. Trade sources indicate that June marked the low point in business so far this year, and that the turning point has been reached. The belief that business this Fall will be good is quite general. Exports for the first six months were 7.4 per cent greater in value than for the first six months of 1923.

The researches of the board show that at the end of the first six months of 1924, the cost of living was 61.7 per cent above the cost in 1914 and that amongst the items of this cost of living, rents were 85 per cent above the level of July, 1914, in June 1924.



## Disorder Threatens in Mines Of Western Kentucky

After three and one half months' strike in District 23, western Kentucky, during which period a few mines have resumed operation on a non-union basis, trouble has broken out in which a few workers have been beaten, shots have been fired into miners' homes, and miners have been threatened for failing to quit work. In one case an old lady who owned property rented to workers was threatened if she did not make them move. Not much had been heard of the condition until Gov. Fields and state military officials started an investigation in the field, and press reports started appearing about July 26 or 27 concerning trouble.

However, investigations have failed to show that there has been any real disorder, or need for calling out any state troops. Five or six observation officers of the Kentucky National Guard have made an investigation in the Providence, Ky., district, where are the mines of the West Kentucky Coal Co., and the seat of most of the trouble. That firm has been trying to operate some of its St. Bernard mines under the mutual or welfare association plan, which has proven satisfactory in the old West Kentucky Coal Co.'s mines.

### Lewis Speaks at Miners' Meetings

Conditions in the field were running along quite nicely prior to the visit of John L. Lewis, national president, to the field. Lewis talked before numerous miners' meetings. At the same time many autos from Illinois and Indiana entered the field, some bearing signs reading "Herrin," probably as a threat and not as declaring that the cars were from Herrin. Miners of the Norton Coal Co. have received intimidating letters postmarked "Herrin."

Outsiders have been working hard to hold the union miners in line, and stop the desertions to non-union ranks. Much of the mine labor in western Kentucky is negro, and this type is quiet, and generally causes little trouble. However, the negro when hungry, or without money and clothing, or gasoline to operate his flivver, is not especially strong for unionism.

Around Madisonville and Earlington it is claimed things have been quiet and

## Bituminous Coal Loaded Into Vessels at Lake Erie Ports During Season to End of July

		(In Net Tons)								
		1924			1923			1922		
		Cargo	Fuel	Total	Cargo	Fuel	Total	Cargo	Fuel	Total
Toledo.....	Hocking Valley.....	3,123,137	92,469	3,215,606	2,314,486	69,256	2,383,742	1,492,230	36,331	1,528,561
	Big Four**.....	1,375	46	1,421						
	N. Y. C.-Ohio Central Lines.....	27,095	1,055	28,150	817,014	25,428	842,442			
	Baltimore & Ohio.....	768,400	25,778	794,178	1,233,115	36,349	1,269,464	1,649,323	40,916	1,690,239
Sandusky....	Pennsylvania.....	1,299,469	39,916	1,339,385	1,398,824	42,331	1,441,155	975,982	27,879	1,003,861
Huron.....	Wheeling & Lake Erie.....	365,880	17,686	383,566	718,221	26,586	744,807	7,612	334	7,946
Lorain.....	Baltimore & Ohio.....	795,192	64,967	860,159	1,511,966	86,094	1,598,060	17,820	16,069	33,889
Cleveland....	Pennsylvania.....	642,975	84,111	727,086	906,827	83,495	990,322	44,805	22,543	67,348
	Erie.....	151,289	5,618	156,907	475,844	20,649	496,493			
Fairport.....	Baltimore & Ohio.....	240,717	45,656	286,373	326,908	32,708	359,616			
Ashtabula....	New York Central.....	467,889	55,317	523,206	1,854,363	121,693	1,976,056	31,083	15,391	46,474
	Pennsylvania.....	525,338	41,553	566,891	1,020,053	42,721	1,062,774	30,393	16,708	47,100
Conneaut....	Bessmer & Lake Erie.....	834,364	113,034	947,398	1,394,998	98,505	1,493,503	58,139	1,207	59,346
Erie.....	Pennsylvania.....	245,541	37,645	283,186	311,596	39,842	351,438	28,607	31,148	59,755
Total.....		9,488,661	624,851	10,113,512	14,284,215	725,657	15,009,872	4,335,993	208,526	4,544,519
*1923 Storage Loading.....		182,060	4,940	187,000						

\* Coal loaded into vessels in December, 1923, after close of navigation and forwarded from Lake Erie ports during 1924 season. \*\*Lake coal into Toledo over Big Four Route and dumped by Ohio Central Machine.  
Compiled by Ore & Fuel Exchange, Cleveland, Ohio.

Utilities More Efficient  
In Use of Coal

Efficiency in use of fuel by public-utility power plants has increased 33½ per cent in the last four years, according to a statement by the Department of the Interior, which shows that a ton of coal in 1919 produced 625 kw.-hr. of electricity, compared with 835 kw.-hr in 1923.

The total amount of electricity generated increased in this period from 39 billion kw.-hr. to 55.7 billion kw.-hr. The statement said water-power development apparently is not holding its own with steam power in the production of electricity, showing a decrease from 37.5 per cent of the total production in 1919 to 34.8 per cent in 1923.

New York leads in the production of electricity, Pennsylvania is second and California third.

orderly, and at Central City there has been no effort to operate, and no excuse for any rough tactics. In the Providence section it is claimed that there are about 100 miners working non-union, and over 1,000 union men on strike.

### Alberta Strike Not Settled

The fourth month of the Alberta coal strike ended with July without any sign of a settlement. Efforts by the Labor Department of the Provincial Government to bring about a reconciliation between the miners and the operators have been unsuccessful. The Alberta government has no power to go further in the matter. Hon. James Murdock, Federal Minister of Labor, is expected to go West shortly and may take some action. William Sherman, president of District No. 18 U.M.W. of A., states that the miners are willing to meet the operators, on condition that there shall be no further effort to reduce the wages, but there is no indication that negotiations on this basis are likely to materialize. The loss to the miners in wages during the four months of the strike is estimated at approximately \$2,000,000.

## Ocean Carriers Revert to Use of Coal

The wide difference between the cost of fuel oil and the cost of coal is resulting in the reconversion of many ocean carriers to the use of coal. This was one of the significant trends which Dr. George Otis Smith, the Director of the U. S. Geological Survey, observed in Europe. Dr. Smith has just returned from London where he represented the Secretary of the Interior at the World Power Conference. Another development which has much significance for coal he points out, is the progress being made in the production of a liquid fuel with coal as the base.

"A power conference held in Great Britain," declares Dr. Smith, "naturally puts emphasis on coal. As I mentioned at one of the sessions of the World Power Conference, commerce in power already is an international matter. When consideration is given to the number of wheels, throughout the world, that are turned by British coal and by American oil, there is a greater appreciation of that fact. I saw electrical energy derived from British coal and from Swedish waterfalls at work in connection with the operation of Danish farms. This example is typical of the use of power which takes on an international character.

"I saw evidence that British shipping, at least, is trending away from oil as a marine fuel because the cost of coal is relatively so much lower. The price level of fuel oil was characterized as being 'totally unwarranted.' I was told that fuel oil was selling at Mediterranean ports at 87s. 6d. (\$19.93 present exchange) per ton as against 35s. (\$7.97 present exchange) for coal. Bunker coal was obtainable at United Kingdom ports, I was advised, at 20s. (\$4.56). Some oil-burning ships already have been reconverted to coal. Apparently this is prophetic of what surely will take place more generally at some time in the future unless economic processes are developed for using coal as the source of a liquid fuel.

"It is significant that so strong an interest as The Vickers is giving attention to processes for treating coal as the raw material in the manufacture of fuel in more convenient forms."



### Opening Gun in Plan to Increase the Safety of West Virginia's Mines

Open lights are doomed in the soft-coal mines of West Virginia, judging by a consensus of the opinion expressed at the safety meeting held in Fairmount, that meeting being one of a series called by the West Virginia department of mines for the purpose of obtaining suggestions as to sections to be incorporated into a new mining code for West Virginia. Mining men now are generally a unit in expressing the opinion there are no non-gaseous mines.

R. M. Lambie, chief of the West Virginia department of mines, said the open-flame lamp must be discarded. He regards that as the first precaution to be taken in guarding against serious accidents. Mr. Lambie cited several instances to show that some mines that had apparently never emitted gas had shown themselves gaseous after a slate fall. "It's not what you have, but what you might have," remarked the head of the department in summarizing the great danger which at all times was to be feared from gas in soft-coal mines.

#### More Speed for Bureau

Frank Haas, consulting engineer of the Consolidation Coal Co., said that some means should be used to get the U. S. Bureau of Mines to speed the process of testing and approving of machinery for use in the mines. He urged that it might be advisable for mine operators to let manufacturers of mining equipment know that approved machinery is in demand.

A practice greatly condemned by Mr. Lambie was the shooting of coal from the solid. V. G. Deahl of the Hiorra Coal Co. said that this practice was common in his field, attributing such violations to the loose practices which prevailed during the war.

#### Might Change Machines Over

Chief Lambie stated that although he wanted reforms in the state mining laws, it was not the desire of his department to force coal companies to put in approved equipment in the mines immediately, providing that they add safety devices to the present machinery.

E. P. McOlvin, of Clarksburg, stated that the state mining law should define the meaning of "shooting coal from the solid." Dean R. C. Jones, of the school of mines of the West Virginia University, suggested that a blank be issued by the department to be filled out whenever gas is found. He recommended that this be incorporated in the reports of the mine foreman and fireboss.

### White Will Head Coal Commerce Division

C. P. White, formerly in charge of distribution for the U. S. Fuel Administrator, will head the coal division of the Department of Commerce, a position that has been vacant since the resignation of F. R. Wadleigh. This place was offered to Mr. White at that time but just then he was not in position to accept it. Secretary Hoover felt the place well might be left vacant until a properly qualified man could be found. He also was influenced by the fact that the coal division was in the capable hands of F. M. Shore, who was Mr. Wadleigh's assistant and who has been acting chief since Mr. Wadleigh's resignation. Mr. White served as an assistant to Mr. Wadleigh while the latter was Federal Fuel Distributor. At that time Mr. White was in charge of the situation at the head of the Lakes.

### Dock Men Counter Attack In Northwest Rate Battle

The Northwest Dock Operators Association and other dock interests on Aug. 1 filed with the I.C.C. at Washington an answer to the various petitions that have been filed against the Sept. 10 increase in rates on Illinois coal going into the Northwest. The answer appears especially to be a reply to the long attack the Illinois Coal Operators' Association made two weeks before, in which they pointed out many commission errors and appealed for a reopening of the lake dock rate cases which they had lost.

In the dock men's reply, the Chicago law firm of Butler, Lamb, Foster & Pope declares that the so-called "errors" were not errors at all, that Illinois does not show that it has any new evidence to present which would be worthy ground for a reversal of decision by the I.C.C. and that therefore, there is no reason for a reappearing of the cases. The dock answer denies that the Commission based its decision on the fact that tonnage from the docks to the Twin Cities had declined while Illinois tonnage increased. This had nothing to do with the decision. It denies that the decision is illegal simply because the changes ordered will require other readjustments under the long-and-short-haul clause. Righting one wrong is not illegal merely because it does not right all the wrongs that exist.

#### Answer Justifies the Commission

The answer further holds that the evidence in the case proved that the same carriers control rates from both rail and lake territories of origin, and therefore the Commission was fully justified in removing the discrimination that existed. It held that the Commission did not err in making its order apply only to certain groups and not to all Illinois groups because the original petition omitted many. It contended, also, that exclusion by the examiner of evidence with respect to origination of dock coal in the Appalachian region was not erroneous because the dock rates are local rates.

### Canada Shares in Our Slump

The output of coal from Canadian mines during May declined to 708,004 short tons, being a decrease of about 30 per cent below the tonnage of the previous month—and the lowest point reached since April, 1923. The falling off was due to the Alberta strike and the lessened output of Nova Scotia owing to lack of orders. Production in Nova Scotia fell from 640,000 tons in April to 430,000 tons in May. There was a marked increase in the importation of coal from the United States and Britain, May imports amounting to 1,105,126 tons, as compared with 734,991 tons in April. Exports of coal were 47,905 tons in May as against 5,318 in April. The number of men employed in the coal mines in May was 20,007, the monthly production per man being 34.3 tons as against 48 tons per man in April.

### Old Ben Selling \$13,000,000 In Bonds and Debentures

Prominent among recent industrial financing is the issue of \$13,000,000 securities by the bankers on behalf of the Old Ben Coal Corporation. The offering will be made today of \$8,000,000 first mortgage twenty-year 6 per cent gold bonds and \$5,000,000 ten-year 7½ per cent debentures.

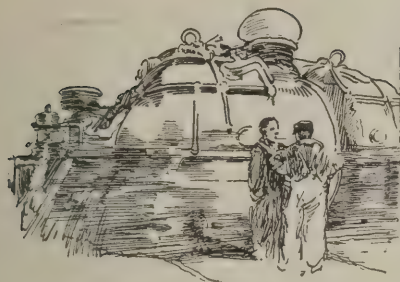
The \$8,000,000 issue is being offered by a syndicate consisting of the National City Company, Drexel & Co. and Cassatt & Co., at a price to yield over 6.17 per cent. The \$5,000,000 debentures are offered at 100 and interest by the National City Company and Cassatt & Co. The twenty-year bonds are secured by a first lien on all the mineral and surface lands, real estate, mine plant and equipment and other fixed assets of the corporation. For the debentures provision has been made for a semi-annual sinking fund commencing Feb. 1, 1925, sufficient to retire by lot \$250,000 par value of the debentures annually at 110.

The Old Ben Coal properties are in southern Illinois and include 56,800 acres of coal land. The average annual net earnings after depreciation and depletion, according to the bankers, are more than five times the annual interest charges on the \$8,000,000 of first mortgage bonds. Current assets are more than six and a half times current liabilities. The company is making extensive improvements.

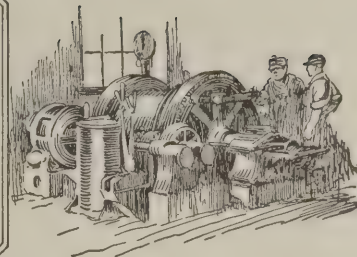
### August Circular Prices for Anthracite

	Broken	Egg	Stove	Chestnut	Pea
Philadelphia & Reading.....	\$9.05	\$9.05	\$9.25	\$9.05	\$6.00
Hudson Coal Co.....	8.90	8.90	8.90	8.90	6.00
Lehigh Valley Coal Sales Co.....	8.50	8.75	9.05	9.05	5.75
Pattison & Bowns.....	8.80	8.80	9.00	8.70	5.50
D., L. & W.....	8.00	8.65	8.65	8.65	5.85
Dickson & Eddy.....	8.80	9.00	9.20	9.00	5.80
Lehigh Coal & Nav. Co.....	9.05	9.05	9.30	9.15	6.00
M. A. Hanna & Co.....	8.80	8.95	9.45	9.05	5.75
Lehigh & Wilkes-Barre.....	8.00	8.65	8.65	8.65	5.75





## Practical Pointers For Electrical And Mechanical Men



### Should the Positive Conductor from a Mine Generator Be Grounded?

Direction of Current Usually Presents No Serious Problem—Standard Practices Should Be Followed to Simplify Conditions—Uniformity of Connections Reduces Hazards

A MUCH debated question at a certain mine in our neighborhood is whether it is safer and more efficient to transmit direct current from the power station into the mine and to various other points in and around the plant with the trolley wire connected to the positive or to the negative lead of the generator.

Let me outline the conditions at a plant to which I refer. Power is generated by a compound-wound direct-current generator at 250 volts. The current is led from the positive brush stud on the generator to a positive switch on the switchboard and from this board to the positive busbar. All mine tracks and other parts of the usual electric circuit were connected to the positive busbar at the switchboard. With this method of connection it is obvious that pipe lines and steel structures were being utilized as positive conductors and all feeder and trolley lines used as negative conductors.

The following questions arise as to the safety and efficiency of this system of transmission:

Question A—Does this system of transmission of an electrical current tend to create more or greater hazards to the workmen in or around the mine? Are workmen more or less likely, through grounds or other causes, to receive shocks with this system? Are the hazards of the accidental starting up of any electrical machine or device increased?

Question B—Is the fire hazard increased by this system? Are the pos-

sibilities of an explosion from coal dust or mine gas increased? Will current leakage produce more, or less, electrolysis?

Question C—Will the efficiency of the generators, motors or other electrical apparatus be impaired in any manner?

Question D—Will lightning arresters work effectively on this system?

Question E—Is the potential of the positive wire of this system at the earth's pressure, there being 250 volts pressure between the positive and the negative wires? Is the negative wire at a potential 250 volts below the earth's zero pressure?

THOMAS BRENNAN.

Bairdfield, Pa.

It is the usual practice at mine operations to connect the negative wire from the direct-current generator to the ground. The best results are usually obtained by making a direct connection to the mine track at a point as close as possible to the generator. However, so as not to depend entirely upon this connection to carry all the return current back to the generator, negative conductors are often run far into the mine.

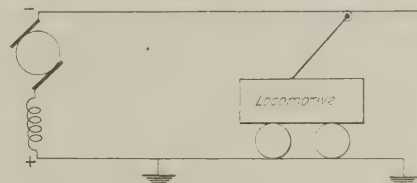
These ground connections are as important as the feeder lines, because it is necessary to keep the return circuit resistance as low as practicable so as to have good voltage at distant points in the mine. All current going through the machines used on direct-current circuits must pass through the motor windings and return to the generator. Wherever the current meets an obstruction, usually called resistance, a certain quantity of energy is lost in order to get through.

With most electrical apparatus it matters little whether the current travels in one direction or another; in fact, trolley locomotive motors are continually being reversed. The current flows in one direction continually only in those parts such as the trolley pole and sometimes the resistance, depending upon the connections used in the control wiring.

Some people have a false idea that only positive electricity does any work or can do any harm. This is not true. If the negative wire at the generator is

grounded, to stand on the ground and touch a positive trolley wire causes the current to flow downward through the body to the ground. On the other hand should the positive conductor of a circuit be grounded and the negative connected to the trolley, a person standing on the ground still gets a shock when he touches the trolley wire, but the current passing through his body travels upward through his feet.

The essential thing to remember is that current passes in one direction or



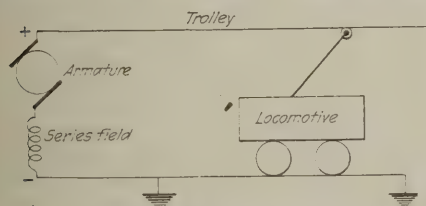
Negative Connection to Trolley

With a connection like this at one mine and the positive lead of the generator connected to the trolley at another mine it is possible to get a high potential difference between the two trolley wires at points where the systems come close together and thus create a hazard because of the high voltage.

another whenever a circuit is closed between the positive and negative leads of the generator. Unless this is done the current cannot flow. Consequently a person may handle or tread on any one of the two leads coming from the generator if he does not come in contact with the other conductor at the same time. However, such a practice is not advisable because the other conductor is not always apparent, it may be grounded or accidentally connected to some conducting material nearby and to touch this material while connected to the other wire would be equivalent to touching the other conductor direct.

The hazards due to grounding the positive wire from the generator and connecting the negative lead to the trolley are not great. As it is not the usual practice, a person working around a motor may test a certain wire and find it to be the negative lead and therefore feel quite safe in handling it, if he has been used to working in mines where the negative wire is grounded. Trolley wheels running against the trolley wires connected to the negative terminal of the generator usually sputter and throw off sparks more profusely than those running against positive trolley wires. Aside from these two hazards there are no further serious dangers.

If a negative trolley wire or feeder is given the same protection and care as a positive trolley or feeder the dangers are no greater from one than



Standard Generators and  
Trolley Connections

Sometimes the series-field end of the generator is made the positive terminal but connected to the trolley wire. This is done where the trolley wire is exposed to lightning in which event a lightning stroke generally breaks down the series-field winding and does not reach the armature. The series field winding is easier to repair than the armature.



the other. Accidental grounding of a negative trolley wire acts in the same way as an accidental grounding of a positive trolley; it closes the circuit on the generator. The same is true with the accidental starting of motors. The same conditions which will cause a motor connected to a positive trolley wire to start causes a motor connected to a negative trolley wire to start. The only difference is the direction in which the current flows.

The fire hazards are the same for both conditions because it usually matters little in which direction the current may be flowing. The spark is formed regardless of the direction of the current. If the voltage is high enough to create a spark, which is certainly true with a 250-volt circuit, gaseous mixtures or dust may be exploded.

However, electrolysis does depend upon the direction in which the current travels. Currents passing between two electrodes carry the metal of one over to the other. By reversing the direction of the current the metal which is the harder to break down may be carried away and in consequence the electrolytic action may actually be reduced. However in most mining work the seriousness of electrolysis asserts itself in connection with pipe joints and usually the damage done would be about the same regardless of the direction the current may be flowing through the pipes.

The efficiency of the generators or motors is not changed by reversing the flow of current. Many generators and most motors are designed to operate in either direction, and the reversal is

accomplished by changing the direction of the current in some part of the winding.

Lightning arresters are installed for the purpose of draining conductors of any abnormal voltages, and they will discharge just as soon as the potential difference between the two ends of the arrester increases to a sufficiently high value. The action of an arrester connected to a negative trolley wire is the same as with a positive trolley wire; it merely drains off to the earth any abnormal voltage on the conductor.

Any conductor directly connected to the earth takes its potential, because it then becomes part of what we call "ground." Pressures may be above or below the potential of the earth. Ordinarily the pressure at the earth is considered as zero. It does not usually matter much whether a potential is higher or lower than zero, the important fact is the volume of the difference of pressure between objects. As the pressure in the negative conductor of a 250-volt circuit is 250 volts below that in the positive wire, if the positive wire is grounded, the negative conductor has a potential difference of 250 volts between it and ground. In this case the voltage will have a negative value with respect to the earth.

These answers to the foregoing questions deal with the subject in a general way. Under certain peculiar conditions one system of generator connection is better than another, but usually it will be found best to connect the positive lead of the generator to the trolley and thus conform to the recognized practice.

much dirt and grit is encountered as in cement mills, brick plants, flour mills, or crushing plants. It is an excellent belt for use in hot and dry places. It is strong and durable, but must never be used in connection with finger shifters because such shifters wear the edges rapidly, causing them to fray.

There are a number of rubber composition belts on the market, and it is claimed by many users that these are superior to leather belts. It is my belief that the rubber belt is superior to the leather belt for use in wet or damp places. In fact, it has practically replaced the leather belt in all such places. Like the cotton belt, however, it must never be used in connection with finger shifters because it has a fabric core which will cause failure if the edges are once worn or frayed.

The life of a belt depends largely upon the start it gets, in the same way that the success or failure of a man depends largely upon the care given him during his childhood. Therefore, when putting a new belt on the pulley too much care cannot be given to it to see that it is put on correctly.

Shafts and pulley should be aligned as perfectly as possible so that there will be no side slipping, no forcing, no running off and no side pull.

Occasionally there is something inherently wrong in the belt itself so that after a few days of operation it will run crooked in spite of the care first given it. This may be due to the fact that one side of the belt was stronger

than the other, consequently the weaker side stretched most, and as a result the belt began operating imperfectly. When this happens the belt should be taken off and the imperfection carefully removed. Unless this is done it is obvious that there will always be some side slip or side pull and the life of the belt will be materially reduced. It pays to watch new belts carefully and see that they get a proper start in life.

It is impossible, of course, to answer the above question completely and with absolute accuracy, but the writer feels that his reply is at least more definite and more satisfactory than the reply given by the dealer.

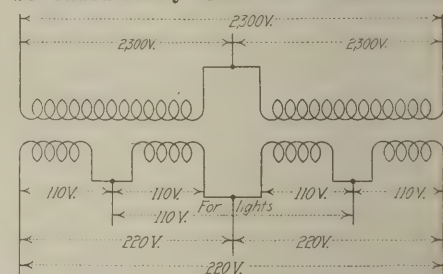
W. F. SCHAPHORST.

## Taking Taps Off Transformer For Lighting

At one of our transformer banks, consisting of two 25-kva. single-phase transformers connected in open delta, we desire to take off taps for supplying a lighting circuit. It has been proposed to connect the lighting circuit to use one half of each transformer winding. Will this connection work and give satisfactory voltage for 220-volt motors at the same time? The accompanying sketch shows the transformer connections.

St. Charles, Ky. C. E. ANTHONY,  
Dempster Coal Co.

Two transformers connected in open delta cannot be loaded so as to carry a load equal to the arithmetical sum of their individual capacities. For example, two 25-kva. transformers may be loaded safely to 44 kva. Care should



## Open-Delta Connected Units Supplying Lights

With this connection the transformers are arranged to supply 220-volt energy to a motor circuit and 110-volt energy for lights. Care should be taken when using this connection because the individual transformer windings are not uniformly loaded and may cause local heating.

therefore be used when transformers are connected in this manner.

A discussion of this subject was given in the July 10 issue of *Coal Age*. Here O. E. Kenworthy explains in detail the operation of the transformers.

The voltages supplied by two single-phase transformers connected in open delta will be balanced but care should be taken when using parts of the transformer windings for other loads. If the circuit shown in the illustration is used for lights the loads in the transformers are unbalanced and one section of a transformer winding will be working under a heavier load than the other. This may cause local heating, which depends upon the particular design of the windings.

## What Kind of Belt Should Serve My Purpose Best?

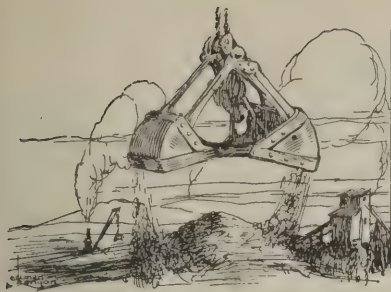
A belt user recently wrote to a dealer in belts and asked: "What kind of belt is the most economical in the long run?" The dealer replied: "The belt that will transmit the most power per square foot of its area during its natural length of service is most economical."

This answer may be correct. In fact, it is correct. But, now that the belt user has the answer what is he going to do with it? The answer is certainly a vague one. Very likely the user knew that much about it before he asked the question. What the user wants to know is, What kind of belt is the most economical in the long run—leather, cotton, rubber, camel hair, balata, etc.?

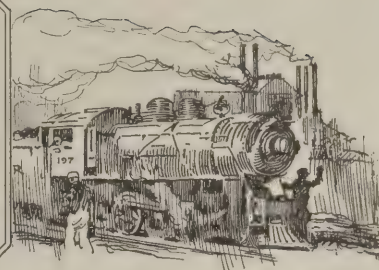
In spite of all the substitutes that have been manufactured, leather belting is still quite popular. It is the superior belting for general machine-shop work. Where belts must be shifted from pulley to pulley there is nothing better. In fact where finger shifters are employed nothing but leather belts should ever be permitted. Leather belts are also superior for use on quarter-turn drives, reversing drives, or wherever there is constant side pull, slipping, jerking, etc.

The cotton belt to a great extent has replaced the leather belt for power transmission on machines used out in the weather. Likewise it has replaced the leather belt in industries where





# Production And the Market



## Bituminous Coal Market Feeble but Reviving Anthracite Trade Slow and Weakening

If the revival of the coal trade does not come soon it won't be for lack of prophets and heralds. From reports one would think the bituminous-coal producer was anxious for a revival of his industry, but the truth is that the coal men are divided in sentiment. They don't like the present slackness. Who would? But they also realize that the longer it lasts the surer will be their reward at the end. If the market were to brisken now, the volume of business would increase, but it would not be profitable business. If it waits a few months more it will have not only volume but profit, not only current strength but voltage also. However, to have to wait is vexatious and it looks now, despite the Geological Survey's report as of August 2, as if a gentle increase in production will soon be on its way. Every-one forecasts either that or a wild market, and in a few places here and there a little improvement in the coal trade is manifest. The big fall trade, and the winter anxiety about fuel which has been prophesied will hardly come, unless someone whose opinion is recognized starts something and the public in a panic does the rest. It is more likely we shall see volume rather than profit. The public has so strong a hold on the situation that the coal man has to admit that the industry "functions badly" as far as his profits are concerned. However, if the indications of increased business—and there are but few of them—are illusory and the public continues to wait, the awakening may not be pleasant.

It is useless to consider the markets separately for they conform too closely to type. Something might be said as to the Great Lakes. There only a certain dock-age space is available and the unwillingness of the retailer to buy has cluttered the docks with coal. The Northwest does not have as much time as the rest of the country to satisfy its wants, so it would do well to get coal moving.

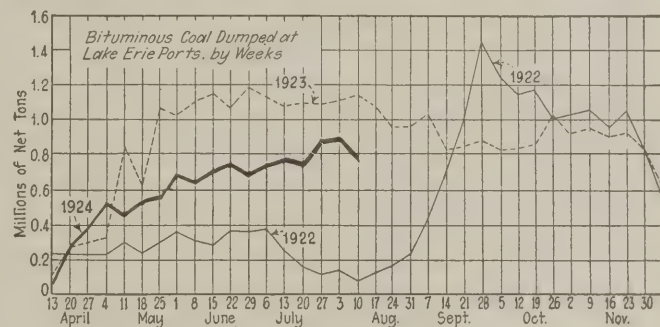
Coal Age Index of spot prices of bituminous coal

showed no change during the past week, standing on Aug. 11 at 163, the corresponding price being \$1.98.

Hampton Roads dumpings for all accounts during the week ended Aug. 7 totalled 358,916 net tons, a decrease of 3,084 tons from the week preceeding.

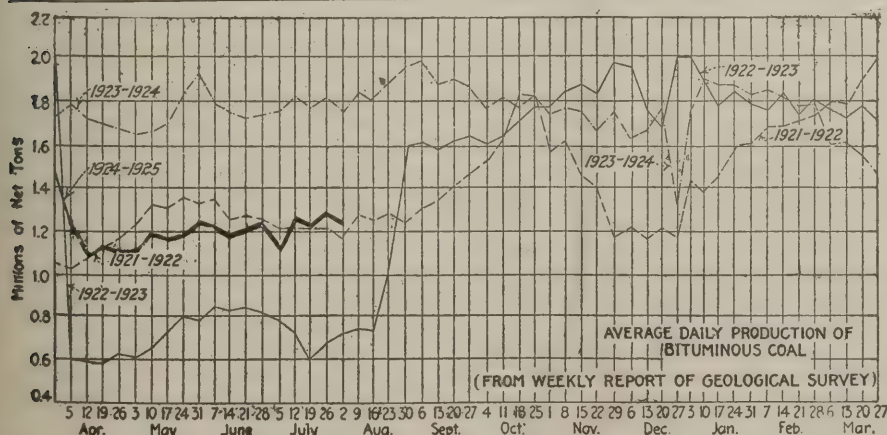
The movement of coal at the Lakes made a marked decline, being for the week ended Aug. 10, according to the Ore and Coal Exchange: For cargo 725,168 net tons and for fuel 47,054 net tons, as against totals of 830,915 and 44,066 net tons respectively the week before.

The production of bituminous coal for the week ending Aug. 2 decreased slightly, the output according to



the Geological Survey totalling 7,486,000 net tons. The previous week showed an output of 7,542,000 tons, according to the revised figures. Anthracite production decreased, being 1,720,000 net tons in the week ending Aug. 2 and 1,837,000 tons in the previous week.

The anthracite and bituminous coal markets, strange to say, are in a similar condition. Both are feeble, but whereas the anthracite sales are few but declining, the bituminous sales are few but increasing. Canada is still a weak market for anthracite. Winnipeg seems to be responding to the active efforts of the Alberta producers who are supplanting those of Pennsylvania.



### Estimates of Production

(Net Tons)

#### BITUMINOUS

	1923	1924
July 19.....	10,676,000	7,401,000
July 26.....	10,817,000	(a) 7,542,000
Aug. 2.....	10,564,000	(b) 7,486,000
Daily average.....	1,761,000	1,248,000
Cal. yr. to date (c).....	322,535,000	261,885,000
Daily average to date.....	1,772,000	1,440,000

#### ANTHRACITE

July 19.....	2,005,000	1,840,000
July 26.....	2,080,000	1,837,000
Aug. 2.....	2,018,000	1,720,000
Cal. yr. to date.....	60,834,000	54,189,000

#### COKE

July 26.....	363,000	99,000
Aug. 2.....	345,000	(a) 94,000
Cal. yr. to date.....	11,814,000	6,578,000

(a) Revised from last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.



### Midwest Sells Little for Storage

The midwest shows a little activity in a small way in the higher-grade coal for storage purposes, but nothing doing in anthracite, smokeless or coke. Medium Illinois coals are slow.

The warm weather during the past week is largely accountable for stopping of domestic orders. With no apparent increase in price the public is indifferent yet as to any great movement of storage. Wagon-load steam is at a standstill and carload steam is easy and not noticeable.

There is practically nothing doing in Southern Illinois although a little coal moves occasionally, but the tonnage seems to be dropping off except in spots. There is no great movement of any one particular size in the Carterville field. All mines have unbilled coal of all sizes, including steam. Railroad tonnage is light. Mines get from one to three days a week. The strip mines still continue to show good working time.

The Duquoin field is near at a standstill and the Mt. Olive district is about as quiet as it can be. A little railroad coal is moving out of this district and some small tonnage on contracts.

The Standard coal field is tied up with no-bill coal of all sizes. Screenings continue to go down, and the domestic sizes show no increase, excepting in 6-in. lump, which has moved up 15c. this week. Every kind of coal is lagging in a disheartening way. Railroad tonnage is off.

Chicago had a keen disappointment last week as business showed a notable slump. It is thought that previous activity was due to optimistic newspaper reports of farmer prosperity and a booming stock market. Evidently the coal market is to be left behind in the new prosperity.

### Kentucky Still Hopeful

Somewhat better demand for fuel is reported in the Louisville market. Domestic sizes are moving better, as the public is beginning to think about winter supplies, and better agricultural and general business conditions are resulting in more confidence, especially among wage earners. Retail prices have been firm since the April reductions, and it is generally understood that the market can move only in one direction and that is upward. Retailers are still slow in stocking, from fear of summer slacking, heating, etc., and because collections have been slow, and they do

### Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern		Market Quoted	Aug. 13 1923	July 28 1924	Aug. 4 1924	Aug. 11 1924†	Midwest		Market Quoted	Aug. 13 1923	July 28 1924	Aug. 4 1924	Aug. 11 1924†
Smokeless lump.....	Columbus....		\$5.85	\$3.85	\$3.60	\$3.50@ \$3.75	Franklin, Ill. lump.....	Chicago.....		\$3.90	\$2.85	\$2.85	\$2.75@ \$3.00
Smokeless mine run.....	Columbus....		3.00	2.10	2.10	2.00@ 2.25	Franklin, Ill. mine run.....	Chicago.....		2.85	2.35	2.35	2.25@ 2.50
Smokeless screenings.....	Columbus....		2.35	1.30	1.20	1.15@ 1.30	Franklin, Ill. screenings....	Chicago.....		1.65	1.70	1.70	1.60@ 1.80
Smokeless lump.....	Chicago.....		5.75	3.85	3.85	3.75@ 4.00	Central, Ill. lump.....	Chicago.....		2.60	2.50	2.50	2.50
Smokeless mine run.....	Chicago.....		3.00	1.85	1.85	1.75@ 2.00	Central, Ill. mine run.....	Chicago.....		2.10	2.10	2.10	2.00@ 2.25
Smokeless lump.....	Cincinnati...		6.00	3.85	3.75	3.75@ 4.00	Central, Ill. screenings....	Chicago.....		1.35	1.60	1.60	1.60@ 1.65
Smokeless mine run.....	Cincinnati...		2.75	1.85	1.85	1.75@ 2.00	Ind. 4th Vein lump.....	Chicago.....		3.35	2.60	2.60	2.50@ 2.75
Smokeless screenings.....	Cincinnati...		2.85	1.35	1.30	1.15@ 1.50	Ind. 4th Vein mine run.....	Chicago.....		2.60	2.35	2.35	2.25@ 2.50
*Smokeless mine run.....	Boston.....		5.60	4.30	4.30	4.10@ 4.50	Ind. 4th Vein screenings....	Chicago.....		1.60	1.70	1.70	1.60@ 1.80
Clearfield mine run.....	Boston.....		2.35	1.85	1.90	1.45@ 2.35	Ind. 5th Vein lump.....	Chicago.....		2.85	2.35	2.35	2.25@ 2.50
Cambria mine run.....	Boston.....		2.85	2.30	2.30	2.00@ 2.50	Ind. 5th Vein mine run.....	Chicago.....		2.10	2.10	2.10	2.00@ 2.25
Somerset mine run.....	Boston.....		2.60	2.00	2.05	1.75@ 2.40	Ind. 5th Vein screenings....	Chicago.....		1.45	1.55	1.55	1.50@ 1.65
Pool 1 (Navy Standard)....	New York....		3.25	2.70	2.70	2.25@ 2.35	Mt. Olive lump.....	St. Louis....		3.00	2.85	2.85	2.75@ 3.00
Pool 1 (Navy Standard)....	Philadelphia..		3.45	2.80	2.80	2.60@ 3.00	Mt. Olive mine run.....	St. Louis....		2.00	2.50	2.50	2.50
Pool 1 (Navy Standard)....	Baltimore....		2.45	2.05	2.05	1.90@ 2.25	Mt. Olive screenings....	St. Louis....		1.50	2.00	2.00	2.00
Pool 9 (Super. Low Vol.)...	New York....		2.75	2.15	2.15	1.95@ 2.35	Standard lump.....	St. Louis....		2.40	2.15	2.15	2.00@ 2.35
Pool 9 (Super. Low Vol.)...	Philadelphia..		2.50	1.95	1.95	1.90@ 2.00	Standard mine run.....	St. Louis....		1.85	1.80	1.80	1.75@ 1.85
Pool 9 (Super. Low Vol.)...	Baltimore....		2.25	1.80	1.80	1.90@ 2.00	Standard screenings.....	St. Louis....		1.05	1.45	1.20	1.15@ 1.25
Pool 10 (H.Gr. Low Vol.)...	New York....		2.30	1.75	1.75	1.65@ 1.90	West Ky. lump.....	Louisville...		2.30	2.10	2.10	2.00@ 2.25
Pool 10 (H.Gr. Low Vol.)...	Philadelphia..		2.25	1.70	1.70	1.65@ 1.75	West Ky. mine run.....	Louisville...		1.65	1.60	1.55	1.40@ 1.85
Pool 10 (H.Gr. Low Vol.)...	Baltimore....		1.80	1.55	1.50	1.50@ 1.75	West Ky. screenings....	Louisville...		1.05	1.15	1.15	1.10@ 1.25
Pool 11 (Low Vol.).....	New York....		1.96	1.45	1.45	1.35@ 1.60	West Ky. lump.....	Chicago.....		2.10	2.05	2.05	1.90@ 2.25
Pool 11 (Low Vol.).....	Philadelphia..		2.05	1.55	1.55	1.50@ 1.60	West Ky. mine run.....	Chicago.....		1.30	1.60	1.60	1.50@ 1.75
Pool 11 (Low Vol.).....	Baltimore....												
High-Volatile, Eastern							South and Southwest						
Pool 54-64 (Gas and St.)...	New York....		1.75	1.50	1.50	1.35@ 1.65	Big Seam lump.....	Birmingham..		3.50	3.20	3.40	3.30@ 3.50
Pool 54-64 (Gas and St.)...	Philadelphia..		1.85	1.50	1.50	1.40@ 1.60	Big Seam mine run.....	Birmingham..		2.00	1.75	1.75	1.50@ 2.00
Pool 54-64 (Gas and St.)...	Baltimore....		1.75	1.45	1.45	1.40@ 1.50	Big Seam (washed).....	Birmingham..		2.35	2.00	2.00	1.75@ 2.25
Pittsburgh sc'd gas.....	Pittsburgh...		2.65	2.40	2.40	2.30@ 2.50	S. E. Ky. lump.....	Chicago.....		3.10	2.10	2.10	2.00@ 2.25
Pittsburgh gas mine run.....	Pittsburgh...		2.05	1.85	1.85	1.75@ 2.00	S. E. Ky. mine run.....	Chicago.....		1.80	1.50	1.50	1.25@ 1.75
Pittsburgh mine run (St.)...	Pittsburgh...		1.55	1.20	1.30	1.25@ 1.40	S. E. Ky. lump.....	Louisville...		2.85	2.10	2.10	2.00@ 2.25
Pittsburgh slack (Gas)....	Pittsburgh...		3.00	2.10	2.10	2.00@ 2.25	S. E. Ky. mine run.....	Louisville...		1.75	1.55	1.55	1.35@ 1.75
Kanawha lump.....	Columbus....		1.85	1.45	1.45	1.30@ 1.55	S. E. Ky. screenings....	Louisville...		1.00	.95	.95	.85@ 1.10
Kanawha mine run.....	Columbus....		1.05	1.10	1.05	1.00@ 1.15	S. E. Ky. lump.....	Cincinnati...		3.10	2.25	2.35	2.25@ 2.50
Kanawha screenings.....	Cincinnati...		3.00	2.10	2.25	2.00@ 2.50	S. E. Ky. mine run.....	Cincinnati...		1.60	1.50	1.45	1.25@ 1.65
W. Va. lump.....	Cincinnati...		1.60	1.40	1.35	1.35@ 1.60	S. E. Ky. screenings....	Cincinnati...		1.10	.90	.90	.85@ 1.10
W. Va. gas mine run.....	Cincinnati...		1.60	1.40	1.35	1.35@ 1.60	Kansas lump.....	Kansas City..		4.00	4.50	4.50	4.50
W. Va. steam mine run.....	Cincinnati...		1.05	.85	.90	.75@ 1.00	Kansas mine run.....	Kansas City..		3.25	3.50	3.50	3.50
W. Va. screenings.....	Columbus....		2.75	2.45	2.45	2.25@ 2.65	Kansas screenings....	Kansas City..		2.60	2.00	2.50	2.50
Hooking lump.....	Columbus....		1.85	1.70	1.55	1.45@ 1.65							
Hooking mine run.....	Columbus....		1.10	1.15	1.05	1.00@ 1.15							
Hooking screenings.....	Columbus....		2.55	2.40	2.40	2.00@ 2.85							
Pitts. No. 8 lump.....	Cleveland...		2.05	1.35	1.85	1.80@ 1.90							
Pitts. No. 8 mine run.....	Cleveland...		1.25	1.05	1.10	1.10@ 1.30							
Pitts. No. 8 screenings....	Cleveland...												
* Gross tons, f.o.b. vessel, Hampton Roads.													
† Advances over previous week shown in heavy type, declines in italics.													

\* Gross tons, f.o.b. vessel, Hampton Roads.

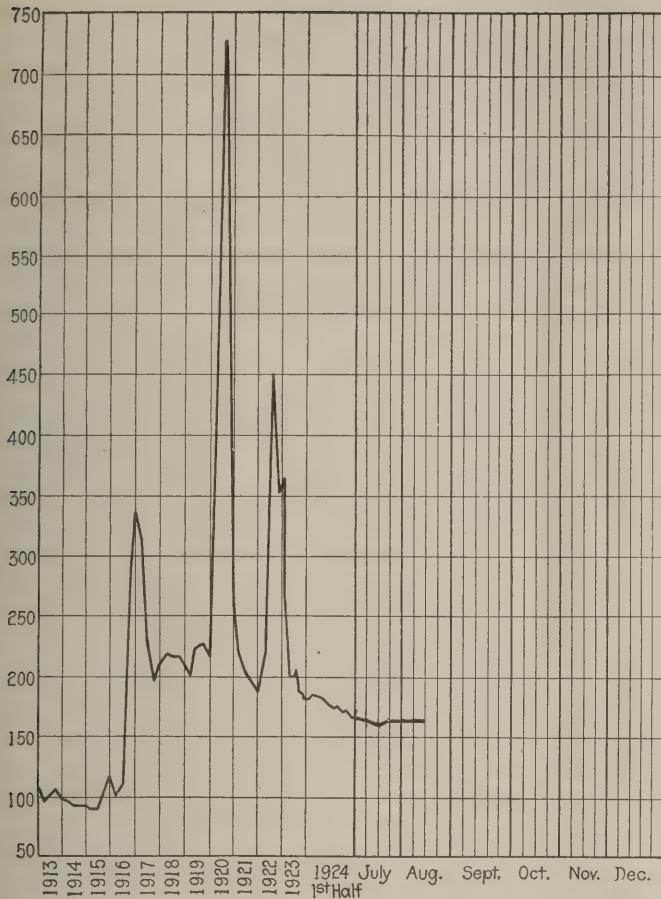
† Advances over previous week shown in heavy type, declines in italics.

### Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

Broken		Market Quoted	Freight Rates	August 13, 1923	August 4, 1924	August 11, 1924†
Broken.....	New York.....		\$2.34		\$7.75@ \$8.35	
Broken.....	Philadelphia..		2.39		7.90@ 8.10	
Egg.....	New York.....		2.34	\$8.50@ \$13.00	8.00@ 8.35	8.50@ \$9.05
Egg.....	Philadelphia..		2.39	9.25@ 11.00	8.10@ 8.35	8.65@ 9.05
Egg.....	Chicago.....		5.06	8.50@ 12.00	7.25@ 7.45	9.00@ 9.70
Stove.....	New York.....		2.34	8.50@ 13.25	8.00@ 8.35	8.10@ 8.25
Stove.....	Philadelphia..		2.39	9.25@ 11.00	8.15@ 8.35	8.02@ 8.12
Stove.....	Chicago.....		5.06	8.50@ 12.00	7.25@ 7.45	9.00@ 9.25
Chestnut.....	New York.....		2.34	8.50@ 13.00	8.00@ 8.35	9.35@ 10.00
Chestnut.....	Philadelphia..		2.39	9.25@ 11.00	8.15@ 8.35	9.05@ 9.10
Chestnut.....	Chicago.....		5.06	8.50@ 12.00	7.25@ 7.45	9.35@ 10.00
Range.....	New York.....		2.34		8.30	8.40@ 8.60
Pea.....	New York.....		2.22	6.75@ 8.50	6.00@ 6.30	8.30@ 8.55
Pea.....	Philadelphia..		2.14	7.00@ 7.50	6.15@ 6.20	8.85@ 9.05
Pea.....	Chicago.....		4.79	7.00@ 8.50	5.30@ 5.65	9.00@ 9.05
Buckwheat No. 1.....	New York.....		2.22	3.00@ 3.50	3.50@ 4.15	8.20@ 8.32
Buckwheat No. 1.....	Philadelphia..		2.14			8.24@ 8.38
Rice.....	New York.....		2.22	3.50	3.50	8.90
Rice.....	Philadelphia..		2.14	2.25@ 2.50	2.50	8.90
Barley.....	New York.....		2.22	2.50	2.50	5.50@ 6.00
Barley.....	Philadelphia..		2.14	1.25@ 1.50	1.50	5.75@ 6.00
Birdseye.....	New York.....		2.22	1.50	1.50	5.36@ 5.91
						5.15@ 5.60
						1.75@ 2.50
						2.50@ 3.00
						1.50@ 2.00
						2.00@ 2.25
						2.25
						1.15@ 1.40
						1.50
						1.60

\* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.





Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

	1924			1923
	Aug. 11	Aug. 4	July 28	Aug. 13
Index	163	163	163	196
Weighted average price	\$1.98	\$1.98	\$1.98	\$2.37

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board.

not want to tie up capital in stock. A lot of retailers are unable to see anything in sight that can force the market up.

Slightly firmer prices on 6-in. block coal and improved demand for prepared sizes marked the week in Western Kentucky. Some operators are now quoting a low of \$2.25 on block, and as high as \$2.50, as against a market of \$2.15-\$2.35 a week ago, although some block can probably be had at right around \$2. Egg, lump and nut prices are unchanged. Illinois Central R.R. mines favored by railroad buying, and fair movement of mine run, have been asking as much as \$1.85 for good qualities, but some strip pit coal, and off-grade stuff in the field can be had at \$1.40 and probably less.

### Northwest Has One Bright Spot

Everything is better at Duluth than at last writing, with trade brightening, more shipments going out from the docks and prices firmer. There has been no change in prices during the past week, but it is expected by the dock men that an increase will take place within a short time in bituminous coal if trade continues active.

The Twin Cities are awaiting the harvesting of the crop before purchasing anything. Both consumers and dealers have thus far bought much less coal than they should.

Dock receipts have been much less than a year ago, but the dock men carried over so much coal that they have about as much on hand as they had a year ago. They do not want any excessive tonnage and hope producers will not load them excessively.

August weather is not conducive to coal buying, never-

theless Milwaukee dealers say there is a slight improvement in the demand. The demand is bound to increase, now that the fall months are approaching. A general revision of prices of soft coal is anticipated Sept. 1, in addition to the final increase of 10c. per ton on anthracite. Cargo receipts to date aggregate 405,438 tons of anthracite, and 1,022,088 tons of soft coal.

### Southwest Made Stumbling Start

A few weeks ago Southwestern operators, encouraged by a steadily strengthening demand, thought they saw an early fall market. Since, the market has weakened until in the early days of August less business was done than in the same period of June. Some operators, who had announced their intention to advance their quotations on Arkansas semi-anthracite Aug. 1, were deterred by the decline. Schools have begun to store for winter and there still is a light demand for threshing, but, with the exception of the normal industrial contract market, this is the extent of demand. Henryetta, Okla., coal is \$4.50 for lump, \$4 for nut, \$3.75 for mine run and \$2 for screenings. Arkansas semi-anthracite is quoted from \$5.50 to \$7 for lump, \$3.50 to \$4 for mine run and \$2 for screenings.

In Colorado the sales of domestic coal improved a little last week. Storage orders are beginning to come in but only slowly. Although conditions are far from encouraging and normal, operators are fairly optimistic for they are expecting to have a busy month. Mines worked on an average of twenty hours with 49 per cent of the working time lost attributed to lack of market.

### Cincinnati Better but Doesn't Know It

In Cincinnati the trade spirit has sunk to the lowest ebb in years, the weather probably being the cause. The buyers' market still continues with scarcely an item in the whole list being actively sold. Yet production has shown an upward trend. The figures of J. A. Morris, in charge of car interchange for the West Virginia-Kentucky coal section under the American Railway Association, shows 9,849 loaded cars passed north at the gateways under his jurisdiction, an increase of 402 cars over the previous week. Lake movement is still low, the number of cars due there being 21 less than during the preceding week.

Run-of-mine prices have stiffened again. Buyers find that \$1.40 is about the lowest price at which good coal can be obtained. Some steam stuff is still obtainable around \$1.25, the malleables and byproduct coals run higher, some quotations being as high as \$1.65-\$1.75. Domestic business is "shot" and the slack turnover is about grooved at 75c.-\$1.10.

In smokeless there is little disposition on the part of the standard Pocahontas producers to slice the price named by the circular. Some New River prepared in lump and egg can be had around \$3.75, though seemingly there is an absence of the \$3.50 coal that could be had last week. The screenings are draggy, the asked price running \$1.25-\$1.50, and where large tonnages are involved the price is shaded. Specialized coals are selling: Egg \$2-\$2.60; lump \$3-\$3.50.

In a retail way there was a fairly healthy swing into August, with prices lined up this way: Pocahontas lump \$8, run of mine \$5.50-\$6, bituminous lump \$6.25-\$6.50, slack \$3.50-\$5.50.

Better feeling is developing in Columbus and central Ohio territory. Buying of domestic sizes has increased slightly and producers as well as jobbers believe that a much stronger demand will soon come from retailers. Retail prices are fairly steady at the levels which have prevailed for some time.

Steam trade is still dull and there are no indications of improvement. Railroad requisitions are not especially large. Iron and steel plants are only buying what is needed and there is no general movement to stock up. Utilities are the best customers. School coal is moving in large quantities and municipalities are also placing orders.

A seemingly stronger demand for slack and screenings has stiffened the spot prices of these grades in eastern Ohio from 5 to 20c. per ton. Less slack is available for the Lake shipping from No. 8 field has demanded less lump than usual and consequently the mines did not produce the slack. The market for Lake cargo coal is very quiet.

In other ways also, the general tone in the coal trade is better, but appreciable improvement is, of course, being



retarded by the general depression. During the week ended Aug. 2, the No. 8 field of eastern Ohio produced 266,000 tons, or about 38 per cent of the estimated capacity of the field for the week. This was 11,000 tons under the output of the preceding week and 161,000 tons under the corresponding week of last year.

The Geological Survey reports continue to show increased shipments of coal from the general Pittsburgh district, say a 30 per cent operation against about 20 per cent in April and May. The trading market in coal does not reflect any such increased activity, though it is now probably a little less dull than in April. Such increases as there have been in shipments probably have been due chiefly to heavier movement between operators and regular customers, those who ordinarily have contracts for the coal year, but now simply take shipments as they need them and adjust the price periodically.

The bituminous coal trade in Buffalo is quieter than ever. Only the slow condition of other branches of trade keeps some dealers from giving up their coal business altogether. They are beginning to fear the old bituminous-coal market in Buffalo is weakened forever, the non-union fields ousting the union and going to the consumer by other routes.

### New England Prices Stiffening

The bituminous situation in New England has improved a little during the past week. Actual purchases have not been any larger—in fact total sales are probably slightly less owing to decreased activity due to hot weather—but the sentiment is better. Many consumers, some of them large, have announced that they must come into the market shortly.

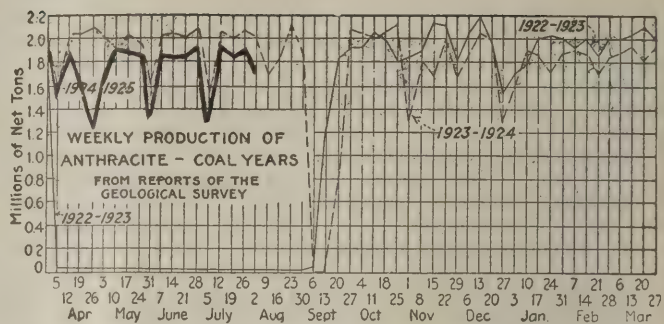
Prices have assumed a healthier tendency during the last day or two. Offerings of good low-volatile smokeless are less frequent at \$5.40 gross ton on cars, Boston, the going figure last week. Where this price was acceptable a week ago \$5.45 is now the bottom, and certain shippers here who sell on a guaranteed analysis hold firmly for \$5.50 on cars whether one car or a dozen is ordered. This firmer tendency follows news of a decline in tonnage at southern loading ports which is expected to be reflected shortly in spot f.o.b. prices.

The industrial situation has taken a turn for the better. Shoe factories and textile mills have greatly increased their running time. Water is low, and coal must be used for steam making. Pennsylvania still finds a narrow market, due to the margin in favor of landed tidewater coal prices. Coal has been shipped from Boston to a fairly northern Vermont point that is normally all-rail territory, at a landed cost over 25c. per ton lower than that of a like quality Pennsylvania coal. Sales of Pennsylvania coal are largely confined to retailers and consumers who desire lumpier coal than New River.

### Atlantic Seaboard Situation Improving

In the New York bituminous market many wholesalers report improvement. More inquiries are reported and a greater demand for tonnage, though, of course, a number of unfavorable factors continue and certain unethical practices are uncovered from time to time, such as operators quoting lower prices to consumers than to wholesalers which, of course, makes an unfavorable impression on those who have so often borne a burden on behalf of the operating interests. There is as yet no change of consequence in prices and little is anticipated in the near future.

At Philadelphia the soft-coal trade is as inactive as last



week, but the iron and steel trade shows signs of distinct betterment, with some plants already operating on a larger scale and others preparing for increased activity. As yet the buyers for these concerns are proceeding cautiously in their coal purchases and as a result the coal market has not felt any impetus.

Business is dull in Baltimore. The failure of the early August market to strengthen is reflected in price quotations, which are about the same as they have been for the past several weeks. Exports for the first eight days of August show a decided falling off as compared with the same period of July.

A better feeling prevails in the Birmingham trade, a more active demand for coal being exhibited than for several months past. Contracts have been made by consumers who for some time have been supplied from the spot market. A little more spot business was booked than in the previous week, and bunker demand was slightly better. Small towns and community centers are placing orders for domestic coal in one- and two-car lots. Further wage reductions are reported at some commercial and domestic operations.

### Some Anthracite Mines on Short Time

In New York traders in anthracite feel much encouraged by the increased number of inquiries of the past week. So confident is the belief in approaching better conditions that middle-houses are limiting their commitments, not caring to have too much business booked at present prices.

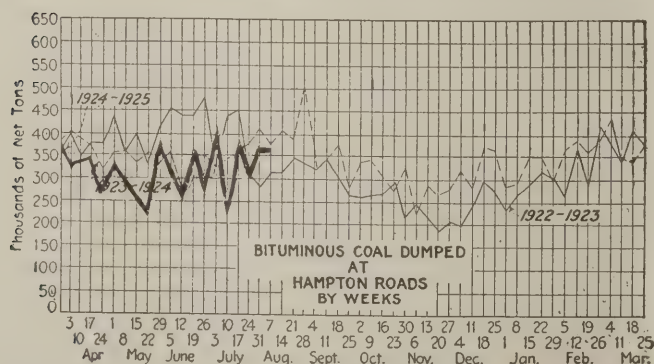
Stove coal continues strong, and egg, as usual, is in second place as regards demand, nevertheless it is holding up remarkably well. Chestnut moves sluggishly, but the revival in the western trade is expected to cure this. Buckwheat and rice are in a somewhat better condition. Barley also has been moving well considering the low price of bituminous coal with which it has to contend.

The demand for anthracite in Philadelphia is so light that some operators last week put their mines on a four-day schedule. This plan will be followed in the coming week. In consequence no large-sized coal will be stored by the producer for winter demand. The only size the retailers want is stove, and they are content to wait till it comes. A small tonnage of nut and pea are sold occasionally at reduced prices with \$8.75 and \$5.25 as their respective prices. Steam coals are rapidly accumulating. The independents are known to be moving some of their surplus buckwheat at \$2 to \$2.25 with proportional cuts on rice, although barley is not so difficult to sell.

Despite the effort to get their customers to buy by prophecies that coal will advance at retail 25c. per ton on the first of September, Baltimore retailers are finding trade extremely light. In New England the retail anthracite demand shows further contraction and the wholesale market is dull with marked irregularity in independent prices.

The Buffalo anthracite trade is slow. Anthracite which gained when the natural-gas flow began to subside is losing business now to the gas from big byproduct ovens.

The Connellsville coke market continues dull. The decrease in blast-furnace activity practically ended several weeks ago, and coke production has lately been closely adjusted to requirements, so that there is neither distress coke seeking sale nor consumers seeking extra tonnages. The furnace coke market has been quotable at \$3 for several weeks. Foundry coke remains at \$4 to \$4.50, to which it recently declined. Demand if anything is a shade lighter than a fortnight ago. Heating coke remains quotable at around \$2.60 to \$2.75, with good medium sulphur coke, for non-ferrous use, at say \$2.75 to \$2.85.





# Foreign Market And Export News

## Coal Trade in Great Britain More Depressed than Ever

The Welsh steam coal market is inactive and depressed, and, though a number of pits have been closed down, production is still ahead of demand. With few exceptions the collieries are accumulating stocks, and notices to terminate contracts have been given at several collieries affecting about 6,000 miners. The threat of the Miners' Federation to strike in the Rhondda No. 1 District on the non-unionist question appears to have been effective, as nearly every non-unionist has been brought in.

Business all round is poor, and prices show a tendency to decline still further. European business is well below the average, France and Italy taking very little coal of any sort. Only occasional orders come from Belgium and Germany.

The Newcastle market is also depressed, inquiry is slow and small in volume, and many of the pits are finding it difficult to keep going steadily. The industrial demand is at a low ebb, though operators are hoping for a revival in gas coal contracts on account of storage for the winter. The Palermo gasworks have contracted for the supply of about 12,000 tons of gas coals for delivery during August and September.

Production by British collieries during the week ended July 26, according to a cable to *Coal Age*, totalled 4,489,000 tons, compared with 4,904,000 during the week ended July 19.

### France Has Shortage of Domestic Coal

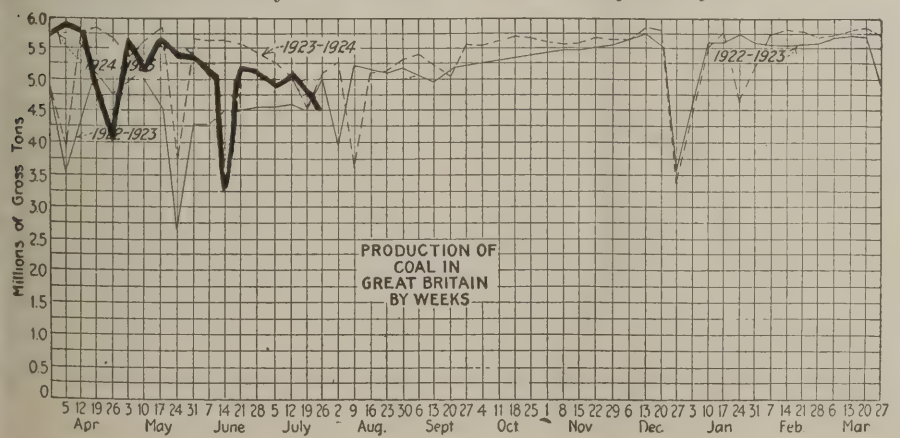
Industrial coals are inactive with increasing tonnages offered. On the other hand there is a shortage of domestic coal and consequently a market favorable to the coal operator. The coal companies are behind with their orders and in cases were shipping coal in the end of July that they should have forwarded in May. In British

coals, transactions are relatively slow. It is reported that large French purchasers have recently been concluding contracts for British coals with deferred

### French Imports and Exports of Fuels During May and June, 1924

IMPORTS		EXPORTS	
May	June	May	June
Metric	Metric	Metric	Metric
Tons	Tons	Tons	Tons
COAL			
529,075	505,294	Sarre.....	67,218
1,459,341	912,443	Great Britain.....	45,555
180,041	177,428	Belgium.....	10,257
		Luxemb.....	161
64,957	22,065	United States.....	60
313,907	154,621	Germany.....	13,027
2,912	2	Spain.....	37,177
44,340	38,462	Holland.....	1,273
		Switzerland.....	783
309	65	Italy.....	
		Other countries... ..	11,178
		Bunkers (French s/s).....	8,218
		(Foreign s/s).....	67,300
			38,218
			797
			5,467
2,594,882	1,810,380		171,211
			142,300
COKE			
20,520	1,096	Great Britain.....	
33,677	3,474	Sarre.....	
	35,376	Belgium.....	
	29,920	Luxemb.....	
428,060	397,569	Holland.....	
	6,593	Germany.....	
		United States.....	
		Switzerland.....	5,099
		Spain.....	5,682
		Italy.....	194
39,031	0	Other countries... ..	304
			12,043
			14,729
			14,826
521,888	474,028		13,719
			32,162
			34,434
PATENT FUEL			
15,979	11,517	Great-Britain.....	
30,790	33,956	Belgium.....	
		Luxemb.....	
30,023	30,040	Germany.....	
307	378	Switzerland.....	10,540
		Other countries... ..	6,766
		Bunkers (French s/s).....	400
		(Foreign s/s).....	4,825
			577
			703
			4
			154
77,099	75,891		11,521
			12,448

deliveries. For instance, the Midi Railway Co. has, it is said, just purchased Durham coking coals that are to be delivered early next year.



On the other hand, in French channel ports no British coal has been received by central stations for two months. No complaints have been heard this week relative to the lack of rolling stock.

From July 1 up to July 15, France and Luxembourg received from the Ruhr 206,100 tons of coal, 282,900 tons of coke and 11,300 tons of lignite briquets or a total of 500,300 metric tons. In the Ruhr the increase in the length of the working day has increased production, but sales are not responding to that increase as German coal prices in gold marks are still too high. Idle days are contemplated in the Ruhr.

### Export Clearances, Week Ended Aug. 9, 1924

FROM HAMPTON ROADS		
For Italy:		Tons
Ital. Str. Tirso, for Genoa.....		7,452
Ital. Str. Adige, for Genoa.....		9,380
For Canada:		
Ital. Str. Armando, for Montreal.....		7,154
For Danish West Indies:		
Dutch Str. Peursum, for Curacao.....		2,896
For France:		
Ital. Str. Mazanillo, for Marseilles.....		5,007
For Cuba:		
Am. Sch. Mary H. Diebold, for Cienfuegos.....		2,332
Am. Sch. Lillian E. Kerr, for Santa Cruz del Sur		796
For Brazil:		
Gr. Str. Andreas, for Rio de Janeiro.....		7,853
FROM BALTIMORE		
For France:		
Fr. Str. Lieut. Jean Laurent.....		8,234
For Italy:		
Ital. Str. Aster.....		8,951
For Porto Rico:		
Am. Str. Governor John Lind.....		387
FROM PHILADELPHIA		
For Cuba:		
Nor. Str. Tela, for Havana.....		
Nor. Str. Frieda, for Havana.....		
Hampton Roads Pier Situation		
N. & W. Piers, Lamberts Pt.:	July 31	Aug. 6
Cars on hand.....	1,812	1,761
Tons on hand.....	107,606	105,404
Tons dumped for week.....	107,939	122,403
Tonnage waiting.....	5,000	25,000
Virginian Piers, Sewalls Pt.:		
Cars on hand.....	1,296	1,118
Tons on hand.....	90,950	80,700
Tons dumped during week.....	106,858	94,411
Tonnage waiting.....	5,111	2,250
C. & O. Piers, Newport News:		
Cars on hand.....	1,928	1,526
Tons on hand.....	77,884	80,333
Tons dumped for week.....	108,415	103,640
Tonnage waiting.....	11,330	9,20

### Pier and Bunker Prices, Gross Tons

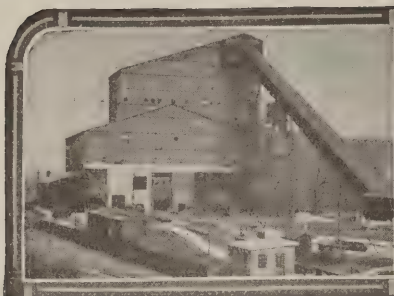
PIERS		Aug. 2		Aug. 9†	
Pool 9, New York.....	\$4.75@	\$5.00	\$5.25@	\$5.40	
Pool 10, New York.....	4.50@	4.75	4.25@	4.60	
Pool 11, New York.....	4.25@	4.50	4.00@	4.15	
Pool 9, Philadelphia.....	4.70@	5.00	4.70@	5.00	
Pool 10, Philadelphia.....	4.45@	4.70	4.45@	4.70	
Pool 11, Philadelphia.....	4.30@	4.50	4.30@	4.50	
Pool 1, Hamp. Roads.....	4.15		4.15		
Pool 2, Hamp. Roads.....	4.05		4.05		
Pools 5-6-7 Hamp. Rds.	4.00		4.00		
BUNKERS		Aug. 2		Aug. 9†	
Pool 9, New York.....	5.00@	5.25	5.00@	5.25	
Pool 10, New York.....	4.75@	5.00	4.75@	5.00	
Pool 11, New York.....	4.50@	4.75	4.50@	4.75	
Pool 9, Philadelphia.....	5.00@	5.30	5.00@	5.30	
Pool 10, Philadelphia.....	4.75@	4.95	4.75@	4.95	
Pool 11, Philadelphia.....	4.50@	4.70	4.50@	4.70	
Pool 1, Hamp. Roads.....	4.20		4.20		
Pool 2, Hamp. Roads.....	4.10		4.10		
Pools 5-6-7 Hamp. Rds.	4.00		4.00		

### Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations by Cable to <i>Coal Age</i>		Aug. 2		Aug. 9†	
Admiralty, large.	28s. 6d.	29s.	28s. 6d.	28s. 6d.	
Steam smalls.....	16s. 6d.			17s.	
Newcastle:					
Best steams.....	20s. 3d.	20s. 6d.		21s.	
Best gas.....	22s. 6d.			23s.	
Best bunkers.....	20s.			20s.	

† Advances over previous week shown in heavy type, declines in italics.





## News Items From Field and Trade



### ALABAMA

Suit for \$100,000 has been filed by C. L. Moss and G. B. McCormack, Jr., as individuals, and as Moss & McCormack against the Jagger Coal Co., John Gray and E. P. Rosamond, Jr., as damages for alleged conversion of coal.

At the sitting of the board of mine examiners held in the offices of Chief Inspector C. H. Nesbitt, July 21-24, fifty-seven applicants took the examination for certificates as first and second class mine foremen and fire boss, thirty-six of whom qualified.

A. F. Harper has been appointed superintendent-resident engineer at the Flat Top mines of the Sloss Sheffield Steel & Iron Co., succeeding J. W. Turner, who will be in charge of the mine operations for the State at this operation, which is worked by convicts under lease by the State.

The Newcastle Coal Co. has leased a number of its idle beehive ovens at Newcastle to the Black Creek Coal & Coke Co., which will use these ovens in coking coal from its Thermal mines now being developed a short distance from Newcastle. The Black Creek Coal & Coke Co. is building a large coal washery and installing other modern equipment for the mining and preparation of coal at its new operation and it is understood contemplates building of byproduct ovens in the future. The Newcastle Coal Co. has 374 beehive ovens, only a portion of which is required to care for the coal taken out at Newcastle mines.

Walter Moore and associates, operating the Pratt Fuel Corp., have acquired the properties of the Jagger Coal Co., in Walker County, near Nauvoo, Ala., which consists of about 2,500 acres of coal lands, carrying the Mary Lee, Jagger and Black Creek seams of coal, developments consisting of two mines and a stripping operation, the consideration involved being reported about \$350,000 cash. With this addition to the holdings controlled by the Pratt Fuel Corporation, it is stated that an annual output of 1,000,000 tons may be acquired should market conditions warrant such a production. Head offices of the Pratt Fuel Corporation are in Birmingham.

### ILLINOIS

"Educate them; make them better labor-movement men," is the idea behind a system of schooling for miners which is going into effect in Subdistrict 5 of the Illinois Mine Workers, in and around Taylorville. The

subdistrict organization has employed Tom Tippet, a well-known Middle Western writer for the Federated Press, a radical labor news service, to lay out a course in history, economics and public speaking. Classes have been organized at ten points with enrolments running up as high as 100. Tippet tours these towns conducting the classes, each of which meets once every two weeks. Later other instructors may be used. William A. Daech, subdistrict president, denies that it is a communist movement.

### INDIANA

Records of the Indiana State Board of Accounts show that Cairy Littlejohn, chief mine inspector and A. C. Daly, deputy inspector of Indiana have returned to the State Treasury amounts charged in excess of payments recorded at the hotels at which they had stayed.

Approximately 600 miners returned to work in the Indiana field this week after about three months' idleness, when three of the larger mines, the Knox mine in the Bicknell field, the Newport mine in the North Clinton field, and the Submarine mine in the Terre Haute field, resumed operations.

Co-operative mining, long a problem for the United Mine Workers of America in district No. 11, has appeared again in the Jasonville-Linton field. John Hessler, district president of Indiana says: "The co-operative mining venture at the Liberty mine, south of Jasonville, sometimes called Briar Hill, and the Keystone mine at Linton have been under investigation by the district executive board for some time." The local unions at each of those mines have been advised that unless they comply with the decision of the executive board, action will be taken against the charter of the local union."

### KENTUCKY

John Drew, a 15-year old boy employed in the plant of the Elkhorn Coal Co., near Kona Station, in Letcher County, Ky., was beheaded when caught in the blades of a large metal exhaust fan on Aug. 2.

A report from Harlem, Ky., on Aug. 5, stated that the Wallins Creek Collieries Co. had laid off 200 men and closed down because it was unable to obtain a reduction in the wage scale. It is alleged that the company signed up a four-year agreement on April 1, but later found that lower scales had been granted in agreements with other companies in the same district, which

was not in accordance with the terms of its agreement. It asked for a concession, and was refused.

It is reported from McRoberts, Ky., that, on July 26, a short circuit in Mine No. 210, Consolidation Coal Co., at McRoberts, caused a fire, which spread rapidly damaging much equipment before being brought under control. A slate fall broke electric wires and caused the fire.

A ten million dollar first mortgage is reported as filed in Madisonville in favor of the Bank of North America & Trust Co., Philadelphia, July 27, the mortgage being given by the West Kentucky Coal Co., and covering mining properties, mines and equipment, in Hopkins, Webster, Union and Crittenden County, and yards, etc., at Paducah, Louisville, Memphis, Nashville and elsewhere, including the mines recently purchased from the St. Bernard Mining Co.

Fred M. Sackett of the Sackett-Speed interests, Louisville, operating coal mines in both eastern and western Kentucky, the Byrne & Speed Coal Co., jobbers and retailers, and large cement, lime and quarry plants, on Aug. 2 received the Republican nomination for U. S. Senator by a majority of over 30,000. Sackett is popular, and a strong fighter for his state. He has served three terms as president of the board of trade, and was State Food Administrator during the war.

Frank D. Rash, of Earlington, Ky., former president of the St. Bernard Mining Co., and now vice-president of the West Kentucky Coal Co., was elected State Commander of the American Legion of Kentucky at the sixth annual convention at Bardstown, Ky., on July 26.

### OHIO

A mine of the Essex Coal Co., in the Hocking Valley, has been down for several weeks owing to a local strike which has not yet been settled. The curtailment in the company's output was approximately 5,000 tons weekly.

Bids were received by the Board of Purchase, July 30, for delivering 19,500 tons of coal to the various Columbus city institutions. W. S. Harmon, Columbus, was granted the contract for 7,000 tons of nut, pea and slack to the waterworks department on his bid of \$1.14 f.o.b. mines. On the same figure, he will furnish 3,500 tons to the garbage disposal plant. The Jay Miller Coal Co., Columbus, will deliver 9,000 tons of nut, pea and slack to the municipal light plant on a bid of \$1.25 f.o.b. mines.

Though it is still too early to fore-



cast the effect on production in the southern Ohio field of the new wage agreement signed at Logan recently, operators in that field believe it will be of considerable benefit. One of the principal advantages is the agreement on measures which will insure the production of clean coal. Another is the adoption of the eastern Ohio scale on dead work which is now on a yardage basis instead of by day labor. The price is approximately 10c. per yard.

Owing to the dullness of the coal demand both the subsidiaries of the Hysylvania Coal Co., of Columbus, viz; the Piney Fork Coal Co., and the Panhandle Collieries Co., located in No. 8 field, have been closed down.

The Kinwood Coal Co., Columbus, operating in the Jackson field on the Pomeroy division of the Hocking Valley R.R., is making extensive improvements during a temporary shutdown. An extra man exit is being constructed between the two beds which are 18 ft. apart, and both under operation. The new opening is made in case of accident. Steps will be taken soon to install an additional fan for ventilation.

Columbus operators were advised recently that the Hocking Valley R.R. had cleared up the congestion of 5,000 loaded cars of coal on the line between Columbus and Toledo, and that the temporary embargo placed last week has been lifted. Ample boats are now being provided at Toledo to handle all coal which passes over the docks. Little Ohio coal, however, is going up the lakes at this time, but much coal is passing through Columbus from ten union mines of West Virginia and Kentucky to the docks at Toledo and Sandusky. Reports from the North-west showed that coal is moving off the docks more slowly than usual at this season of the year.

## PENNSYLVANIA

The Buckeye Coal Co., a subsidiary of the Youngstown Sheet & Tube Co., is preparing to resume operations at the Nemacolin mine, in Greene County, which has been idle for a few months. The Brier Hill plant, in Fayette County, is still idle.

In front of the Lattimer offices of the North Side Coal Co., near Hazleton, is a unique war memorial to the hero dead consisting of a huge block of coal, weighing between eight and nine tons, mounted on a concrete base and with a bronze tablet on which is the inscription, "In memory of Employees of Pardee Brothers & Co., Inc., World War, 1917-1918. John W. Crooks, of Lattimer, general manager of Pardee Brothers, is the originator of the memorial.

The Lehigh Valley R.R., in addition to improving its coal-classification yards at Delano, is busy making two improvements at the Coxton yards, near Pittston, with a view to preparing for much heavier coal traffic in the future.

With the invention of a new drill, James G. Morgan, of Wilkes-Barre,



Courtesy U. S. Distributing Corp.

### Coal Pocket on Hudson River

The property of the West New York Coal Co., an auxiliary of Pattison & Bowns. This is located at Weehawken, N. J.

claims to have tripled the efficiency of a blast of powder. The bit in the drill is capable of expansion after it has penetrated into the wall, the end of the hole thus being enlarged. Several mining men have examined and seen demonstration of the drill and pronounce it a forward step in mining.

The C. M. Dodson Coal Co. has started stripping operations at Beaver Brook. It is expected that coal will be reached before the winter ties up the clay work. The company has been stripping considerable areas at Beaver Brook and a large part of the anthracite output from that section is the result of daylight mining.

The tax on undeveloped anthracite lands gradually is forcing the concentration of the industry. John H. Fetting, assistant director of the legislative reference bureau, declared the tax laws are "sadly in need of revision and codification," but emphasized the fact that any revision involves a study of more than thirty special funds of the commonwealth. He pointed out that special funds are expended under a blanket appropriation and preclude proper budgeting and control of expenditures.

Forty members of local union, No. 1036, United Mine Workers of America, of Moosic, are facing suspension from the union as the result of their refusal to pay a 25c. assessment levied by the district organization upon all of the workers in the field for the relief of idle miners.

At the staff dinner of the Peabody Coal Co., Du Bois, Pa., Charles O'Neill of Altoona, secretary of the Central Pennsylvania Coal Producers' Association, said that central Pennsylvania produced 8.5 per cent of the whole output of the United States during the first six months of this year. Pennsylvania's production has dropped from 38 per cent of the output of the United States till it is now from 25 to 30 per

cent of that production, whereas West Virginia's output has increased from 6.5 per cent to 20 per cent of the whole output of the United States. The central Pennsylvania district, he said, has decreased its production from approximately 14.5 per cent in 1890 to 8.5 per cent during the first six months of 1924.

Changes in the staff of physicians who handle compensation cases in the Wilkes-Barre and Plymouth district of the Hudson Coal Co. have just been announced. Dr. Charles L. Ashley, of Plymouth has been appointed chief surgeon in the Plymouth division. He succeeds Dr. D. H. Lake, of Kingston, resigned. In the Wilkes-Barre division, Dr. Harry Smith becomes chief surgeon. He takes the place made vacant by the death of Dr. Walter Davis. Dr. Alan Corson, of Parsons and Dr. Leo Mundy, of Wilkes-Barre, are his assistants.

The new fireproof Oak Hill breaker near Minersville was recently put in operation. The old breaker was destroyed several months back. This breaker will use the Chance method of separation.

Judge R. H. Koch gave judgment in favor of William Metcusk who claimed that he was entitled to compensation both for disability and disfigurement as a result of an explosion of gas in the mines of the Philadelphia & Reading Coal & Iron Co. Judge Koch decided that the disfigurement could not be regarded as incidental to the employment.

Five men convicted in the Somerset county court early this year for dynamiting the Baltimore & Ohio R.R. bridge at Jerome Junction and released under bail are now in the Western Penitentiary in Pittsburgh serving their sentences of five to ten years.

A new mine operation near Shamokin will be started shortly on a tract of 190 acres acquired from the J. C. Langdon estate by the Shamokin Coal Co., a new organization. The new company has the following officers: T. H. Boles, New York, the vice-president and general manager of the Lehigh Valley Coal Co., president; S. D. Dimmick, vice-president and general manager of the Glen Alden Coal Co.; C. S. Newhall, Philadelphia, vice-president of the Pennsylvania Company, Jervis Langdon, Elmira, N. Y., P. S. Gardner, New York City, mining engineer, and W. H. Johns, of Wilkes-Barre. The Shamokin company will operate a tract believed to contain 16 beds with 12,000,000 tons of recoverable coal. A first mortgage 6½ per cent bond issue has been offered to the public to raise funds for purchasing and installing new equipment.

## VIRGINIA

The new \$2,000,000 coal pier of the Virginian Ry. at Sewalls Point will be ready for operation Sept. 1, according to an announcement by C. H. Hix, vice-president of the Virginian. The new pier will be electrically operated and will have a number of innovations in coal handling. It will be self-trim-



ming, and its hoist will have a capacity of two cars at a time. In all its facilities the new pier will be one of the most modern in the world.

## WEST VIRGINIA

Bids are being asked by the Chesapeake & Ohio Ry. for building of 1,000 hopper-bottom steel railroad cars. The president, W. L. Harrahan, expects to have some of these ready to help in moving peak traffic in the fall of this year.

Chief Lambie held the third of his series of safety meetings at Beckley, Aug. 1, C. R. Stahl, assistant general manager, E. E. White Coal Co., being chosen chairman. Carl Scholz, vice-president and general manager, Raleigh-Wyoming Coal Co., presented information regarding electric cap lamps.

Officials of the A. L. Black Coal Co. and the Warner Collieries Co. in the Monongalia field will co-operate in further efforts to extinguish a mine fire which has been burning in the Black mine for several years. This fire endangers the holdings of the Warner company which has property on three sides of the Black mine. R. M. Lambie, chief of the department of mines, has recommended sealing and flooding, the stripping of coal in the rear of fire and the erection of a concrete firewall. Previous flooding failed to extinguish the fire owing to old connections with the Warner mine.

C. E. Lawall, assistant professor of mining engineering in the University of West Virginia, at Morgantown, has been designated acting head of the department with rank of associate professor. He will succeed A. C. Callen, now dean of mining at the University of Illinois. Thomas Frazer, formerly with the U. S. Bureau of Mines, and temporarily assigned to the assistant professorship of research work at the University of Illinois will replace C. E. Lawall who has been with the engineering department since 1921. Professor Lawall is a graduate of Lehigh University.

Associated with the West Virginia Coal & Coke Co. of Elkins, W. Va., in the purchase of the Main Island Creek coal mines reported in *Coal Age*, July 31, p. 160, are the Logan Mining Co., the Empire Coal Co. and the Rich Creek Coal Mining Co. It is said that the sales price for the Main Island Creek interests was about \$4,500,000 plus the inventory of the stores, commissaries and a knock-down price on other holdings.

The tippie at the Whiteman mine of the Clarksburg Big Vein Coal Co., a company operating on a non-union basis and employing 60 men, was wrecked Aug. 7 by two explosions. Timbers were hurled more than 300 ft. and nearby homes were shaken. This is the third tippie destroyed in the last few weeks at the non-union mines of Harrison County.

The Crystal Block Coal & Coke Co., Welch, W. Va., has voted to issue \$200,-

000 of preferred stock, to complete the development of a new operation at Stirrat in the Logan field on Main Island Creek, making total capital \$700,000. It will be one of the best operations in southern West Virginia and well equipped with preparation machinery. The company has about 1,300 acres and has already completed work on 34 houses and driven its opening about 600 ft. The company expects to ship coal in small quantity in about two weeks.

## CANADA

It having been alleged by an alderman of the City of Hamilton, Ont., that the municipal coal department conducted by that city this year was incurring heavy loss, the City Clerk has made a statement that up to June 1 a surplus of \$2,300 has been earned.

Archibald McCool, general manager of the British Empire Steel Corporation's operations on the mainland of Nova Scotia, has resigned his position.

The British Empire Steel Corporation has announced a decrease in salaries ranging from 10 to 25 per cent, for executives of the company. Affected are superintendents, engineers, foremen, office managers, purchasing agents, office clerks and shipping department employees, etc. Some of the principal officers have resigned in protest against the cuts. Because of the shutdown of the steel plant at Sydney for three months, a substantial decrease is expected for the next three months in the coal mined in the Cape Breton district.

The Allen mine which was the scene of a disaster on Cape Breton island some months ago, has been closed, apparently for an indefinite period. No repairs are being made. The production of coal by the British Empire Steel Corporation, is about sixty per cent normal. This is attributed to the depression in business. At nearly all the mines are heavy stocks of coal awaiting sales.

## New Companies

Articles of incorporation have been filed in Birmingham by the **Continental Coal Co.**, with a capital stock of \$4,800, all paid in. The company was formed by T. S. Abernathy, G. G. Tait and J. M. Donaldson.

**The Jagger Coal Co.**, Nauvoo, Ala., has filed notice decreasing its capital stock from \$198,000 to \$20,000.

**The Castlegate Fuel Co.** of Salt Lake City has filed incorporation articles. Chas. M. Goddard is president. The capital stock is listed at \$25,000.

**The Mutual Development Co.**, of Pikeville, Ky., for development of coal properties, was recently chartered with a capital of \$75,000, by J. J. Moore, L. H. Moore and Edward Hellier.

**The Northern Alabama Coal Co.**, Jasper, Ala., has filed papers for incorporation permitting it to enter the coal-mining business. The incorporators are Walter Moore, C. P. Moore and Bird Tichenor. The capital stock is \$247,500, only \$2,500 of which is paid in.

**The Peerless Elkhorn Coal Co.**, of Columbus, Ohio, has been incorporated with an authorized capital of \$150,000 to mine and sell coal in the Elkhorn field of Kentucky. Incorporators are F. G. Hatton, E. Hauck, Ralph G. Martin, Ralph E. Marburger and

Ralph E. Weaver. The promoters are not yet ready to announce the details of the development.

**The Youngstone Coal Co.** has just been launched with a view to engaging in the production of coal in northern West Virginia. This company is capitalized at \$100,000. The headquarters of the concern are at Morgantown. Having an active part in forming the new company were: Erwin B. Stone, W. D. Stone, E. B. Stone, Sr., F. A. Stone, and Ethel Stone all of Morgantown.

Huntington people have organized the **Alma Pond Creek Coal Co.**, with a view to developing an acreage of coal in the Thacker field near Sprigg, W. Va. The new concern is capitalized at \$150,000. The office of the company will be at Sprigg. Principally interested in the new concern are H. L. Rucker, R. C. Pforr, P. P. Gibson, D. G. Hughes and M. F. Breslin, all of Huntington, W. Va.

## Industrial Notes

**The Maine Electric Co.**, manufacturer and distributor of steam and electric hoists and derricks, coal-handling plants and marine auxiliary machinery, has opened a Philadelphia office at 814 Walnut Street, Philadelphia, Pa. The new office will be in charge of F. V. Wetherill.

**J. F. Buhr** has opened an office in the Blodgett Engineering & Tool Co. Bldg., at 14th and Daizelle Sts., Detroit, Mich. The J. F. Buhr Machine Tool Co. will act as sales representatives for the Blodgett engineering and tool products.

H. M. Richards was recently appointed district manager in charge of the Cleveland district office of the **American Rolling Mill Co.** For a number of years he was located at the home offices of the company, and in recent years has been attached to the Pittsburgh district office. J. T. Hagan, of Cleveland, is associated with Mr. Richards in his new work, and the office is now at 1408 B. F. Keith Building.

The **Chicaco Pneumatic Tool Co.** announces the transfer of Ross Watson, formerly district manager of the Cleveland office of this company to the district managership of the Minneapolis branch to succeed D. M. Westbrook, now general manager of the Canadian Pneumatic Tool Co. Other recent changes include the transfer of L. J. Westenhover, from the Pittsburgh Office to Cleveland as District manager of that branch and E. C. Stroup, compressor engineer in the Boston territory, has been moved to the Pittsburgh District.

**Peter G. Rimmer**, for many years in charge of the Wilkes-Barre office of the Ridgway Dynamo Co., has resigned the position which he has held for the last two years with the Scranton Electric Construction Co., and on July 1 again took charge of the Ridgway office at Wilkes-Barre. E. W. Quiggle, who has been in charge of the Wilkes-Barre office during Mr. Rimmer's absence, is returning to the factory office at Ridgway, Pa.

The Buffalo office of the **Cutler-Hammer Mfg. Co.**, located in the Ellicott Square Bldg., formerly a part of the Eastern district, has been made part of the Central district, of which A. G. Pierce is general district manager, with headquarters at Pittsburgh. The Central district includes the territories covered by the Buffalo, Pittsburgh, Cleveland and Cincinnati offices. B. A. Hansen is manager of the Buffalo office.

## Association Activities

The annual banquet of the **Virginia Coal Operators' Association** at Norton was attended by about 150 operators and guests. Horace Williamson, of Cincinnati, presided. Harry L. Gandy, of Washington, executive secretary of the National Coal Association, the principal speaker, urged open frankness in meeting and dealing with the problems of the coal industry. He asserted that the fourth amendment to the federal constitution guaranteed the right to peaceful possession of private property, free from aimless fishing and probing, assuring his hearers that the National Association had justified its existence in challenging through the Maynard case the federal right of indiscriminate interference with private industry, if by nothing else that it has done.



## Traffic News

### Make More Protests Against Northwest Rate Revision

Almost every day some new party enters the lists against the rate revision on Illinois rail coal for the Northwest which the Interstate Commerce Commission has ordered for Sept. 10. The Wisconsin Traffic Bureau of Chicago, representing a large group of paper interests, has filed the latest petition with the Commission for a reopening of the case. Other recent ones were filed by the Waldorf Paper Products Co., of St. Paul, Minn., the Hydraulic Press Brick Co., of Minneapolis and the Twin City Coal Exchange. Up to August 1 the Commission had stood pat, however, so carriers are preparing to advertise the new tariffs.

### Indiana Rate Is Upheld

The carriers of Indiana failed to get the federal court to uphold them in their desire to maintain the present Indiana intrastate rates on coal. So the new low tariffs ordered for Aug. 1 by the Indiana public service commission took effect that day. Judge Samuel Alschuler, one of the three federal judges who sat *en banc* on the railroads' appeal for an injunction against the state commission, charged the roads with "panhandling" their case about from court to court in an effort to find one that would favor them. "You are bound by the decisions of the Indiana Court," he said. The state courts had already declined to interfere in the case. The roads are now petitioning the I.C.C. to interfere.

Fifty manufacturers in the Rock Island-Moline (Ill.) region are asking the State Commerce Commission for reductions in intrastate rates on coal to those cities. They point out that many other regions have recently been favored with rate cuts.

The application of the City of Watertown, S. D., for a suspension of the increased freight rates on coal to Watertown and other South Dakota points, in connection with the new rates on steam coal, has been refused by the Interstate Commerce Commission.

## Recent Patents

**Mining Machine.** Edmund C. Morgan, Chicago, Ill.; Olive E. Morgan, executrix of Edmund C. Morgan, deceased; 1,480,003. Jan. 8, 1924. Filed Jan. 5, 1916; serial No. 70,341.

**Spiral Lowering Chute.** Frank Pardee and Frank Pardee, Jr., Hazleton, Pa.; 1,480,105. Jan. 8, 1924. Filed April 28, 1922; serial No. 557,063.

**Scraper.** Leslie P. Green, Chicago, Ill.; 1,480,389. Jan. 8, 1924. Filed June 24, 1921; serial No. 479,991.

**Crossover Mine Switch.** Robert T. Bagby, Birmingham, Ala., assignor of one-half to E. M. Kilby, Birmingham, Ala.; 1,480,739. Jan. 15, 1924. Filed June 9, 1923; serial No. 644,343.

**Electric Accumulator or Battery for Miners' Safety Electric Lamps.** Richard Koch, Pittsburgh, Pa.; 1,480,764. Jan. 15, 1924. Filed Feb. 9, 1923; serial No. 617,980.

**Mine-Door Operating Apparatus.** Harry Frank and John Lewis, Fork Ridge, Tenn.; 1,481,128. Jan. 15, 1924. Filed April 13, 1922; serial No. 552,119.

**Scraper Bucket.** Harry A. Roe, Chicago, Ill., assignor to John A. Sauerman, Chicago, Ill.; 1,481,273. Jan. 22, 1924. Filed Dec. 23, 1920; serial No. 432,667.

**Grate Bar to Burn Pulverized Coal.** Francisco Herkenrath, Santiago, Chile; 1,481,366. Jan. 22, 1924. Filed Nov. 1, 1921; serial No. 512,075.

**Treating of Coal and Manufacture of Briquets.** Charles V. McIntire, East Orange, N. J., assignor to International Coal Products Corp., Bristol, Va.; 1,481,427. Jan. 22, 1924. Filed Aug. 9, 1920; serial No. 402,168.

**Treating of Coal and Manufacture of Briquets.** Chas. H. Smith, Short Hills, N. J., assignor to International Coal Products Corp., Richmond, Va.; 1,481,627. Jan. 22, 1924. Filed Aug. 9, 1920; serial No. 402,153.

**Mining-Machine Truck.** Roy Norman, St. Louis, Mo., assignor to the Sullivan Machinery Co., Chicago, Ill.; 1,483,053. Feb. 5, 1924. Filed May 19, 1922; serial No. 562,231. Renewed June 18, 1923.

**Apparatus for Blasting by the Use of Electricity.** John H. Bills, deceased; Mollie R. Bills, administratrix, Denver, Colo.; 1,483,209. Feb. 12, 1924. Filed June 12, 1922; serial No. 567,777.

**Runner or Guiding Means of Mine Skips, Cages and Other Vehicles Employed in Vertical Shafts.** G. W. Sharp, Johannesburg Transvaal, South Africa; 1,485,302. Feb. 26, 1924. Filed Aug. 31, 1922; serial No. 585,437.

## Obituary

**Grant Hubley**, vice-president and director, Greensburg-Connelville Coal & Coke Co., died July 20 of injuries received in an automobile wreck June 30. He was vice-president and general manager of the Oil Well Supply Co., of Pittsburgh.

**George W. Atkinson** of Louisa, Ky., died late in July at a Huntington, W. Va. hospital to which Mr. Atkinson had been removed after a few days' illness at his own home. He had, however, been in poor health for some time. Mr. Atkinson was 56 years of age.

For many years he had been identified with the coal industry of southern West Virginia, being originally identified with the Flat Top Coal Co., now the Pocahontas Coal & Coke Co. Later he was associated with the Guyan Coal Land Co. in Wayne county, a subsidiary of the Flat Top Coal Co. Mr. Atkinson organized the William Light and Power Co. and also the Logan Light and Power Co. He was at the time of his death, owner of the water works at Louisa.

Mr. Atkinson was a graduate in civil and mining engineering of the Virginia Polytechnic Institute of Blacksburg, Va., and a native of Montgomery County, Va.

## Coming Meetings

**New York State Coal Merchants Association, Inc.**, 14th annual convention, Sept. 4-6, Stamford-in-the-Catskills, N. Y.; headquarters Churchill Hall. Executive secretary, G. W. F. Woodside, Arkay Building, Albany, N. Y.

**American Chemical Society.** Fall convention Sept. 8-11, 1924, at Ithaca, N. Y. Secretary Gas and Fuel Section, O. O. Malleis, the Koppers Co., Pittsburgh, Pa.

**Oklahoma Coal Operators' Association.** Annual meeting Sept. 11, 1924, McAlester, Okla. Secretary, A. C. Casey, McAlester, Okla.

**Association of Iron and Steel Electrical Engineers.** Annual meeting and exposition at Duquesne Garden, Pittsburgh, Pa., Sept. 15-20. Secretary, John F. Kelly, 1007 Empire Bldg., Pittsburgh, Pa.

**National Safety Council.** Thirteenth annual safety congress Sept. 29 to Oct. 3, Louisville, Ky. Managing director and secretary, W. H. Cameron, 168 No. Michigan Ave., Chicago, Ill.

**American Institute of Mining and Metallurgical Engineers.** Fall meeting, Birmingham, Ala., Oct. 13-15. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

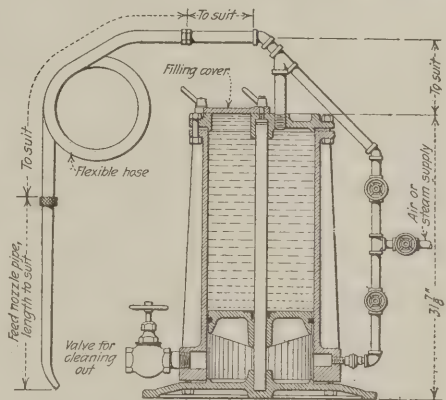
**American Institute of Electrical Engineers.** Fall convention, Pasadena, Calif., Oct. 13-17. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

## New Equipment

### For Spraying Surfaces

Many walls should be sprayed to make them airtight. No stopping, no furnace wall is tight if made out of brick and not coated with some kind of plastic material. The equipment illustrated is designed to spray plastic material on boiler baffle walls but it has other uses. It may be used to patch roofs and walls of furnaces of all kinds. It can be operated by air or steam pressure; the movable bottom lifting under pressure and expelling the liquid.

By means of a pipe leading direct to the hose any material clogging the hose or nozzle can be blown out by air or steam whichever furnishes the power for the operation of the machine. The long nozzle places the material in the most inaccessible places in either hot or cold furnaces. With this type



Sprayer for Plastic Material

The cylinder rapidly is filled with the plastic mixture through the cover at its top. This is replaced and screwed down. Air or steam is admitted below the piston and the liquid above it is expelled under pressure into the hose and nozzle.

of equipment labor is saved and the time lost in shutting down for repairs. The equipment is made by the Co-operative Utilities Co., 1014-1015 Harrison Building, Philadelphia, Pa.

### Man-Cooling Shop Fan

Hot work is a trial in warm weather. Many a blacksmith or foundry man would do better work if kept cool by a fan. Any kind of shop man will be better contented and more active if given a breath of fresh air in warm, humid weather. A man-cooler has been developed by the Buffalo Forge Co., of Buffalo, N. Y. This unit is made in two sizes, the larger having a 36-in. diameter fan wheel, and the smaller a 30-in. wheel. The entire fan is of heavy construction to insure against vibration. The screen inclosing the fan wheel is extra heavy, and the rim itself is made of 2½ x 2½ in. angle. The unit, however, can be moved easily.

This fan has only three essential parts—the fan wheel, a direct-connected motor, and a pedestal. The wheel is





### Fan Cools Shop in Hot Weather

Blades revolve at speed of 900 r.p.m. Screen is heavy with strong rim. Made for the rough usage likely to be sustained by a shop fan.

composed of ten blades so designed that the air is delivered in a concentrated stream. This factor of air delivery gives the best cooling efficiencies at the lowest expenditure of power. A direct-connected motor placed directly back of the fan wheel supplies the motive power. The 36-in. man-cooler fan is supplied with a 5-hp. motor, and the smaller fan is equipped with a 3-hp. unit. The speed for fans is 900 r.p.m. The pedestal is a heavy casting; four bosses are provided in the base for foundation bolts in case the fan is kept in a permanent location.

### Mine Hoist Is Provided with Electro-Pneumatic Control

An unusual and interesting type of control for a large mine hoist will be put in operation in the early part of this coming autumn by the Lehigh Coal & Navigation Co., Lansford, Pa., at its No. 4 shaft. The installation will consist of a 1,200-hp. 300/293 r.p.m., 2,200-volt, three-phase, 25-cycle, wound-rotor induction motor, which will be controlled by electro-pneumatic-unit-switch type of contactors. Each contactor is closed by air pressure against a powerful spring, the action of which produces positive closing and a quick break when opening.

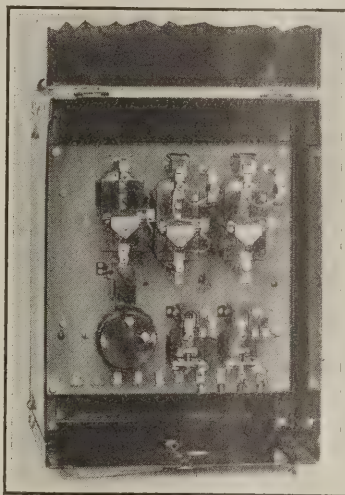
The primary reversing contactors will consist of three 2-pole elements, electrically and mechanically interlocked and mounted on a steel supporting frame, totally inclosed. The inclosing covers will be provided with a specially designed muffler to deaden the noise, characteristic of all high-voltage air-break contactors. The secondary accelerating contactors will consist of twenty-four unit switches mounted on three separate steel frames, giving nine accelerating points. These contactors will not be enclosed, as the only noise is that accompanying the escaping air when the contactors open. Because of the noiseless operation of the accelerating contactors and their separation into three frames they can be mounted near the motor with the grid resistors and thus utilize waste space which will result in a material saving in the cost of installation.

The action of the electro-pneumatic contactors is governed by the manipulation of a small master controller, the contacts of which control an electrically operated air valve on each unit switch. Automatic acceleration is obtained by current-limit accelerating relays and interlocks so that each switch will operate in the proper sequence without excessively high currents.

Every safety feature is provided for the successful operation of the complete equipment. The failure of the alternating-current power, the air pressure or the control circuit, or the occurrence of an overtravel will immediately open all main switches and apply the hoist brakes. This control is being furnished by the Westinghouse Electric and Manufacturing Co.

### Machine-Tool Controllers for Direct-Current

Magnetic machine-tool controllers recently have been placed on the market, employing the counter-electromotive force method of acceleration. These controllers are applicable to both reversing and non-reversing, constant



### Reversing Type Controller

Acceleration is governed by the counter-electromotive force generated in the motor.

and adjustable speed drives requiring normal starting conditions. They have been developed primarily for application to direct-current motors in sizes ranging up to and including 15 hp.

The controller provides two accelerating points; the starting resistor is automatically short-circuited in one step upon proper acceleration of the motor. This is accomplished by an accelerating contactor the closing of which is governed by the counter-electromotive force of the motor.

These controllers are made by the General Electric Co. Coincident with the adoption of the new type of starter for its smaller motors, a complete redesign has been made of its larger types of magnetic machine tool and general purpose controllers.

### Low Switch Stand Has Throw Parallel to Track

A longitudinal-throw switch stand of low height and simple construction recently has been patented by Louis A. Green and will shortly be placed on the market by the L. A. Green Railway Equipment Co., of Pittsburgh, Pa. In the design of this stand the object sought was the provision of a simple, durable device of small first cost, particularly adapted to use in the restricted passages of mines, tunnels and the like.

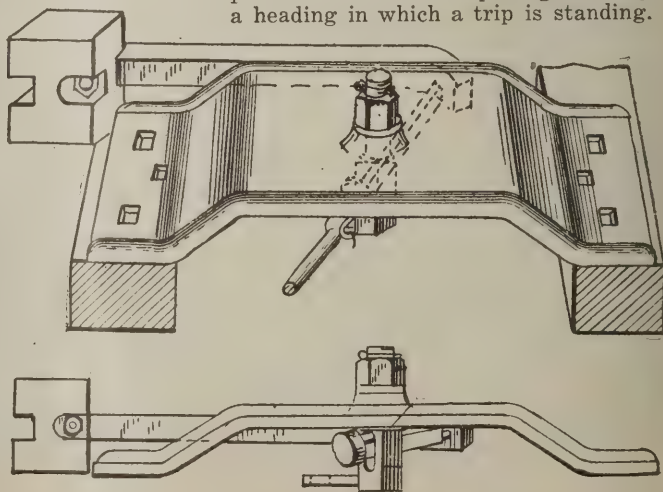
In detail this stand consists of four chief parts, namely: (1) A stand or support, (2) a hand lever pivoted at one of its sides, (3) a link or lever connecting this hand lever with (4) a vertical shaft, provided at its lower end with a crank that engages a link or connecting rod joining it to the bridle bar of the switch.

As may be seen in the accompanying illustration the vertical shaft which is pivoted to the stand at its upper end is slotted. Through this slot works the lever which joins this shaft to the hand lever, which latter is curved slightly inward at its lower end. The arrangement is such that in either the open or closed position of the switch the hand lever, which is usually weighted, lies parallel with the ground.

It is usually conceded that a longitudinal or parallel-throw switch is safer than one having a transverse-throw, for in working the lever the switchman is not compelled to reach near the track to either raise or depress the lever. He is thus at a safe distance from the locomotive or trip at all times, and is not liable to pitch forward over the track. Furthermore, a low stand such as this one does not offer an appreciable obstacle to passage through a heading in which a trip is standing.

### Switch of Simple Construction And Minimum Height

The simplicity of this switchstand is apparent at once — and simplicity means both reliability and low first cost.





# COAL AGE

McGraw-Hill Company, Inc.  
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Devoted to the Operating, Technical and Business  
Problems of the Coal-Mining Industry

R. Dawson Hall  
Engineering Editor

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## Give and Take

WE HAVE ALL the impatience of Eugene McAuliffe with the persons who sit back in their seats and listen to the discussion and who take and never give. We have as much respect for them as we have for those numerous people who are frequently guests at other people's tables and never have guests at their own. If they have nothing of their own to give, of course they are excused, but if they have much and pretend they have none or withhold when they are anxious to receive, theirs is a mean and sordid part indeed. American?—not at all. They live in a little land of their own, making forays on such of their neighbors as they see have, or may have, something they want.

## Troubles from New Financing

SOME OF THE large projects being put into operation by money obtained from financing in New York and elsewhere, the money not coming from the industry but from bankers, is occasioning difficulties between capital and labor, for the employees not knowing where the money comes from believe that in some mysterious way it is derived from the profits of coal production. That assumed, they believe the present unprofitableness of operation is subject to grave doubt.

Instead, it is the fear that profit will be lacking and losses will be more severe than before, that is making mine owners expend borrowed money for purposes of efficient operation. Operators are obliged to go outside to get the sinews of war to wage a successful fight against competing operators. Especially is this true in the union fields. The mine workers are ill-advised to interfere with operation, because only by large expenditures at the mining plants at which they work can they hope to retain their employment. A few strikes may make the operators less willing to attempt what is so essential for the welfare of both the men and the company.

## Coal by Pipe

PROFESSOR GEORGE GUESS, of the University of Toronto, told the British Association for the Advancement of Science that eventually we would circulate powdered coal through pipes to domestic furnaces. He declared that better temperature control and greater economy would result.

The idea is not by any means wild. Gas is not a sufficiently dense fuel for us to get satisfactory results from its piping, even under high pressure. Coal could be circulated as dust under a lower pressure than has been proposed for gas and even though it is mixed with air would deliver many more thermal units than an equal volume of gas. Of course, mixtures of coal dust and air in a pipe might be dangerous when a flame is at the burner, but so far no danger has been experi-

enced, probably owing to the small area of the orifice and the hazard may be as remote as the passing of flame back through gas pipes, though the presence of air in the case of pulverized coal justifies a little caution in adopting such a plan, which might introduce danger if a pipe were broken.

If Professor Guess' suggestion is any more than a mere day dream it would seem advisable that the operators test its possibilities. What a wonderful opportunity for the proposed Coal Institute!

## No Time to Idle

WHEN MINES are idle is a good time to clean up fallen airways and mend or replace leaking brattices. Air is getting to be an expensive item in mine costs. It does not pay to drive or draw it through airways choked with fallen rock or filled with heaved clay. It is extravagant to waste it at leaky stoppings. When the mines are idle, the track is clear and empty cars are plentiful is a good time to make these improvements under the vigilant inspection of the mine foremen. It is daywork and so needs close supervision under and above ground.

In such times as these it is well to examine costs and see what it will save to make certain improvements now or later. Too many mines are ruined by robbing airways and headings that might have been kept intact had a thought been given to their possible use as intake or return airways.

This is the time for planning, even if no money is granted for improvements. If the change cannot be made now, the work may be estimated as to quantities and cost so that when opportunity does come a proper statement of investment, advantages and savings may be promptly presented without the delay of a survey and a study.

## Going Dry

WE MUCH regret that the report of the Safety Committee of the Rocky Mountain Coal Mining Institute spoke a word for humidification and sprinkling. We expect the West to lead in rock dust, first because it has a plentitude of that commodity and secondly because it has a shortage of water. Winton, Wyo., that has led the West in rock dusting may be shorter of water than other mining villages but surely many others are not far behind.

Why then should the West cling to humidification, except at the working faces and for laying the dust on cars, loaded and unloaded? As for sprinkling, it is hopeless in a dry climate. We believe in immersion rather than in sprinkling, but where is the water that will keep a Utah or a Wyoming mine properly immersed?

Because, however, there are some who still may want to use sprinkler cars, despite their undoubted disad-



vantages and because we shall probably continue to use water in rooms as a way of attacking explosions a little nearer the source than is possible where headings only are sprinkled, one of these devices is portrayed this week in "Problems of Underground Management." Sprinkling pipes carried to the face have the advantage that they can be used at any time. The sprinkler car has much to commend it, especially the breadth, length and elevation of its application of water and the fact that its use is not likely to be slighted by the man who should do the sprinkling, but it does not have the merit, except when shotfirers are employed, of performing its work near the time of maximum peril, which is when the place is being operated and shots are being fired. If the cutter-bars are to be sprinkled, the pipes will be on hand for a general sprinkling of the face, and also of the room gob and in that event the sprinkler car will have a difficult time justifying its existence. Times change rapidly. A few months ago everyone was looking for a sprinkler car, and now the nation has gone dry.

### Let Politicians Beware

POLITICAL activity has made Great Britain examine her industries with care. They have been found wanting, of course. They do not work steadily. They do not give the workman all that he needs. Hence the politicians have been able to indict industry quite satisfactorily.

Now the politicians are asked to reform industry and if they cannot reform it, to take it over and operate the factories, the mines and the mills better than the corporations are doing. This is a hard problem for politicians to solve. They are proving even less successful than the industrialists and the result is the people are ill satisfied. The argument, "If you don't like the way it is done, do it yourself" is disconcerting if the man who is asked to do it doesn't know how. The politicians will try anything once. But they will find they are face to face with a problem they cannot solve.

The working men are not satisfied with the solution proposed in the "Coal and Power" report of the Liberal party, of which we published a happily worded description by George Otis Smith last week. It does not rest satisfied with reasonable royalties, it wants no royalties whatever. Both profits and royalties are taboo as also the closing down by a uniform wage scale of inefficient mines. It must be remembered that workmen will have to move or be idle who have been working at naturally difficult operations if such mines are put out of business. So the report, radical as it is, will satisfy no one. The politicians have stirred up a ghost that they cannot down.

Though it is a fundamental tenet that government is for the people and not the people for the government yet at the same time that doctrine has so often made a dependent and weakling democracy and the opposing tenet strong and progressive nations, that it would seem better to beware of accepting in too full a sense the conviction that the purpose of government is to coddle and mother the individual, but rather to keep steadily in the forefront the idea, ridiculous as it may seem, that the purpose of government is to establish an ideal to which the individual can render a perpetual service.

### The Worst Industry

MANY a perfectly good fact has been ruined by a carelessly appended superlative, and perhaps it would not be well to suggest that there is any worst industry among the many that might run close for that unenviable distinction. Still, if we had to award the booby prize it would probably go to the constructors of houses, water-works, roads and railroads rather than to the coal men on whom this discredit is usually pinned.

No industry works more irregularly than that of construction as we have often pointed out. None houses its men in more insanitary, overcrowded and impermanent hovels when housing has to be provided. Men are herded into box cars, lodged in adobe huts or thrust into long bunk shanties with little or no consideration as to health, comfort or morals. Justice compels us to admit that these conditions had some excuse and that recent years have shown much improvement in the building of construction camps.

One might add, if one had statistics to ascertain it, that none has a higher record for accident. Few workmen have been guilty of more violence than the iron workers. Few have had more stringent rules against large output and efficiency than the construction unions, and this industry is almost the only one that has jurisdictional strikes. The construction industry, if not the worst, is so near that goal that you will not need to travel further when it is reached.

Says a Committee of the President's Conference on Unemployment, "Building trades' workers in the average American city, it appears from information gathered in our survey, are employed at their trade less than three-fourths of their time. In the average year these men must be paid enough that they can support themselves and their families for twelve months on wages received for seven to ten months' work.

"For most contractors the overhead costs for maintaining their offices and staff during the whole period of twelve months must be charged against the jobs carried on actively during only seven or eight of those months. Supply dealers must maintain establishments big enough to handle a large quantity of work during four or five months. These establishments are practically idle during at least three months and are operating at only a fraction of their capacity during the rest of the year." And so on for building material manufacturers and architects. All this sounds like the indictments that have been and are being passed on the coal men. There is the old familiar ring. The judge's verdict is the same but another culprit stands disconcertedly at the dock.

As for combinations in restraint of trade, the resemblance is not so close. The coal operators have been charged with violations of the Sherman Act but the allegation has never been proved. The material trades and the constructors, both only in part, have been accused, but in their instance the charge has been sustained.

We are not ready to condemn those faults which are almost unavoidable in the construction industry, but we cannot but be reassured by knowing that unemployment, excessive pay to counterbalance short time, bad housing, undue accident rates, violence in strikes, restricted output, insufficient ability to fill crying needs, excessive prices and costs with combinations in restraint of trade also are alleged of an industry that so far has escaped general condemnation. We would like to know why?





General View, Winterslag

## Campine Region—A Coal Field with No Completed Shaft Less Than Two Thousand Feet Deep

Coal Discovered in 1901—Apparently Portion of Field Extending from England to Germany—  
Coal of Excellent Quality Especially for Metallurgical Fuel—Longwall  
Mining and Rope Haulage Adopted

BY D. ADAM\*  
London, England

EARLY IN THE nineteenth century geologists speculated on the possibility of finding, under the Secondary and Tertiary formations of Northern Belgium, a concealed coal basin linking the Westphalian field with that of the English Midlands. It was not, however, until 1876 that the theory took definite shape in the writings of Guillaume Lambert, then professor of geology in the University of Louvain. The theory was still more strongly advocated by his pupil André Dumont, son of the celebrated Belgian geologist. In 1901 Dumont obtained verification of his beliefs from a borehole that he and his associates in a prospecting company put down near the little village of Asch.

News of the discovery of coal below the moors and sand dunes of the Campine created a profound sensation in Belgium, and during the following three years over sixty boreholes were sunk by various prospecting parties. Although in many cases too hastily drilled to give exact information about the overburden, these boreholes served to indicate approximately the northern and southern boundaries of the basin and to confirm the hopes raised by the first discovery. But they showed also that there existed a formidable obstacle to commercial exploitation in the overlying strata which consist in large part of running sand and clay, extending to depths of 500 to 600 m. (1,640 to 1,968 ft.). It became evident that shaft sinking would require a far greater capital outlay than had been usual in the southern field and that mining operations would have

to be conducted on a big scale in order to provide for the redemption of this investment.

Fortunately the Campine basin proved to be rich in coal of a quality that hitherto had been lacking in Belgium. The gas and coking fuels of the upper measures had not been denuded as in the regions of Liège, Charleroi and Mons, and in themselves were sufficient to attract the capital necessary for their exploitation. Much of this capital came from iron and steel manufacturers in France and Belgium who were interested; not only in the profit derivable from mining operations, but in opening up a source of coking coal that would make them independent of foreign supplies.

### SEVEN COAL COMPANIES START OPERATIONS

In 1906 eight concessions were granted, this number being increased later to nine. Today seven operating companies are working on these concessions. The most advanced of these from the point of view of exploitation is the Charbonnages de Winterslag with an output of 2,500 to 3,000 metric tons per day (2,755 to 3,306 net tons) and equipped to handle an output of 4,000 metric tons (4,408 net tons) when sufficient faces have been developed. Its subscribed capital consists of 12,000 shares (of no par value), 26 million francs (now \$1,310,000) in 4½ per cent bonds and 34 million francs (now \$1,715,300) in 6½ per cent bonds. On the balance sheet presented in June last the concession and plant were valued at 75 million francs (now \$3,783,750). For the financial year ended March 31, 1924, the shareholders received a dividend of 300 francs (now \$15.04) per share, the first since exploitation proper began in October, 1917.

Adjoining Winterslag on the north is the concession

\*University of Glasgow.

NOTE—At the Winterslag colliery shown in the headpiece, cars are moved from the shaft at the right to the screening and washing plant on the left over an elevated trestle by means of an endless chain. The mine offices, bathhouse, lamproom, etc., may be seen on the right, some of the mine dwellings appearing in the foreground.



of Charbonnages Liegeois and on the east that of Charbonnages André Dumont. Both these were practically at a standstill during the four years of the German occupation and are today only in the initial stages of exploitation. The former company with a capital of 80 million francs (now \$4,036,000) has one shaft sunk to a depth of 860 m. (2,822 ft.) with main galleries being driven to open three beds. In the second shaft, sinking was delayed by an influx of water at the 340-m. (1,115-ft.) level but has now been resumed. The two shafts of the Charbonnages André Dumont have been sunk to depths of 710 and 700 m. (2,329 and 2,297 ft.) respectively and already, with temporary hoisting equipment, a small output is being obtained from the development entries.

At the eastern end of the field, with one boundary on the Dutch frontier, are the concessions Guillaume Lambert and Sainte-Barbe, belonging to the Charbonnages Limbourg-Meuse. This company with a capital of 75 million francs (now \$3,783,750) has already reached the production stage, though still far short of its calculated normal output. At the present time exploitation is concentrated chiefly in three beds at depths ranging between 600 and 700 m. (1,969 and 2,297 ft.). At the opposite end of the field is the concession of the Charbonnages de Beeringen (capital 75 million francs, now \$3,783,750) which, after Winter-slag, is the most advanced of the Campine collieries. For the first quarter of 1924 it had an output of 64,000 metric tons (70,528 net tons).

The sixth operating company, Charbonnages de Helchteren et Zolder, with concessions adjoining Beeringen on the west, is still engaged in shaft sinking. One shaft entered the coal measures in June, 1923, at a depth of 700 m. (2,297 ft.) and the other is expected to reach the coal measures in September or October of this year. Another operating company, La Société de Houthaelen, was formed at Brussels in July, 1923, with a capital of 35 million francs (now \$1,765,750). It is at present only at the stage of prospecting its concession.

Though much remains obscure in the geology of the Campine field, sufficient development has been performed to indicate its general structure and its relationship to the great Anglo-German basin. The known



Fig. 1—Location of the Campine Field

This field is apparently a portion of the great coal basin that stretches from Ireland to Germany or possibly even into Russia. Although coal was long believed to exist in the Campine it was not until 1901 that a borehole proved its location.



Fig. 2—Detail of the Concessions Granted

Eight mining areas or concessions have been granted and three reserve areas are held by the state. In some concessions production has started, but the others are as yet in little more than the prospecting stage.

facts hitherto scattered through many different publications have been summarized recently by Professor Stanier\* who, as consultant geologist, has taken an important part in the prospecting work.

It is now established that the Campine basin is a portion of the long field starting in Westphalia and traversing the province of Limburg in Holland, the Campine, Province of Antwerp, Zeeland, the North Sea and the Midlands of England. It was apparently protected from denudation and from the folding which has greatly disturbed the Liège-Charleroi-Mons basin by the vast Siluro-Cambrian anticline of South Wales and Brabant. It has been affected, however, by a complicated system of faults. One set of these appears to dislocate only the coal measures.

#### CROSS FAULTS DIVIDE FIELD IN COMPARTMENTS

The general direction of this first set of faults is north-west to south-east, but there are also cross faults at right angles with it which divide the coal measures into a series of box-like compartments. The second set of faults limits the basin on the north and probably also on the south. The northern faults affect the strata from the coal measures to the Quaternary gravel and have been compared by Professor Stanier to a gigantic staircase, displacing the coal measures to a depth of more than 2,000 m. (6,562 ft.) below the Tertiary rocks of the Fosse de Ruremonde, a depression well known to Dutch geologists who have approached it from the other side.

Their position along the southern boundary of the field remains obscure, for no boreholes have been continued beyond the carboniferous limestone at the base of the coal measures. It appears probable, however, that the Campine basin is completely detached from the Liège basin by the Siluro-Cambrian anticline of Brabant. On the east there is connection with the coal measures of Limburg in Holland and on the west with the unexplored basin of the province of Antwerp, which, for the time being, is retained as a government reserve.

The Campine coal measures belong to the Westphalian system and it is to the upper portion, in a band known as the Genck series, that development is at present confined. The prevailing dip is about 5 deg. in a north-

\*"Résumé de Nos Connaissances sur la Géologie de la Campine" Annales des Mines de Belgique, 1924 t.XXV Ire. Livraison p. 163.



early direction, with the line of strike forming a curve. The faulting, however, to which reference already has been made, causes many local variations in dip and strike. The number and thickness of the beds encountered in the different shafts and boreholes also vary considerably. Some typical sections are shown in Fig. 3.

A calculation made by Professor Denoël of Liège University gives the following figures for the reserves in the basin. These are based on the assumption that extraction can be carried to a depth of 1,500 m. or 4,921 ft.

	Millions of Cubic Meters
Gas coal .....	3,600
Coking coal .....	2,900
Semi-bituminous coal .....	400
Total .....	6,900

Assuming that the density of this coal is 1.25 and that a possible extraction of 75 per cent can be attained,

lining of the shaft with cast-iron tubing down to the top of the coal measures. In the earlier shafts the ground was frozen only to the Tertiary shales at a depth of about 340 m. (1,115 ft.), the intention being to use cement injections should further water-bearing beds be met. This plan, however, left out of account the Hervian Sand which swallowed cement, without any diminution of its flow or pressure.

In the end, freezing had to be resumed at the lower level and, as this is a difficult and costly operation, the later shafts were frozen all the way to the coal measures. The only shafts which escaped the Hervian Sand were those at Winterslag, where, by some fortunate chance, only the upper portion of this band was met. It was this good fortune that allowed Winterslag to get so far ahead of its neighbors, though they began sinking at the same time.

Before the sinking of these Campine shafts, the greatest depth to which freezing of the strata had been carried was 300 m. (984 ft.). To advance at one step

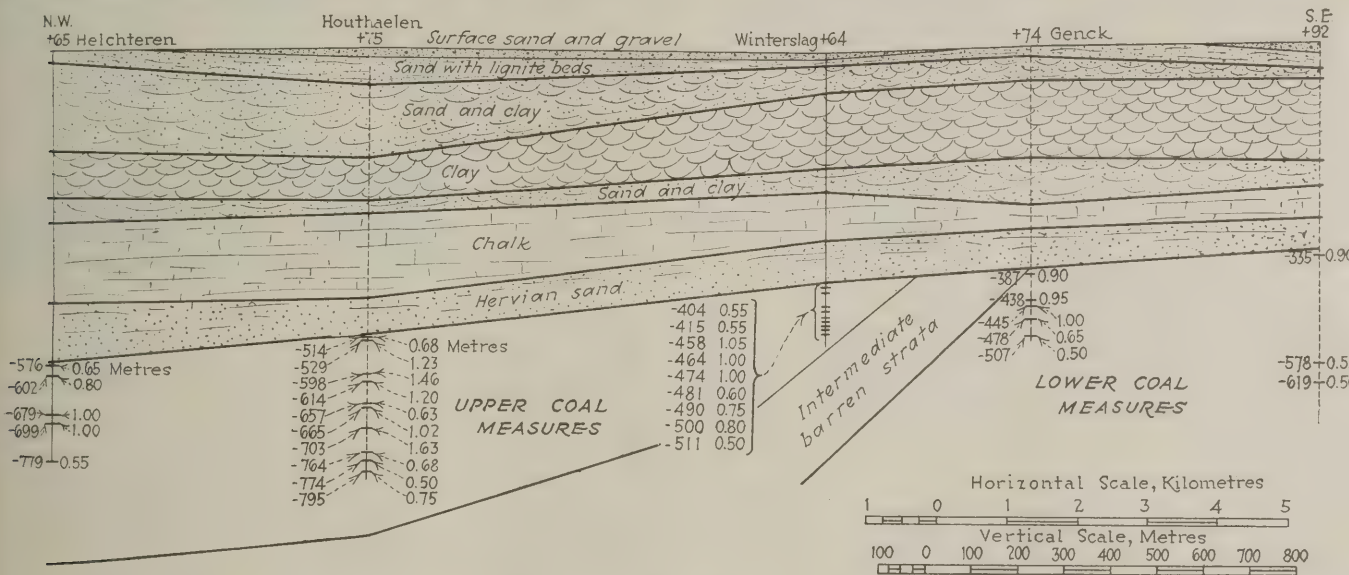


Fig. 3—Cross-Section of the Coal Measures Along Line XY of Fig. 2

Presence of the Hervian Sand which carries much water under high pressure makes shaft sinking difficult. This sand literally swallows cement without any appreciable effect. Consequently it was necessary to freeze the measures surrounding the shafts. Although this process is slow it has proved highly satisfactory, and shafts thus sunk when lined with cast iron are practically dry

there is a reserve on the basis of Professor Deonël's figures of more than 6,000 million metric tons (6,612 million net tons) in this field. If mining were limited to a depth of 1,000 m. (3,281 ft.) the quantity would be about 4,000 million metric tons or 4,408 million net tons.

All formations subsequent to the Carboniferous are represented in the strata overlying the coal measures of the Campine, though it is only to the north in the Fosse de Ruremonde that the complete sequence is found. At the top of the coal measures now being worked there appears to be an unconformable junction with an upper band of the Cretaceous, known locally as the Hervian Sand. This is of evil repute in the Campine, for, though in its upper layers it consists of a sandy chalk or marl, at the base it becomes nearly pure sand, heavily watered and offering a formidable obstacle to sinking operations. Above this Hervian Sand there is an exceptionally complete sequence of Tertiary strata to the Quaternary gravel and sand of the surface.

In all the shafts sunk in the Campine it has been necessary to use the freezing process, followed by the

to a depth of 600 m. (1,968 ft.) was a great achievement in engineering for which credit must be given to the late Louis Sauvestre, who had charge of the sinking at Beeringan and to the Foraky Boring & Shaft Sinking Co., Brussels, which drove the first three shafts to reach the coal measures and has since, either alone or in collaboration with other contractors, had a hand in sinking most of the Campine shafts.

Thanks to the experience thus gained, the sinking of shafts by the freezing process to depths of 600 to 700 m. (1,968 to 2,297 ft.) now can be undertaken with the same certainty and security as sinking by ordinary methods through dry rock strata. The work is naturally slower and more costly but results in as perfect a shaft as any that can be sunk in the most favorable ground. Notwithstanding the reservoir of high-pressure water encircling the shaft, the inflow, after the tubing is placed and the ice wall thawed, is insignificant.

So dry indeed are these shafts that in subsequent sinking through the coal-bearing strata the men employed frequently discard their customary garb of oil-



skins. In the producing mines the water inflow is small (at Winterslag 8.5 cu.m. or 2,245 gal. per day) and the workings are dry. The shafts are  $5\frac{1}{2}$  to 6 m. (18 ft. to 19 ft. 8 in.) in diameter and are divided into four winding compartments.

The resemblance of the Campine coal field to that of the English Midlands, with its flat regular beds, has led to development on the same general plan as that followed in the longwall workings of the English collieries. This plan, however, has been modified by ideas and habits transplanted from the Liège-Charleroi-Mons coal field. At Winterslag the bed is entered from the shafts by two parallel galleries. From these, two main entries are driven as nearly as possible to the rise, but at a gradient not exceeding 3 deg. Between them is carried a longwall face 100 m. (328 ft.) in length. One of the entries serves as an air intake and main haulage road and the other as a return airway.

#### OSCILLATING CONVEYORS USED AT THE FACE

From these passages lateral entries are projected on a straight bearing following approximately the level course or strike of the bed and between them are carried longwall faces 80 to 100 m. (262 to 328 ft.) long. Fig. 4 illustrates the general scheme of the workings. In practice it is not possible to keep strictly to this geometrical plan, as faults and other disturbances interfere. The aim, however, is to block out the coal in these 100-m. panels and, as far as the stratification and the limiting haulage gradients permit, to carry the panels forward on a straight bearing.

The coal mined is loaded into a mechanically driven oscillating conveyor which extends the whole length of the face and discharges into cars on the haulage entry. Here an endless rope brings the cars in trips to and

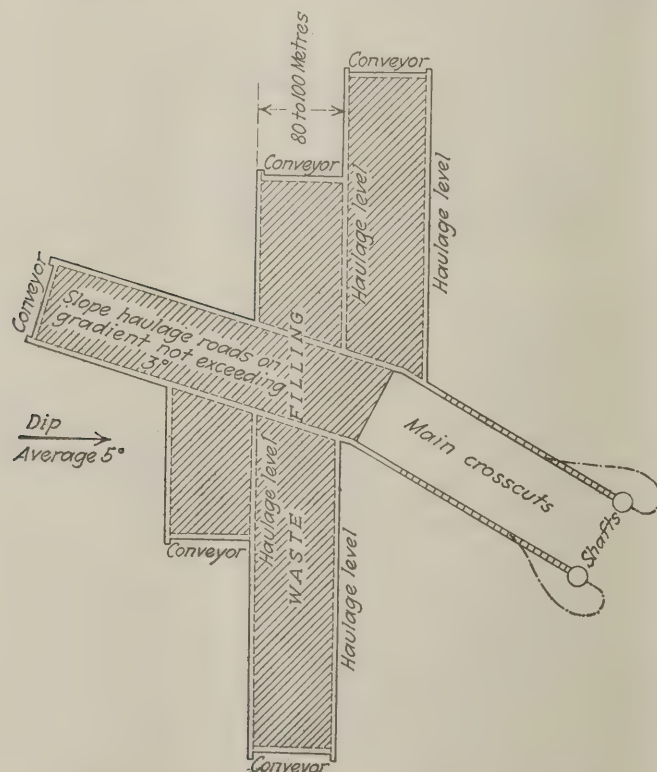


Fig. 4—Method of Working by Longwall Faces

Headings are driven so as to obtain an advantageous grade. Working faces are kept as nearly level as possible. Oscillating conveyors are used to move the coal to cars on the heading. Coal is broken down by means of drills, although experiments are being conducted with undercutters. This coal bed is about 40 in. thick.



Fig. 5—Headframes at André Dumont Colliery

European coal mines are built to endure. If a mine is expected to last for 200 years the headworks are constructed to last an equal length of time. Under such circumstances it is highly important to plan headframes and the like amply strong in the first place.

from the face. The coal is broken from the face by light jackhammer drills, no explosives or undercutting being required. Experiments, however, now are being made in the Campine field with various types of coal-cutting machines.

In a bed one meter (3 ft. 3½ in.) thick, eighteen men can break down and load into the conveyor, about 200 metric tons (220 net tons) of coal per shift of 8 hr., but this figure will probably be increased when transportation has been improved. Thus far the maintenance of haulage roads under the heavy roof pressure has proved a difficult problem at Winterslag, but it is hoped that relief will be secured as the face advances and the roof settles firmly on the waste filling.

Filling with waste is also a difficult problem for the mining engineers in the Campine. According to state regulations the workings must be completely stowed. In a longwall face, with an interval of 80 to 100 m. (262 to 328 ft.) between the roadways, the quantity of waste obtained in normal mining operations is insufficient to comply strictly with this regulation, and filling material must be brought in at considerable expense and inconvenience from some source outside the mine.

No doubt exemption from this regulation could be obtained, but, for the moment, the opinion prevails that complete stowing is necessary for safe working under the heavy roof pressure encountered. Hydraulic stowage has been suggested, but until the underground roadways are in a more stable condition, it would be risky to bring high-pressure pipe lines through them. Perhaps at some later date the orthodox longwall system, with side packs along the roadways and complete subsidence of the roof behind the face, will be tried.



If experience in British collieries can be taken as a guide this may ease the pressure on the roadways.

At Winterslag all underground transportation is by endless rope, the cars being attached in trips of forty or fifty. At some of the other collieries, however, it is proposed to use benzine (gasoline) locomotives. At one of the collieries in Holland, where conditions are similar to those in the Campine, a trial is being made with a storage-battery locomotive, and if its performance is

satisfactory the experiment is likely to be imitated. The chief obstacle to the use of storage-battery locomotives in the Campine is that in the initial stages of development the underground haulage roads are more or less unstable. The floor "creeps" a good deal, and it is difficult to maintain the tracks in proper alignment. Apart from this, however, the conditions seem to be ideal for battery locomotive haulage and it is quite possible that eventually this method of haulage will be adopted.

# How Output of Room-Slabbing Mines May Be Controlled

While Slabbing Pillars, Record Tonnage Is Obtained—When Driving Rooms, Output Is Low—Methods That Keep Output Steady

BY CHARLES GOTTSCHALK  
Consulting Engineer, Evansville, Ind.

EVER SINCE active interest in underground coal-loading appliances began, demand has grown for a type of machine that can load coal along a continuous face several hundred feet in length into a slowly moving trip of mine cars. The manufacturers have put forth every effort to meet this demand, and accordingly machines have been designed with swinging rear-end conveyors.

For various reasons, however, this has only partially solved the problem. The main outstanding difficulties encountered are the length of time required to develop the necessary modified-longwall faces, their comparatively short life, the control of the mine roof over wide worked-out areas and the need for a speedier means of developing room entries.

Many schemes have been proposed and tried with varying degrees of success. Some good layouts no doubt have been abandoned because of the immediate difficulties encountered. These resulted from attempting to control the roof in areas insufficiently large. Better results might have been obtained had perseverance been shown, for in that event a larger area would have been developed, thus providing more favorable conditions.

At the present time several operations are planning to increase production by driving rooms exceptionally long and then widening them out by successive slabbing cuts to a final width depending upon local roof conditions. This plan gives promise of affording a practical

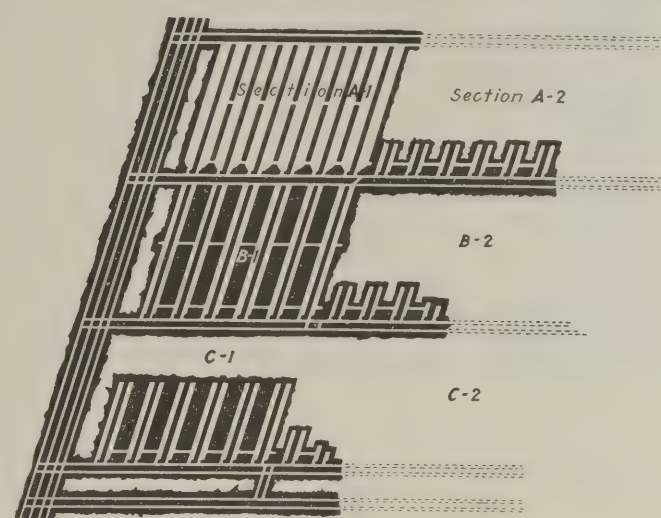


Fig. 1—Mine Layout Adapted to Slabbing

Slabbing has just been completed in section A-1 and the short rooms in section A-2 are in readiness for the three loaders that have worked out A-1. Slabbing in B-1 has just been started by the three machines that drove the rooms to completion. Development of rooms in B-2 is to be finished when slabbing in B-1 is completed. The rooms in section C-1 are in process of driving and will be ready to be slabbed when slabbing is finished in B-1. When C-1 has been slabbed out territory will have been developed ready for slabbing in A-2, and so on. Fig. 2 shows the schedule of operation and estimated tonnage.

means for increasing the output of loaders beyond what could be obtained under normal room-and-pillar methods.

Room slabbing has been successfully employed in hand loading with exceptionally high output per loader together with an excellent low-fatality record. It is certain that all mine roofs are not suited to this method of operation but where it can be adopted the management will do well to consider this plan and the advantages to be gained thereby.

One of the difficulties first encountered in projecting a mine on this basis is the fact that room driving is much slower than slabbing. Thus should the loaders

TABLE I—Results Obtained with Various Operating Conditions in Slabbing Mine.

Layout	1	2	3	4	5
Estimated tons per 8-hr. shift per loader in room driving.....	125	150	150	150	150
Estimated tons per 8-hr. shift per loader in room slabbing.....	250	300	300	300	300
Width of room before slabbing (coal 6 ft. high).....	22 ft.	22 ft.	22 ft.	22 ft.	22 ft.
Length of room beyond first room parting.....	450 ft.	450 ft.	450 ft.	450 ft.	450 ft.
Number of slabbing cuts from one side only of each room.....	3	3	4	5	6
Final width of rooms after slabbing.....	40 ft.	40 ft.	46 ft.	52 ft.	58 ft.
Final width of room pillar remaining.....	18 ft.	18 ft.	18 ft.	18 ft.	18 ft.
Required number of feet of room entry to develop one section.....	672 ft.	840 ft.	930 ft.	1,020 ft.	1,110 ft.
Required number of calendar days to develop one section.....	112 ft.	112 ft.	112 ft.	112 ft.	112 ft.
Number of 8-hr. shifts per day required on development.....	1	112 day shifts 28 night shifts	112 day shifts 43 night shifts	112 day shifts 58 night shifts	112 day shifts 73 night shifts
Number of days per section on room driving.....	75	75	75	75	75
Number of days per section on room slabbing.....	37	37	37	37	37
Length of slabbing area = length of room driven on development + room extension.....	520 ft.	520 ft.	520 ft.	520 ft.	520 ft.
Average daily output from sections A, B & C.....	1,500	1,800	2,100	2,400	2,700
Average daily output from each machine.....	166	200	210	218	225

Note: Production from entries not considered. Extra loaders in conditions Nos. 3, 4 and 5 to work continuously on slabbing being transferred progressively with slabbing operations.

In Layout No. 1 three mechanical loaders are employed in entry A, three in entry B and three in entry C; there being twelve rooms in each section. Nine loaders are provided for the three "room sections." In Layout No. 2 there are three mechanical loaders employed in entries A, B, and C respectively, as in Layout No. 1, but there are fifteen rooms in each section. As before there are nine loaders for three "room sections." In Layout No. 3 the conditions are the same as in Layout No. 2, except that the slabbing is performed one more time

than in the Layout No. 2 and one extra loader is provided for three room sections. In Layout No. 4, the conditions are as in Layout No. 2, but two more slab cuts are made, that is, the slabbing is carried 12 ft. further. Two extra loaders are provided, so there are eleven loaders for three room sections. In Layout No. 5 again the conditions are as in Layout No. 2, but here 18 ft. more is slabbed off the pillar than in Layout No. 2; three extra loaders or twelve in all are used for the three room entries.



have twice the tonnage in slabbing that they have in room driving, the total output from a number of machines will vary from day to day according to the number of places available for the more advantageous loading. For example, a certain section might produce 500 tons per day for 20 consecutive days, then 1,000 tons per day for 10 days, then drop back to 500 tons again and repeat the cycle. This state of affairs if not balanced from some other source would be highly disconcerting to the sales organization.

#### UNIFORM STANDARD OUTPUT APPROXIMATED

To assume a probable case, it is possible to make a layout so as to anticipate the objection mentioned and standardize on a certain average daily output. If this is done, the transportation problem will be similar from day to day. Likewise, the average output per machine may be calculated in a more satisfactory manner.

In the accompanying figures, in the captions of which brief explanations have been incorporated, an attempt has been made to demonstrate at least one method of arriving at a concrete working plan that will bring about a constant daily tonnage where both room driving and room slabbing are employed.

Five different sets of conditions have been considered, as outlined in Table I, and the plan and equipment theoretically adjusted to each. No dimension, be it room width or length, has been assumed without considering its relation to the average capacity of the loaders and the thickness of the coal worked. Both these conditions will vary in different localities, but they must be determined accurately before the most advantageous layout can be planned. This is none the less true for hand loading.

Taking account of tonnage, the question of what a loader will do under various conditions and what this or that mine is getting from them are two distinct considerations. It has been amply demonstrated that machines are on the market that will load two tons of loose coal per minute, be it slack, run-of-mine, or lump. The quantity that machines are actually loading under practical working conditions in the mines is, generally speaking, the measure of the ability of the mine management to produce loose coal at the face and transportation to remove it therefrom.

#### CAN SHOOT COAL HEAVILY YET INEFFECTUALLY

The opinion has been expressed that in order to obtain satisfactory coal for mechanical loading it is necessary to resort to heavy blasting, thus increasing the percentage of fines. On the contrary, holes improperly placed and overcharged often result in a fall of coal which, although so shattered as to leave little if any lump, is so tightly wedged between the room ribs that a mechanical loader cannot economically dislodge it.

Accepting this fact then, that machines have been perfected capable of satisfactorily loading loose coal at the rate of several hundred tons per eight-hour shift,

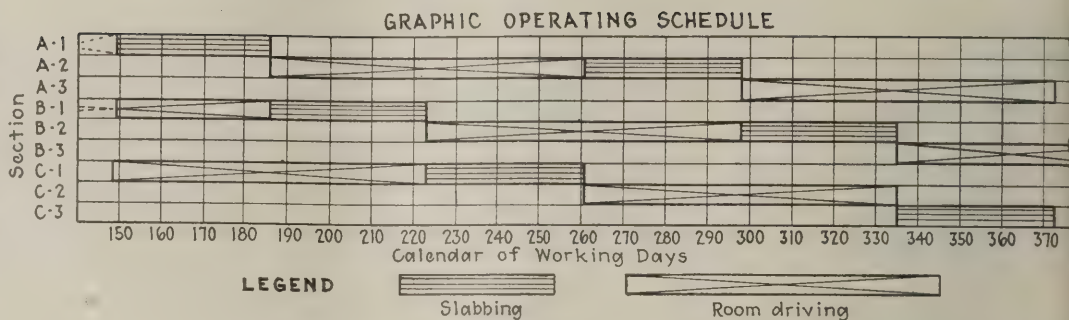


Fig. 2—Graphic Operating Schedule for Keeping Track of Slabbing Mine

By planning the slabbing cycle as illustrated the tonnage obtained in any day throughout the entire production period remains constant. Once a territory has been developed according to this plan,

there should be, under normal conditions, no interruption to or decline in output until arrival at the boundary of the assigned area. A practically uniform output is thus assured.

it certainly would appear logical to spend time and money commensurate with the possibilities involved to develop a mining process that will suitably prepare the coal for a light and portable loader, various types of which are already on the market.

### What Shall We Do When Coal Is Gone?

At a session of the British Association for the advancement of Science held in Toronto, Ont., Prof. F. G. Donnan, of University College, London, said that when coal and oil are exhausted new forms of fuel will be obtained from common salt. Where water power exists near beds of salt (sodium chloride) the power will be turned into electricity and used to obtain chlorine from the salt, the chlorine gas to be transported to industrial centers for fuel.

J. Alexander, a New York chemist, proposed the alternative solution that water-generated electricity should be used to break up water into hydrogen and oxygen, using both gases for heating, and perhaps also using the hydrogen in internal combustion engines. It was pointed out that millions of horsepower were going to waste because of difficulties of transmission which might be overcome by either of the two schemes suggested.

Neither suggestion seems as likely to be effective as the transmission of electricity in view of the expense of transporting gases even in pipes.

### Utah Fuel Co. Makes No. 2 Mine Safe

On July 21 the Utah Fuel Co. reopened No. 2 Mine, where on March 8 a disastrous explosion occurred killing 171 men. B. W. Dyer, of the U. S. Bureau of Mines, with other experts made a thorough inspection before the reopening, reporting that an analysis of the return air showed 0.12 per cent of methane and a volume of 175,000 cu.ft. of air per minute. The mine liberates about 300,000 cu.ft. of methane every twenty-four hours. Every place in the mine is well ventilated. All working places and practically all places opened in the mine have pipe lines extended to the face so that every portion of the mine can be wetted down, and the places which are to be operated are equipped so that the men working there can keep their places wet.

Rock-dust barriers have been placed in right and left entries off the dips. Telephones are being installed throughout the mines. Company men will load and tamp all holes after the men are out of the mine and shots will be fired after everyone, shotfirers included, have reached the surface.





*Power Plant of Susquehanna Collieries Co., Lykens, Pa.*

## Susquehanna Collieries Co. Burns Pulverized Anthracite Slush at Lykens, Pa.

One of the First Power Plants to Utilize Anthracite Slush in Pulverized Form—Coal Mixed with 75 per Cent Water Pumped to Plant—Boiler Plant Contains Six 5,000- and Six 6,000-Sq.Ft. Water-Tube Boilers—Present Generating Capacity 6,400 Kw.

**T**HE successful application of pulverized coal in the firing of stationary boilers and the ability to burn in pulverized form practically any and all grades of coal with an approximately equal degree of thermal efficiency, have brought about the recent utilization of coal that heretofore had practically no market value.

Constituting a large percentage of this class of coal is the small-sized anthracite (smaller than No. 3 buckwheat) which up to a recent date was considered waste incident to anthracite mining and was in many cases allowed to be washed into nearby streams.

The accumulation of this fine coal has been going on many years until mountains of this material are piled around the collieries. The beds of the rivers and creeks are also lined with the material. The total quantity, probably running to nearly one hundred million tons, has washed down from the mining regions.

As all fine anthracite is referred to generally as culm, it might be well before going farther to point out the difference between culm and slush. A culm bank, as it is known in the mining region, contains all waste products from a colliery and consists of, depending upon its age, any coal that was rejected as unmarketable at the time, with slate, rock, breaker refuse and in the majority of cases ashes from the boiler plant. A slush bank consists entirely of coal relatively free from any rock or slate, but so fine as to be unmarketable; the fine reject from breaker or washery; a coal passing the smallest coal screens, sometimes called sludge and silt

from its condition when wet. Slush is being made at the present time from all breakers and washeries that are re-treating culm banks.

The new power plant of the Susquehanna Collieries Co. erected in 1920 and 1921 to supply current to its Short Mountain and Williamstown collieries, was the second commercial installation to use anthracite slush in powdered form, the first and smaller installation having been built by the same company at its Lytle colliery in 1918.

### EXISTING PRACTICES WERE HIGHLY EXTRAVAGANT

At the time this plant was put into operation, the steam for operating the Short Mountain colliery was being supplied by three boiler plants with a total of nine water-tube boilers of 5,000 sq.ft. of heating surface and three locomotive-type boilers of 1,000 sq.ft. of heating surface. At the Williamstown colliery five boiler plants were in operation, containing a total of fourteen water-tube boilers of 5,000 sq.ft. of heating surface and three locomotive-type boilers of 750 sq.ft. of heating surface. The combined operating forces of these eight plants, including firemen, water tenders, ash men, coal passers, boiler cleaners, etc., totaled 154 men, and the coal consumption for the year 1917 amounted to 203,631 tons, the average boiler efficiency in these plants being around 35 to 40 per cent. The fuel burned was all commercial coal, about 90 per cent of which was No. 3 buckwheat and the remainder No. 2.

During the latter part of 1917 an exhaustive study



was made as to a means of reducing the power cost at the several collieries of the company, and this led to an investigation into the possibilities of burning anthracite slush in pulverized form in the new power plants which constituted part of the program of rehabilitation.

At this time the problem was discussed with the Fuller Engineering Co. and the mining company made an appropriation for an experimental plant consisting of a 2,500-sq.ft. Babcock and Wilcox boiler, a 42-in. screen-type pulverizing mill and a rotary drier that the mining company had on hand. This research work was continued from the latter part of 1918 to the end of 1920 under the supervision of R. M. Walker, consulting engineer of the mining company, with C. W. Lotz, combustion engineer, in direct charge of the work, and it might be stated that the ultimate success of burning pulverized anthracite is largely due to his work.

the fuel to ignition temperature after leaving the burner in the furnace proper, and also demonstrated the importance of introducing the coal into the furnace in the form of a narrow curtain, which method, it might be recalled, has since become more or less standard practice.

With these preliminary studies completed and the possibilities of a material saving in power costs assured, it was decided to adopt this method of firing in the new plants for which plans were already under way.

#### PUMPING SLUSH CHEAPER THAN CONVEYING

The slush, with a consistency of about 25 per cent coal and 75 per cent water, is pumped from the breaker and washery a distance of approximately 2,500 ft. and against a head of 400 ft., to a point on the side of the mountain adjacent to the power plant. It may appear

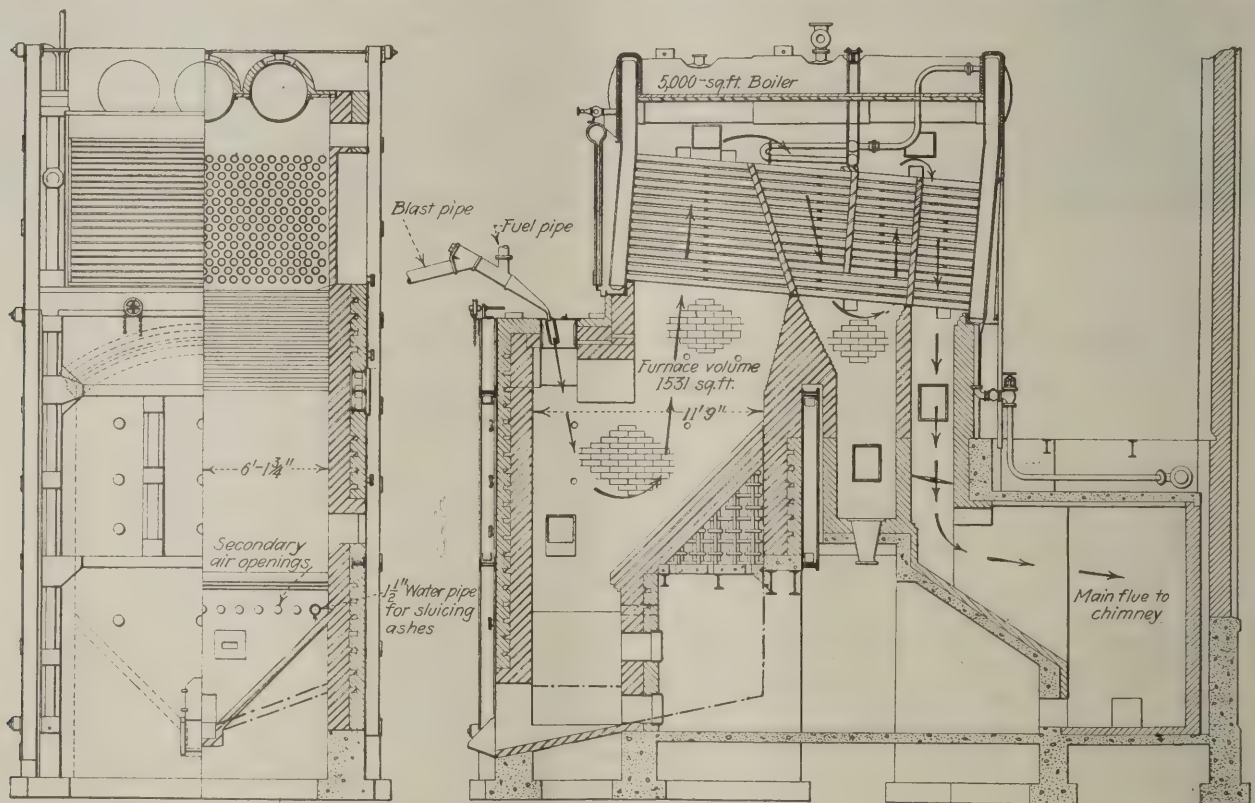


Fig. 5—Cross-Sectional View of Boiler, Furnace and Setting

The 45-deg. slagging shelf recently has been removed. Changes made in the combustion chamber are indicated by dot-and-dash lines. The boiler headers are approximately 13 ft. above the floor of the combustion chamber. Long narrow burners are located in the top of the front extension of the walls.

For this experimental work the combustion chamber was extended out in front of the boiler about 32 in., and was made the full width of the boiler and about 9 ft. deep, with approximately 13 ft. between the boiler headers and the combustion-chamber floor.

The first trial was made with a round-type burner located in the furnace front about 6 ft. from the bottom. As this resulted in heavy slagging and destruction of the ignition arch and brickwork of the rear wall, further experiments were made with several types of improvised burners located at different elevations in the furnace front, the final trial being conducted with a long, narrow burner constructed of sheet iron and placed in the top of the combustion-chamber extension. The secondary air in all cases was introduced through openings in the rear wall directly above the furnace bottom. These experiments showed that low-volatile fuels could be burned only in suspension by preheating

that much power is expended in pumping 3 lb. of water to each pound of coal over this distance, but as the slush leaves the breaker and washery with waste water, it was considered more economical to pump the water and slush to the plant and then dewater it than to convey the solid coal the same distance.

At the plant the coal is first discharged into two dewatering devices consisting of two concrete tanks and four slow-moving drag scrapers. The latter remove the coal from the tanks and discharge it directly to two coal stackers, one of which is shown in Fig. 3.

The stackers, each of which consists of a 90-ft. boom carrying a drag scraper, were developed in the consulting engineering department by E. B. Worthington, mechanical engineer, and provide a practical and economical means of storing coal.

The lower side of the trough in which the scraper carries the coal is fitted with a number of sliding gates,





Fig. 1—Screw Conveyors Operating Over the Pulverized-Coal Hoppers

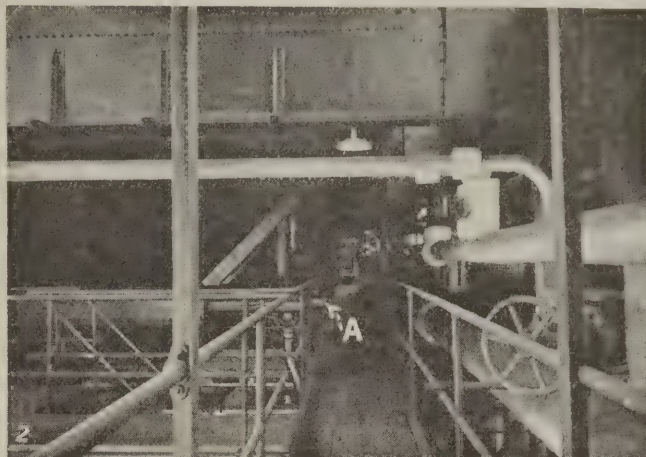
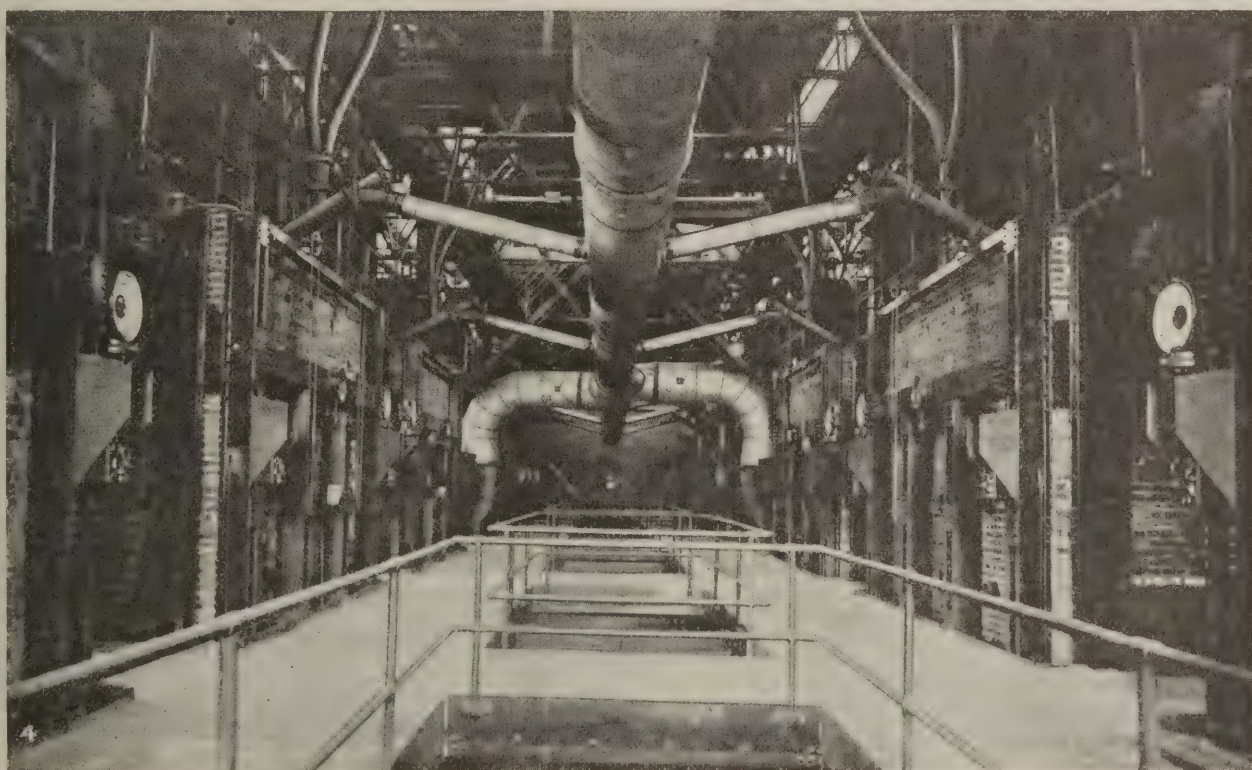


Fig. 2—Coal Bunkers and Screw Feeders Above Operating Aisle



Fig. 3—One Unit of the Dewatering and Coal-Stacking Equipment

Fig. 4—Central Boiler Operating Aisle; Six Boilers on Each Side





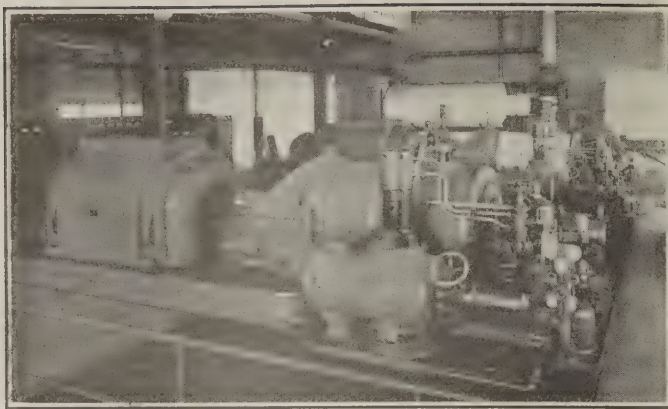


Fig. 6—Two 3,200-Kw. Turbine Units

The present generators consist of two units but sufficient space is available for a 7,500-kw. turbo-generator which will make this mine power plant one of the largest in the region and even larger than many public utility stations.

permitting the coal to be discharged at any point along the boom. The boom is arranged to swing through an angle of 180 deg., and this provides facilities for stacking approximately 100,000 tons with the two units in operation. The general arrangement of the dewatering and stacking and reclaiming equipment is shown diagrammatically in Fig. 9. Upon leaving the stacker the coal contains about 30 per cent moisture, but after standing in the pile for about 48 hours the moisture has decreased to around 10 per cent.

The reclaiming of the coal from the storage pile is accomplished by a scraper bucket operated from a motor-driven drum hoist, suitable anchor posts being arranged around the pile. The drum hoist is mounted on a turntable with a central discharge, and this feature permits swinging the drum in line to suit any position in which the scraper may be required to operate, the entire operation of dewatering, stacking and reclaiming the coal requiring the services of only two men.

From the discharge hopper of the drag scraper the coal is conveyed by a scraper-type conveyor to a distributing conveyor above the raw-coal bunkers in the pulverizing house. From the bunkers it is passed to two 25-ton per hour double-shell driers, hand-fired. Passing through the driers, the moisture in the coal is reduced to about one per cent.

#### EIGHT PULVERIZERS OF TWO TYPES EMPLOYED

The coal as discharged from the driers is elevated into a concrete dry-coal bin located over the pulverizing room and arranged with suitable discharges to eight 42-in. screen mills, four of which are belt driven from vertical motors and four geared-type direct connected to horizontal motors.

The screen test of the slush as fed to the mills runs about 70 per cent through a  $\frac{3}{4}$ -in. screen, and the finished material leaving the mill runs about 82 per cent through a 200-mesh. It may be recalled that this is a much finer product than is generally considered necessary with bituminous coal. This fine grinding, however, appears necessary with anthracite slush in order to obtain proper ignition owing to the low volatile content of 8 per cent as compared with bituminous coals having 30 to 40 per cent volatile.

The mills discharge the pulverized coal into screw conveyors, which in turn feed into duplicate systems of bucket elevators which carry the coal to a point

above the boiler bunker level whence it is conveyed by duplicate screw conveyors to the fuel bins above the boiler aisle. As each conveyor is fitted with discharge chutes to each fuel bin, as shown in Fig. 1, one conveyor only is operated at a time, thus leaving one as a spare. The total capacity of the pulverized-fuel bins is approximately 250 tons, or a supply sufficient for a 24-hour full load of the station.

Referring to Fig. 4, the boilers are arranged in two rows, with six boilers on each side of the operating aisle. There are six 5,000-sq.ft. horizontal water-tube boilers equipped with superheaters and operated at 190 lb. pressure, and six 6,000-sq.ft. boilers of the same type without superheaters operating at 145 lb., all the boilers being designed for 200-lb. working pressure. The normal pressure of 195 lb. carried on six of the boilers was selected to suit the main generating units, and the pressure of 145 lb. carried on the remaining boilers was governed by the local colliery, in which there are two 48x72-in. hoisting engines and two 3,000-cu.ft. steam-driven air compressors and underground pumps. Provision has been made, however, for operating any of the boilers on either service by making the steam header in the form of two connected loops with sectionalizing valves between each boiler.

A cross-section of the furnace and boiler setting is shown in Fig. 5. The combustion chamber is extended out in front of the boiler sufficient for a good burner setting. It will be seen that the design of the combustion chambers is a departure from the usual practice. The floor of the chamber slopes at an angle of 45 deg. from the bridge wall to within 4 ft. of the front wall, the narrow portion at the front of the chamber serving as an ashpit. On the 5,000-sq.ft. boilers the furnace volume is 1,531 cu.ft., giving a ratio of square feet of heating surface per cubic foot of furnace volume of 3.26. On the 6,000-sq.ft. boilers this ratio is 3.76.

The ashes are removed from the pit by sluicing, the discharge from the mine pumps being used for this service. The bottom of the pit slopes from the side walls into a trough at the center. Water is led into the furnace at each side wall and flows down the inclined floor, carrying the ash with it. From the central trough the ash is washed out through a swinging door to a common duct below the central aisle and discharged into a suitable space outside the building. The sloping floor of the ashpit is grooved in order to reduce the water surface exposed to the radiant heat of the fur-

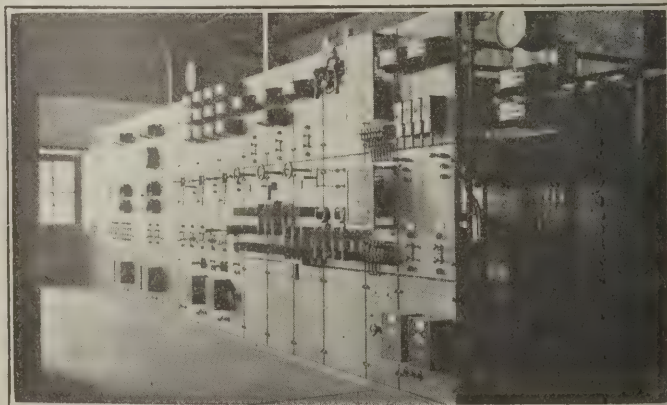


Fig. 7—Main Switchboard Controlling the Electrical Energy

This is located on the turbine-room floor and supplies power to the Short Mountain and Williamstown collieries.



nace. The heavy dot-and-dash line shown in the section Fig. 5 indicates the change recently made in the combustion chamber of one of the boilers, but at the time of writing no tests have been conducted to determine what improvement has been made in the efficiency of the boiler.

Each boiler is fired by one burner located in the arch forming the top of the combustion-chamber extension. The opening in each burner is approximately 2½ in. wide by 5 ft. 2 in. in length. Each burner discharges directly against a hinged deflector (see Fig. 8), the position of which is controlled by a chain wheel and screw operated from the floor. In this way the flame travel can be adjusted to suit the load condition. Provision is also made in the cast-iron housing surrounding the burner for admitting secondary air, a damper being fitted to the top of the housing and operated from the floor.

SIX BOILERS IN A ROW SERVED BY ONE STACK

The feeders, two for each burner, are mounted directly below the pulverized-fuel bins with the controls conveniently located on the boiler fronts. The primary air is supplied by two motor-driven fans located between No. 3 and No. 4 boilers of each row and discharging midway into the primary air header, which is carried along the length of the boiler room directly above the operating aisle.

Each row of six boilers has a single stack with two breechings, the former in the center with three boilers on each side. The stacks are radial brick 12 ft. in diameter at the top and rise 175 ft. above the base.

The present installed turbo-generator capacity is 6,400 kw. in two units of 3,200 kw. each, provision being made in the station layout for an additional unit of 7,500 kw. The condensers are of the jet type and are mounted directly below the turbine exhaust, a spray pond being used for cooling the injection water.

The feed water to the boilers is supplied by three

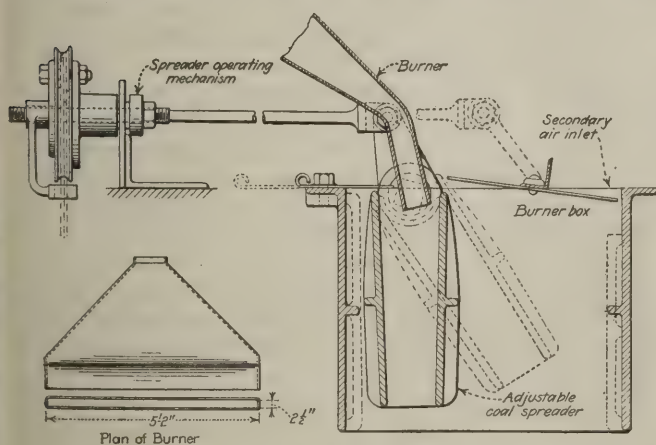


Fig. 8—Pulverized-Coal Burner and Spreader

Each burner discharges against a hinged deflector which permits the direction of the flame to be varied as the load changes. Secondary air may be admitted to the burner housing by means of a damper controlled from the floor.

centrifugal pumps, two of which are motor-driven and one steam-driven. The pumps are in the turbine-room basement directly below the feed-water heater. Exhaust steam for heating the feed water is supplied by the removal pump of each condenser and the discharge of the rado-jet air pumps. The exhaust of the two 3,000-cu.ft. air compressors at the colliery is also returned

to the plant, and any excess then is exhausted to the air.

The preparation plant is operated during the sixteen hours off-peak period that the collieries are idle. During this time sufficient coal is prepared for the twenty-four hour operating period of the station.

The cost of preparing and handling the coal at the Lykens plant averages about 60c. a ton over a twelve-

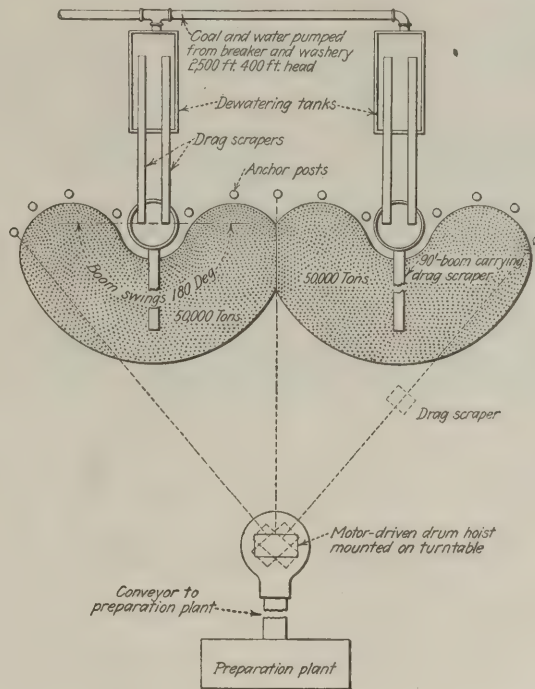


Fig. 9—Fuel Transporting and Dewatering Equipment

Water and slush from the breaker and washery is pumped into two concrete tanks from which the coal is removed by two coal stackers. From storage it is taken to the pulverizers.

month period. This includes operating and maintenance, labor and supplies, including power and superintendence, but not investment charges. The cost of pulverizing alone is about 24c. a ton.

The cost of preparing and handling the coal here given may at first appear high, but when it is remembered that the plant is being operated considerably below capacity, and that the cost of pulverizing and the maintenance charges on the mills increases rapidly with the degree of fineness of pulverization and the percentage of ash (the coal in this case is pulverized to a fineness of 82 per cent through a 200-mesh screen and contains 20 per cent ash) and that the pulverized coal is conveyed a distance of 500 ft. from the preparation plant to the bunkers above the boilers, this cost is not excessive.

The plant was designed and constructed under the direct supervision of R. S. Walker, consulting engineer of the M. A. Hanna Co. of Cleveland, which operates the Susquehanna Collieries Co., and his associates, A. J. Cayia, his assistant, E. B. Worthington, mechanical engineer, C. H. Matthews, electrical engineer, and C. W. Lotz, combustion engineer. Co-operating with these were H. L. Reese, electrical engineer, and W. E. Weinck, construction engineer, of the office of R. A. Quin, manager of the Susquehanna Collieries Co. at Wilkes-Barre, Pa., and E. A. Van Horn, superintendent of the Lykens Division of the same company. The plant is operated under the direction of H. B. Jones, chief station engineer. The H. C. Felver Co., of Cleveland, Ohio, constructed the plant.





## Keen Interest in Mechanical Loaders Signalized Meeting of Institute at Rock Springs, Wyo.

Shovel Propelled by Hydraulic Ram with Frame Held to Its Work by Water Pressure Said to Have Remarkable Digging Qualities—Mine Fires and "Hush! Hush!"

Policy Discussed—Committee Advocates Sprinkling!

**N**EXT TO ROCK dusting, mechanical loading methods and equipment elicited the principal attention of the members of the Rocky Mountain coal Mining Institute at their summer session, Aug. 7-9, in Rock Springs, Wyo.

Machine loading has reached a fairly high point of development at the Union Pacific mine at Hanna, Wyo. Superintendent T. H. Butler described the operation of Joy and Thew loaders in the 32-ft. seam of lignite at No. 4 mine. Joy machines load out the lower 8 ft. of this coal from 32-ft. rooms driven on the strike of the seam which pitches from 14 to 17 deg. Eighteen feet of the remaining 24 ft. are shot down and loaded out by the Thews. The Thews are operated by one man on the machine and two trimmers. Four men are used with each Joy, because the large lumps have to be broken and the tight coal has to be pulled down. Fewer men than this would greatly reduce the tonnage. The Thews are averaging 240 tons a day and the Joys 104 tons.

Mr. McAuliffe, president of the company, supplementing Mr. Butler's paper, said the Thews are money makers for the company, loading coal for 52.4c. per ton, which is a saving of about 30c. a ton. The Joys load at a cost of 72c., which is a saving of 11c. He said the Joys helped to make the Thews good earners for the company.

At the Reliance No. 1 mine of the company two Joy machines working in rooms on fairly steep pitches are able to average only about 72 tons daily, but in spite of handicaps they are cutting at least 1c. a ton from

the cost of loading. The institute visited this mine and saw these machines work.

Mr. McAuliffe took a rap at the institute members for not being franker and more liberal with the whole truth of every subject discussed. He said his company is perfectly willing to tell anybody anything about Union Pacific practice that will help them in coal-mine operation and he hoped other members of the institute would do the same thing.

Secretary Benedict Shubart replied that machinery men in the institute were "sales engineers" not "peddlers" and cannot in decency tell what they know about the results attained by mining companies. He said the companies must reveal their own results, if the mining public is to be informed.

The discussion then veered to the question whether loading machines increase slack. Mr. Butler said that the Union Pacific Coal Co. did not keep such data, for all the company's mines produce mine run. However, he does not think the slack proportion has been increased at Hanna. C. M. Goddard, representing the Joy Machine Co., said it is the shooting of the coal and not the machine itself that increases slack.

The coming of loading machines is going to produce at least one important change in mine operation, said T. H. Stroup, Superintendent of the Clear Creek mine of the Utah Fuel Co. It will make the operator take full responsibility for what takes place at the face, and at that point, he said, is to be found the heart of most mining problems. Heretofore, he remarked, there has been too great a tendency to blame everything at the face upon the miner.

In coal mines he thinks about 75 per cent of the men have been attaining only about 50 per cent efficiency,

NOTE—Headpiece shows Rocky Mountain Coal Mining Institute presenting solid front to photographer at Rock Springs, Wyo. A previous article on the meeting of the institute appeared Aug. 14 on pp. 227-229 entitled "Rocky Mountain Men Strike New Note in Dusting."



for that very reason. Coal could take a leaf from the book of metal mining in this particular, for there Mr. Stroup has observed much closer attention paid by the company to face operations. As a result, loading at some big metal mines costs only 16c. a ton, yet loaders are happy, for they are making \$35 a week. They are kept busy, and their tonnages are high. Regular periods of rest are provided but the mines are operated so systematically that loaders lose no time needlessly.

Adaptation of loading machines to present systems of mining and not a radical revolution of methods to fit machines, is what S. W. Farnham, chief engineer of the Goodman Manufacturing Co., looks forward to as he scans what appears to be the future of underground loading. He told the institute that the famous V-system and some other efforts to attain tremendous tonnages do not look good to him because of the difficulty which must be met in cleaning such volumes of coal.

His idea of the proper loading machine is either a machine that merely loads and must have all its digging and loosening of coal done for it, or else a big strong digging machine which actually will tear loose tight coal thus producing more big lumps with less shooting. Any machine in the middle ground between these two extremes, will fail he thinks. The fact that so many mining men appear to expect digging of middle-ground machines is one reason why many machines that are already in the field have been scrapped.

Mr. Farnham holds that mechanical loaders cannot replace hand labor. Even hand loaders seldom actually load coal over half their working time. The rest of the time is devoted to track work, loosening tight coal, trimming cars and a score of other activities. He cannot see how loading machines ever can be expected to load all the time.

For that reason he does not believe that machine pay ultimately will be on a day basis as it is now in most of those states using machines. When it is on a tonnage basis, the time consumed in work around the machine will be less and the machine will load its maximum tonnage. During these days of experimentation with machines, however, he recognizes that daily wages may be best because tonnage scales fixed now might be extravagant for the machines which eventually may be developed. Scales once established in union fields are hard to change.

He reported to the institute that, after visiting most of the loading operations in the country, he estimated that the average tonnage being loaded by machines is about 70 tons daily and that the greatest limiting factors are breakdowns and the difficulty of getting cars to and from the machines.

Reverting to the V-system, he said the disadvantages were high cost of installation, difficulty of moving the equipment, danger of crushing at the face, the necessity of changing the whole system of mining, the difficulty of hand loading large lumps into conveyors and the need for extensive supervision.

Mr. Farnham described to the institute the new Goodman shoveling machine and showed pictures of it. The machine is about to be put on the market after extensive trials in a salt mine in New York state. It loads with a large shovel propelled by a hydraulic ram. This shovel, which is operated from a revolving turret, discharges coal gently into cars by the forward propulsion of the rear wall of the shovel. The machine is prevented from sliding backward by a hydraulic prop which is readily adjusted against roof and floor. It requires 6 ft. of headroom.

Charles Gottschalk, of Evansville, Ind., described what Indiana had learned about mechanical loading where a number of companies have been working various types of machines. One of his conclusions was that, until loading machines attain high daily tonnages, the problem of getting cars up and away from the machine is much less of a factor in production than that of proper shooting.

Mine fires give much trouble at the Reliance mines of the Union Pacific Coal Co. Superintendent Thomas Foster described various methods that have been used to check them. In one fire zone an effort to load out the fire failed, so sand packs were tried. They were built of timbers and boards behind which was left a space of 2 or 3 ft.

between the wooden wall and the coal rib. This method gave good results except that the sand tended to settle and had to be watched at the top.

The same method is being used to check another fire which previously burned across entries in the top coal and otherwise insisted upon spreading. Water poured through holes drilled in from the surface was of no avail for, when the water struck the hot rock over the burning coal, the rock turned to mud and choked the hole. The top coal is now taken down in entries which the fire is approaching, and sand packs are built to the cap rock. Fires in the Reliance mines from 1915 to 1924 cost \$118,681 or a shade over 3c. per ton of output. George Brown of Cumberland, Wyo., who has been battling bumps in the Union Pacific mines at that place since 1918, recited some of his experiences.

Eugene McAuliffe, president of the Union Pacific Coal Co., appealed to the mining fraternity to know more and guess less in the business of operating mines. He thinks there is altogether too much rule-of-thumb practice and too many men are bound by precedent and custom. Many mining men are satisfied with their ventilation if they think they have the right size and type of fan, the proper air input and water gage. But do they know definitely that enough air reaches the face? Mr. McAuliffe doubts if they do.

He questions whether they maintain ventilation maps of their workings and keep definite records of air delivered to the active spots in the mines. He doubts also if the average mining man realizes that if one per cent gas content is shown in an analysis of the return air from a mine supplied with 100,000 cu.ft. of air per minute, the total gas generated in that mine daily is no less than 32.47 tons. This may be harmless enough

### McAULIFFE ADVOCATES LESS SECRECY

**T**HOUGH the Union Pacific Coal Co. under Mr. McAuliffe's leadership and that of his predecessors has made great strides in the adoption of new methods, he believes the mining public should receive the full benefit of the results of all the pioneer work done in those mines and elsewhere and calls for more frankness in describing operating results, that industry may progress and every one may be benefitted. The Union Pacific Coal Co. at the Rock Springs meeting gave much information regarding its practices in mine fires and machine operation.



when diluted in the proportion of one to 99 with air, but who knows positively that his ventilation system is adequate at all parts of the mine to make that dilution? Proven facts is what Mr. McAuliffe thinks the coal industry needs, and he appealed to the institute for closer adherence to them.

#### COMMITTEE NOT ORTHODOX ON DRY ISSUE

The institute adopted without debate the report of the institute's safety committee, over which there was some hot argument at the winter meeting in Denver. The report condemned shooting off the solid, opposed the use of black powder in any mine where coal is cut or sheared and urged that no shooting be done when men are in the mines. It favored electric safety lamps in every mine that shows gas. It advocated careful use of water on cutter bars, better protection of bare wires and electrical equipment. It charges "at least 25 per cent of present-day explosions" to electricity.

The report proposes a long list of methods and devices for making ventilation more thorough and dependable.

To reduce dust it suggests that under certain conditions longwall be used instead of room-and-pillar mining, advocates more shot holes and lighter charges and that water be sprinkled regularly on roadways and on loaded cars. It recognizes the value of humidification of intake air by steam but does not insist upon its general adoption because of the expense accompanying the introduction and operation of such installations.

The report advocates rock dusting in mines having dangerous dust or both dust and methane. It opposes the installation underground of any electrical equipment or apparatus that is not approved by the Bureau of Mines.

"Miners rarely have any adequate idea of what constitutes safety in coal mines" reads the report, "and this applies equally to the experienced miner and to the man who has worked in the mines only a few months." So an extensive campaign of education is advocated, to be supported by mining companies, in conjunction with the government and the states. The report also covers many other points of lesser importance.

### Where Do Safety Bulletin Boards Attract Most Attention?

**M**INE managers, chiefly through the preachings of safety men and institutions, are well aware of the value of bulletin boards as a medium of educating the miner in safety; but in most cases they do not place the bulletin boards where they will be most read. C. E. Reynolds, superintendent of the Springdale mine of the Allegheny Pittsburgh Coal Co., near Pittsburgh, claims that the most frequently read bulletin boards are those that are posted at the junctions of main manways in the mine and at the important corners of streets in the mining town.

When miners are on their way in the mine to or from work, each time they pass a bulletin board at an important junction point their attention is attracted, for a moment at least, to the illuminated bulletins. Old bulletins which they have passed day after day register no distinct impression upon them, but—"What hold a new series of bulletins; let's stop and read them." That really is the psychological effect of brightly lighted

educating miners in safety. It is she who worries more than the man over his life and limb while at work in the mine, for her bread and butter and that of her children, if she has any, depends upon his



**Bulletin Board in Mining Town of Logans Ferry**

It is just as important to educate women and children to safety as it is to teach the men, for the former have a strong influence on the latter. It is wise to post a number of such boards in each mining town.



**Illuminated Safety Bulletin Board**

This bulletin board is certain to attract attention, for it is located on a much-traveled manway. These men are leaving the mine after a day's work. If one of them stops at this point for his "buddy" who may be farther down the line, he is likely to read the bulletins. Note the cleanly swept bottom along this manway. It is kept equally as clean for miles.

bulletin boards in the mine. The same boards in daylight in and around the bathhouse, at the shaft or pit-mouth, are passed unnoticed.

Woman can be made to play an important rôle in

employment every day that the mine runs. It has been observed time after time, that a man who is injured in a mine accident quarreled with his wife before leaving home that day. Her quarrels with him often are an indirect cause of his being injured, but fortunately if she is the right kind of wife she has an equally strong influence in making him careful.

Knowing this, Mr. Reynolds has erected several bulletin boards on the streets of the village of Logans Ferry. During the day the women and children are often seen reading the bulletins, which if placed about the mine plant would not come under their observation. At night man and wife, when walking together, are attracted to the lighted bulletin board led by the greater curiosity of the women, and the husband gets a brief lecture on safety whether he wants it or not. More bulletin boards should be provided in the mine and in the town.



# How Should Loading-Machine Workers Be Paid?

Here Is a Presentation of the Arguments on Both Sides of the Case—for a Tonnage Scale and for a Daily Wage—by T. A. Stroup, Mine Superintendent, and S. W. Farnham, Mining Engineer

*Ever since machines were devised for underground loading of coal, authorities in the industry have differed on the question: How should loader operatives be paid? The United Mine Workers officials, thinking that thereby the men would get a bigger share of the benefits from new mining machinery, have held out for tonnage rates. Operating men have taken both sides, but mainly they have favored day wages. Thus far in the development of loaders the operators have had their way, but the day scales now in effect in all union fields of this country are fairly high. In Illinois and Indiana the scale is \$10.07—although only Orient No. 2 mine is working the machines in Illinois—and Wyoming's rate is \$11.50.*

## Tonnage Pay Is Coming

"Loading machine operation eventually is sure to be paid for on a tonnage basis, I believe," said Mr. Farnham, "because, by that method of compensation, the machines are most likely to be worked nearer to their full capacity and, as another important factor, the attendant work around a loader will be more expeditiously done. There is no need to expect any loading machine to be operated steadily eight full hours every day. It simply cannot be done. No matter how good the machines of the future are, there always will be much necessary work connected with their operation, other than the running of the machine and this will always cause delays. Why even where loading is all done by hand, the men spend only about half their time actually shoveling coal into pit cars. How can it be greatly different when machines do the work?"

"So, bearing in mind that fact that there is, and always will be, a good deal of this sort of labor—trackwork, or moving of conveyors, shifting the loader about, cleaning up coal that overflows the car or misses the conveyor, loosening tight corners and a lot of other essential jobs—isn't it fair to assume that the miner who is paid only for the number of tons he loads is going to see that the loading goes on the maximum number of minutes? And if he is paid by the day, he will not be so speedy with all this aside work, will he? That is why I believe the tonnage basis will be adopted some time, although the time for it has not yet come.

"There is sound logic in the argument that tonnage scales ought not to be fixed right now, because the loading machine is developing fast and scales that are fair today would be outlandish tomorrow. But we should not get the idea that tomorrow or next year or five years from now is going to see the culmination of loader development. I don't think we will ever reach a point where we can say: 'Now we have the loader; it is time to make a tonnage scale.'"

*Most operators of the country foresee the adoption of loading machines before long in almost every mine. Therefore, the question of wage scales is vital. Two interesting views on the issue were expressed recently in the West by men of life-long experience in coal and whose opinions are respected the country over. T. A. Stroup, superintendent of the Clear Creek Mines of the Utah Fuel Co., believes in the day wage and is sure the country will stick to it. S. W. Farnham, mining engineer of the Goodman Manufacturing Co., believes a tonnage scale will inevitably be adopted for the reasons he sets forth, although he would like to see the day wage perpetuated. Here is what they say:*

## Case for the Day Wage

"I believe in the day wage for loading-machine operators," holds Mr. Stroup, "for several reasons, but the main reason is just this: Loading machines are going to force mine operators to assume full responsibility for what goes on at the face instead of passing the buck to the miner. This means men working at the face are going to be under more direct supervision—which will be easier with machine loading than it is now because of the future concentration of men working in few places.

"This concentration of men is going to play an important part. I am morally certain that the average miner would do more work if he were in a group than he does when he works alone; but even if this psychology failed, there is another important reason why the miner working around a loading machine at the face—and every other man in the whole mine, for that matter—will do more in a day than he does now. He is going to be a necessary cog in a machine. What he does depends upon what every other man in the system does, and what the others do, depends upon him. Don't overlook that.

"This is exactly the thing that makes the plants of Henry Ford such astonishing producers. The employers have devised systems of production which raise to the nth power the factor of interdependence of the workmen. There is a lot of facts at the base of those funny stories about the Ford employee who got fired. When somebody asked him why he lost his job, he replied that he dropped his wrench and before he could pick it up 865 cars had gone by him with the nuts that he should have tightened loose on their threads. They may be telling stories like that on the coal miner after awhile. The operator is being forced right now to develop a much better system in his mine. Heretofore he has been watching the tippie and selling the coal and damning the miner if the coal didn't come out. Hereafter, with money tied up at the face in loading equipment, he will devise ways of running every minute."





## News Of the Industry



### Consolidations and Consumer Ownership Stabilizing the Coal Industry

Many Transactions Being Quietly Consummated—Northwest Should Buy Coal or Consequences May Be Serious—Too Much Optimism Among Producers

BY PAUL WOOTON  
Washington Correspondent of *Coal Age*

Two developments of far-reaching importance are in progress in the coal industry. Consolidations have been effected and are in course of consummation almost sufficient to constitute evolution. The number of captive mines is increasing by leaps and bounds.

When the Harding Coal Commission made its report, in which consolidations were recommended, there was no way of foreseeing that an economic situation would develop within a year which would bring about consolidations to an extent far beyond any hope the Commissioners may have entertained at that time. Under the compelling pressure of slack demand and the prospect of a long period of uninterrupted production increasing numbers of high-cost mines had been forced upon the market.

As many of these transactions are kept as quiet as possible and because there is no centralized point at which figures covering such transfers are available, there is no accurate knowledge as to the extent to which this tendency has progressed. Those in the best position to judge express the belief that the more powerful companies have absorbed a larger number of high-cost mines than is generally supposed. If current rumor has foundation several large deals of this character are about to be consummated.

Before the end of the year, it is predicted, enough mines will have been acquired in this manner to give a new degree of stability to the entire bituminous industry. Normal requirements will be furnished by low-cost mines. The less efficient mines will be held in reserve to be called into production to supply peak periods of demand. In this connection authorities on coal point out that the bituminous industry in the past has taken little advantage of economies of large scale production. The consolidations now being effected, they say, will do much toward setting an example in such matters as improved organization under ground which is regarded by some as one of the weak spots in bituminous operation. Better co-ordination or effort under ground as well as the employment of more engineers and better talent all call for capital expenditures which large interests can undertake and which are

denied to those without such resources.

It is regarded as unthinkable that consolidations of bituminous mines could reach the point where any monopolistic control could be exercised. Even were a consolidation to take on a dominating character in a single district it would have to meet interdistrict competitor. There has been serious discussion of large consolidation among the producers of smokeless coal. Even were it possible to effect such a grouping the industry could do no more than get into the anthracite class but even then its product would be more vulnerable to inroads from substitutes.

Though it is doubted that any unselfish reason could be advanced by coal operators to the captive mine this trend within the industry does not present the same constructive possibilities as flow from consolidations. These mines restrict the market more than they restrict the output. Most of these properties produce for their owners only.

#### Buying Mines at Bargain Prices

Public utilities and the manufacturing interests are taking advantage of the existing situation, just as are the stronger coal companies, to buy mines at bargain prices. Here again the situation is clouded by uncertainty due to the fact that no central agency has the money with which to collect exact information. It is known, however, that the number of captive mines has increased greatly. The aggregate of their output is thought to be approaching two hundred million tons, more than one-third of the annual production. This tendency is believed to be having an appreciable effect on the price of coal.

Officials in Washington continue to emphasize their belief that the people of the northwest have cause for concern for their supply of winter fuel. Unless there is an immediate improvement in the Lake movement the chances greatly favor a serious situation should there be an early descent of winter. The solution of the situation lies entirely in the hands of the consumers as coal must be moved off the docks before additional supplies can be received.

In some official quarters there is a tendency to discount some of the optim-

#### Robbers Hide in Mine

Three desperadoes thought to be the three who robbed the Palisades, Colo., postoffice of \$15,000 on Aug. 2, hid in the mine of the Palisades Coal and Supply Co., with a posse hot on their trail and were still defending themselves in the mine on August 8. The siege of the working attracted the attention of the whole West. The mine was shut down, all openings at the surface were flood-lighted at nights and a heavily armed guard surrounded the place continuously. The posse even entered the mine frequently. But, although it thought they shot one of the three, no captures were made. The sheriff once prepared to gas the men out of the old mine but this plan was vetoed, and the guard stayed on the job while the town looked on.

ism which has been so rampant for the past two or three weeks. They point to the fact that the level of unfilled orders for steel is a particularly important barometer so far as coal is concerned. In May there was a 20 per cent decline in unfilled orders. In June there was a further decline of 20 per cent. In July the decline continued at a slightly less rate—15 per cent. There is reason to believe that August will show a much more favorable figure, but if the situation in the steel industry is indicative of the general trend coal operators are having a hard time figuring where enough demand will originate during the remainder of the year to affect their business materially.

#### May Reopen West Kentucky Mines with Wage Cut

Unconfirmed reports at Louisville, Ky., say that leading coal operators in western Kentucky plan to reopen mines Aug. 25, on a 1917 wage scale, 25 per cent below that effective when about 8,000 miners went on strike April 15. Union miners are not expected to accept the scale. W. G. Duncan, president of the Western Kentucky Coal Operators' Association says there is nothing to the rumor and added "the situation is delicate and any mention of the 1917 scale would make no end of trouble." Secretary George Baker refused to affirm or deny the report and Lonnie Jackson, president of District 23, United Mine Workers, said the Union officials had not been consulted on the move.



## State Insurance Will Continue Ten per Cent Below Company's Rates

The ten per cent differential of the State Workmen's Insurance Fund, which the insurance companies of Pennsylvania have been opposing since the fund was created in 1916, has been officially ratified by Governor Pinchot.

Samuel P. McColloch, State Insurance Commissioner, a year ago decided that the differential should be abolished, but he was overruled by Governor Pinchot and since then the companies have been endeavoring to get him to sustain the commissioner's views. The Governor said in a statement that the State fund is handicapped by being unable to pay commission to agents, that it must accept all risks and it can write only compensation insurance. The differential, he said, is an equalization which serves to balance in part certain disadvantages in cost of operation which weigh against the fund and not against the companies.

"At the time the State Workmen's Insurance Fund was established," the Governor said, "Many employees were not insured, thus leaving their workmen without sufficient protection. The fund was founded to make certain that every employer could, without fail, obtain insurance, and that his em-

ployees, in consequence, could be sure of the compensation to which they are entitled when accidents occur. When this administration took office there were still 50,000 employers in Pennsylvania who were not insured in either the State fund, in private companies or by self-insurance."

Most of the uninsured were small employers, many of them financially irresponsible, the Governor stated. Distress resulted because compensation due injured workmen or dependents could not be collected. There is little satisfaction, he said, to an injured workman to see his employer punished for not carrying insurance when he or his dependents are deprived of compensation properly due him under the law. In order to prevent such miscarriage of justice, eight states now provide compulsory workmen's insurance and require employers to take out insurance in the State insurance fund only. The Pennsylvania law provides for both State and private workmen's insurance.

"The State Fund is not an invasion by the State of the legitimate field of private business," said the Governor, "but a necessary welfare measure whose value to the working people of the State is beyond dispute." The statement declares that New York has a 15 per cent differential and Utah 20 per cent differential.

## Anthracite Plants Lay Off Awaiting Orders and Cars

Action by the Glen Alden Coal Co. in the week ending Aug. 9 in shutting down five of its collieries temporarily because of car shortages may prove to be the forerunner of a series of similar closings by anthracite operators throughout the northern anthracite region within the course of the next few weeks.

Though the shortage of cars was the immediate reason for the shut-down, the fundamental explanation lies in the slackness of the coal market at the present time. Thousands of cars of anthracite now ready for market remain on sidings and at docks throughout the country waiting for buyers, and while this condition continues there will be difficulty in obtaining "empties" for operation.

With most predictions for the future of the coal market anticipating a healthy revival in coal sales about the first of September, it is not expected

that the present situation will last long after the first of the month, and one local company, the Pennsylvania Coal Co., expressed the belief that it would be able to go through the period from now until Sept. 1 without any shut-downs. The Glen Alden Coal Co. announced its shut-down for a period "of two or three days only."

Reports from the lower anthracite region are to the effect that the Lehigh Valley Coal Co. is contemplating closing down several collieries, due to market conditions.

All the collieries of the Philadelphia & Reading Coal and Iron Co. in the Schuylkill and Northumberland regions were shut down the entire week. "The overstocked condition of the market," was given as the reason for the shut-down.

The chain of operations at Lattimer operated by Pardee Brothers and Co., Inc., suspended operations for the first half of the week. The reason for the suspension was explained by a statement from the company to the effect that repairs were being made.

## American Chemical Society To Discuss Coal Storage

Discussion of the nation's fuel supply will be a chief feature of the fall meeting of the American Chemical Society to be held at Cornell University, Sept. 8 to 13. Professor S. W. Parr, of the University of Illinois, will lead roundtable conferences on "The Storage of Coal and Spontaneous Combustion." Secretary Hoover's plans to relieve coal shortage and the report of the Coal Storage Committee of the American Engineering Council will be discussed.

The coal discussion will be held under the auspices of the Gas and Fuel Section, of which Dr. R. T. Haslam, of the Massachusetts Institute of Technology, is chairman. The Gas and Fuel Section will meet jointly with the Industrial and Engineering Division in a symposium on absorption. J. K. Davis, W. D. Langtry, N. R. Beagle, of Peoria, Ill., and W. H. Fulweiler, of Philadelphia, will participate in roundtable discussion on coal led by Professor Parr.

The tentative program also includes the following original papers: "Studies on Absorption of Naphthalene in Gas Oil," D. L. Kowalke; "The Rate of Flame Propagation and the Mass Law," F. W. Stevens; "Radiation from Non-Luminous Flames," W. G. Lovell, R. T. Haslam and R. D. Hunneman; "The Present Trend of the Manufactured Gas Industry," F. W. Steere; "Combustion Relations within the Fuel Bed of a Gas Producer," R. T. Haslam, F. T. Entwistle and W. E. Gladding; "Composition of the Volatile Matter Obtainable from Coke," H. J. Rose and G. G. Desy; "True Measurement of High Gas Temperature," R. T. Haslam, E. L. Chappell; "Studies on Spontaneous Combustion of Coal," J. D. Davis, John F. Byrne.

Foreign chemists will take part in the Ithaca meeting, among them Sir Robert Robertson, president of the Faraday Society; Sir Max Muspratt, one of the leading industrial chemists of Great Britain; and Prof. S. P. L. Sorensen of Copenhagen, a leader of the academic school, and internationally known for his work on the hydrogen ion.

## Kill Non-Union Miner With Bomb as He Enters Mine

A bomb was placed in a mine entry of the Hecla mine, of the St. Bernard division of the West Kentucky Coal Co., at Earlington, Ky., exploding when a switch was thrown to start current to a cutting machine, shortly before 8 a.m. Aug. 14, as a non-union crew was coming on the job. A colored mine worker was blown 30 ft. and instantly killed, and a driver was badly burned.

The explosion closely followed reports of Aug. 13 to the effect that mines in the section were to start non-union, Aug. 25. This is the first tragedy in the field since the strike was called on April 15. There are two airshafts close to the entry, and it is believed that the bomb was planted by entering through one of the airshafts. It is claimed that about 200 men are employed in the mine.



Clearfield Bituminous Coal Corporation's Tipple at Rossiter, Pa.

This structure, of concrete, steel and glass, is a good example of the practice, which has become general of recent years, of constructing all important mine buildings of permanent materials. Such buildings are so constructed today as to last throughout the estimated life of the mines they are intended to serve.



## Gates Explosion, Says Jury, Due to Accidental Ignition of Explosives

According to the report of the coroner's jury, the explosion at the Gates mine of the H. C. Frick Coke Co., July 25, which killed ten miners, was due to the accidental ignition of explosives used by the shotfirers, in No. 21 Room, Seventh Butt, North Section. The flame, says the jury, ignited coal dust suspended in the air.

The board of five mine inspectors, named by the state, was divided as to the origin of the blast. Two contended that a fall of rock set off the explosives which ignited the coal dust and the others believed the gas may have accumulated in the vicinity of Room 21 and been ignited by coal-cutting machines.

The inspectors' report closed with the following recommendations: 1—That the ventilation be arranged so as to reduce to a minimum, the chances of short circuiting the air current. 2—That proper examination be made and efficient supervision provided for the workings on the night shift. 3—That the Federal Bureau of Mines withhold its approval of electric detonators unless the type submitted for approval provides against their being exploded accidentally by electricity. 4—That greater care be exercised in the handling of detonators and explosives. 5—That all electric wires and equipment be installed and maintained and operated so as to reduce the danger of arcing to a minimum.

## Cumberland First-Aid Team Proves Best in Wyoming

A first-aid team from the Cumberland No. 2 mine of the Union Pacific Coal Co. won first prize at the Wyoming State First-Aid meet at Rock Springs, Wyo., Saturday, Aug. 9, with a score of 296 in a run-off with two other teams that had tied it at 293 for first place. Second place in the run-off went to the mine No. 4, Rock Springs team with a score of 294 and third to the team from Hanna, whose final score was 293. These three Union Pacific Coal Co. teams proved the best in the state. Fourth place went to a team from the Midwest Refining Co. from Casper, Wyo. It was this team's first venture in first-aid meets and W. D. Ryan, of the Bureau of Mines, who was master of ceremonies, complimented them highly. Also he said he had never seen better work in any first-aid meet in the country than was done by the various winners. The team that won first place was made up of these men: Capt. Lyman Fearn, T. H. Robinson, Jr., F. H. Buchanan, Charles Clark—substituting for Charles French who had been injured a few days before—and D. B. Ballantyne. The "patient" was Henry Goddard.

In the rescue contest which followed the first-aid meet, eight teams entered and No. 5 Mine of the Kemmerer Coal Co. which scored 175 won first place. Cumberland No. 1 and Hanna teams, both of the Union Pacific Coal Co., tied for second place with 165 and Cumberland won the cup on the toss of a coin.

## Ford Will Enter Retail Coal Business

W. B. Mayo, chief engineer, Ford Motor Co., when he arrived in Duluth on the Benson Ford, with 12,000 tons of bituminous coal aboard, the first Ford boat to enter the harbor, announced that coal sales offices would be opened by the company in Duluth and the Twin Cities. At first, probably, only carload shipments will be sold. The cargo of the Benson Ford will go to the Ford plants in St. Paul and Minneapolis, but when, later, all arrangements are made, Ford-mined coal may be carried over a Ford-railroad, the Detroit, Toledo and Ironton, be transported over the lakes in Ford boats, unloaded on a Ford dock (the Superior Coal & Dock Co.'s front just leased for one year by the Ford Motor Co.) and sold in Ford offices to the wholesale and retail trade, thus rescuing the Lake consumers from "the clutches of the coal profiteers." The D. T. & I., however, does not as yet tap Mr. Ford's eastern Kentucky fields.

## Three Mines to Be Shut Down Till Wage Contract Ends

B. M. Clark, president, Rochester & Pittsburgh Coal and Iron Co., has announced that Helvetia, Eleanor and Adrian will be closed down probably for two years, stating that with "an impossible wage scale" which makes the price of coal 50c. to \$1 less than the cost of production it is not feasible to operate these high-cost mines. Mr. Clark says: "We have reached the conclusion that the non-union fields can, and will, for several years to come, be able to furnish practically all the coal that the country demands and that the consumers will not pay us from 50c. to \$1 more per ton for coal than they can buy it for elsewhere. We expect to close not only the mines completely but the town also." The company has not yet decided whether to withdraw the pumps, but Mr. Clark stated that this probably will be done.

## Hudson's Bay Co. Entered Coal Business in 1852

An interesting part of the 1923 coal mining report of the Mines Department for British Columbia is the reproduction in facsimile of a letter dated Aug. 24, 1852, from James Douglas, then chief factor of the Hudson's Bay Co. in British Columbia, to Joseph McKay, a factor of the company, instructing him to proceed to Nanaimo (Nanaimo) Bay and to take possession "of the coal beds lately discovered there for and in behalf of the Hudson's Bay Co." and to levy a royalty on all coal mined there by anyone. This is the first authentic record of the commercial production of coal in this area.

The letter reads as follows:

"You will proceed with all possible diligence to Wentuhyusen Inlet, commonly known as Nanaimo Bay, and formally take possession of the coal beds lately discovered there for and in behalf of the Hudson's Bay Co.

"You will give due notice of that proceeding to the masters of all vessels arriving there and you will forbid all persons to work the coal either directly by means of their own labor or indirectly through indians or other parties employed for that purpose, except under the authority of a license from the Hudson's Bay Company.

"You will require from such persons as may be duly licensed to work coal by the Hudson's Bay Company security for the payment of a royalty of 2/6 a ton which you will levy on the spot upon all coal whether procured by mining or by purchase from the natives, the same to be held by you and from time to time to be duly accounted for.

"In the event of any breach or evasion of these regulations you will immediately take measures to communicate intelligence of the same to me."

## Italians Seek Coal Grant In Russian Field

An agreement soon to be concluded between Italy and Russia, according to the Mediterranean News Agency, will provide for the cession of a large section of the coal fields of the Donetz Basin to an Italo-Russian consortium for a number of years. By this agreement Italy hopes to be freed from dependence upon Great Britain, France and Belgium for her coal.

## First-Aid Team

Cumberland No. 2, Union Pacific Coal Co. won first prize at Wyoming State First-Aid Meet.





### Railroad to Nason Certified By Commerce Commission

The Interstate Commerce Commission has granted to the Jefferson Southwestern R.R. a certificate of public convenience and necessity to operate its line of railroad from Mount Vernon, Ill., to Nason, a new mining town, at which point is under development one of the largest coal mines in the world. It is owned by the Illinois Coal Corporation, with general offices in Chicago, of which Albert J. Nason is president.

The application for a certificate was granted by the Illinois Commerce Commission a year ago. It permitted this railroad to enter into intrastate business only. This case was hotly contested by some of the other carriers, but the Jefferson Southwestern R.R. finally won out through a Supreme Court decision, and although the interstate application was likewise opposed, the action of the Interstate Commerce Commission yesterday finally disposes of the matter.

### New Road Thoroughly Modern

This new railroad connects at Mount Vernon with the Chicago & Eastern Illinois, the Louisville & Nashville, the Southern, and W. C. & W. and it is proposed to continue the construction of this new road from the new town of Nason to a connection with the Chicago, Burlington & Quincy. At present the road is furnishing double daily passenger service in each direction between Mount Vernon and Nason by the use of a gasoline motor coach, which, in addition to the passengers it hauls, accommodates shipments of express and U. S. mail. The new road is modern in every respect; having been built of new 90-lb. steel and treated ties. It has no bridges, only two curves, and a maximum of 0.3 per cent grade. It is constructed to carry the heaviest locomotives.

The new town of Nason, which is approximately eleven miles southwest of the county seat of Jefferson County, Mount Vernon, has been laid out with considerable care by city planners and engineers who have provided ample space for parks, schools, churches, and other public buildings. Where a year

### Smokeless Coal Has Brisk Six Months of Operation

Total shipments of smokeless coal from southern West Virginia for the first six months of the current year aggregating 17,874,035 tons are 910,770 tons in excess of the first six months of 1923, according to a compilation made by the Winding Gulf Operators' Association.

ago was but a prairie is now a beautiful little city of over one thousand people, and it is expected that within the next three years this little town will have a population of over 5,000. The new mine is designed for a capacity of from twelve to fourteen thousand tons per day.

### Howat Runs for President of International Union

Alexander Howat, enfant terrible of District 14, United Mine Workers, is being dressed in his Sunday best for the international elections, the second Tuesday in December. Locals throughout the district already are sending in letters to the international board urging his nomination for international president.

Alex. isn't as popular with the neighbors as he is at home, however, and those who are pushing his campaign for the international presidency realize there is a good chance of his being declared ineligible by the board, before which he is on probation. Should the board take this action, time will remain to enter his name for the district presidency.

It was as president of District 14, a couple of years ago, that Howat, establishing a record for keeping his men on strike, got in bad not only with the Kansas state industrial court, but also with the international board. Only a few months ago the report came from Pittsburg, Kan., that he had gone back to work with pick and shovel in an effort to get reinstated in the union, and that one of the locals of the district had accepted his application for membership.

### Five Non-Union Miners Shot At Bull Hill, Oklahoma

War against the open shop mines of the Wilburton district in Oklahoma was renewed the night of Aug. 11, when five non-union miners, returning home from work in the Bull Hill mine, eighteen miles east of Wilburton, were shot from ambush and wounded severely. The attack took place on the eve of the preliminary hearing at Wilburton, of thirty-seven union miners accused of participating in the raid on the Kali-Inla mine near Cambria, Okla., last month. And it followed by only a few days the shooting from ambush of a non-union miner, fishing near the scene of the attack of Aug. 11.

The five men were the first of the day shift to quit the mine. They were followed closely by their comrades, who reached them, however, too late either to protect them or to catch their assailants. The Bull Hill mine employs fifty men. It is owned by J. B. Hilling, Ray Morgan and W. B. Merchant, of Red Oak, Okla. It has been operating as a non-union mine several weeks.

### Canada Delays Shock Attack On United States Coal

At a conference held at Edmonton, Alta., between Premier Greenfield, Hon. Charles Stewart, Dominion Minister of the Interior, and Sir Henry Thornton, President of the Canadian National Railways, it was decided that the projected experimental shipments of Alberta coal to Eastern Canada would not be undertaken this year, owing to lack of time to make the necessary arrangements.

The Premier pointed out that he had had no information from Ottawa as to any arrangement for putting into effect the contemplated plan of federal aid, and that until the Dominion authorities took action in that direction nothing could be done. Hon. Mr. Stewart said that assistance from the Dominion Government would be conditional upon the operators reducing their prices on the coal going East as they must be willing to co-operate with the Government by cutting prices at the mine if the Government is to help to pay the cost of transportation.

### Anthracite Produced—Breakers, Washeries and Dredges In 1923—By Regions

Region	Shipments		Local Sales		Used for Power		Total Production	
	Gross Tons	Value a	Gross Tons	Value	Gross Tons	Value	Gross Tons	Value a
<b>Lehigh:</b>								
Breaker product.....	9,538,147	\$62,782,100	558,796	\$2,135,158	1,008,884	\$1,752,849	11,105,827	\$66,670,107
Washery product.....	521,744	1,675,656	3,383	3,403	19,363	68,881	544,490	1,747,940
Dredge product.....	94,725	124,538	0	0	0	0	94,725	124,538
	10,154,616	64,582,294	562,179	2,138,561	1,028,247	1,821,730	11,745,042	68,542,585
<b>Schuylkill:</b>								
Breaker product.....	20,377,383	133,635,367	554,910	3,570,662	2,626,295	1,887,047	23,558,588	139,093,076
Washery product.....	1,552,511	6,185,369	186	1,110	59,537	47,550	1,612,234	6,234,029
Dredge product.....	284,682	306,184	462,231	369,520	6,370	5,107	753,283	680,811
	22,214,576	140,126,920	1,017,327	3,941,292	2,692,202	1,939,704	25,924,105	146,007,916
<b>Wyoming:</b>								
Breaker product.....	39,092,074	270,555,028	1,308,115	7,761,854	3,110,108	4,353,633	43,510,297	282,670,515
Washery product.....	1,680,032	7,215,898	4,852	14,611	174,518	352,536	1,859,402	7,583,045
Dredge product.....	5,592	5,476	0	0	300	240	5,892	5,716
	40,777,698	277,776,402	1,312,967	7,776,465	3,284,926	4,706,409	45,375,591	290,259,276
<b>Sullivan County:</b>								
Breaker product.....	280,822	1,912,541	7,841	51,450	5,000	13,000	293,663	1,976,991
Totals breaker product.....	69,288,426	468,885,036	2,429,662	13,519,124	6,750,287	8,006,529	78,468,375	490,410,689
Washery product.....	3,754,287	15,076,923	8,421	19,124	253,418	468,967	4,016,126	15,565,014
Dredge product.....	384,999	436,198	462,231	369,520	6,670	5,347	853,900	811,065
Grand total.....	73,427,712	\$484,398,157	2,900,314	\$13,907,768	7,010,375	\$8,480,843	83,338,401	\$506,786,768

a Value given is value at which coal left possession of producing company mines f.o.b. and does not include margin of separately incorporated selling companies



## "Niggerheads" in Utah Coal Are Dinosaurs' Tracks

An article appearing in the current issue of *Natural History*, written by Prof. William Peterson, director and geologist of the agricultural experiment station of the Utah Agricultural College, describes and accounts for the tracks of prehistoric dinosaurs in the roofs of Utah coal mines.

Professor Peterson says, in part:

"To view the tracks of ancient cretaceous monsters is not an entirely new experience, but to view these tracks from beneath instead of from above is somewhat of a novelty. This is a privilege open to those interested in the ancient life of the cretaceous seas of Utah and Colorado. It was the writer's good fortune to spend three summers in a detailed survey and inspection of the coal deposits of Utah. While he was examining the underground workings of many of the mines, attention was called to certain protuberances from the coal-seam roof. A definite shape had been recognized in the case of some of these, though most of them were spoken of as "carbuncles," "niggerheads," and under similar terms. In areas where the coal was low these protuberances had to be removed to give room for the mine hauling, for some of them projected as much as a foot below the roof of the coal seam. In some places the projections appear in groups while in others they are solitary.

"After inspecting hundreds of these protuberances, the writer agrees with some of the mine foremen and superintendents that these peculiar formations undoubtedly had their origin as tracks of ancient monsters which tramped through or around the border of the cretaceous seas. The tracks seem to have been made at a time when the peat accumulation was covered with a foot or more of mud. The layer of mud was not sufficiently thick to support the weight of the animal walking over it. The feet sank through the mud several inches or even more than a foot at times, into the soft yielding peat underneath. Some mud was pushed into the peat as the animal brought down its weight, and as it drew out its foot the footprint would be filled with mud from above.

### Peat Changed to Coal

"As time went on, nature's distillation reduced the peat to coal, and the mud with its track projections was converted into solid rock. In most places the coal is easily separated from the roof, leaving the track-shaped protuberance extending partly or wholly as a definite appendage from the ceiling. When the coal is completely removed, the tracks appear in various forms. In some cases the footprints project only part way through the roof and in others they project so far that a clear space is shown between the portion of the track represented by the toes and the solid roof. It is interesting to note that, as far as observed, the largest tracks are the ones which protrude farthest from the rock roof. The material filling the track varies slightly, but is for the most part an arenaceous shale or argillaceous sandstone.

"The animals seem to have walked for the most part along trails or definite paths. It was noted that some of these paths are 20 or 30 ft. in width, and the exposures in many entries and rooms of the coal mines show them to be comparatively straight in alignment. The individual tracks in the paths are seldom clearly outlined, and only when one of the animals has traveled independently does every imprint become distinct. In several places it has happened that an entry of the coal mine has followed approximately the path of a single animal, thus exposing several of the tracks for measurement and comparison. Seven consecutive tracks are shown in the old Ballard mine on the property of the American Fuel Co., located on the Denver & Rio Grande R.R. about eight miles north of Thompson Springs. These tracks are among the largest observed.

"In a different entry of the mine, tracks of similar size are found, and by courtesy of the company one of these was taken down and shipped to the geological museum of the Utah Agricultural College at Logan. The track measures 31 in. between the spread of the outer toes and 32 in. from the heel to the front of the middle toe. Near the point of separation the toes are from 6 to 8 in. in diameter, and the toes are so pointed as to indicate the presence of rather sharp claws on the end of each toe."

## Kentucky Insurance Company Fails to Pay Compensation

C. C. Ousley, secretary of the Associated Industries of Kentucky, in a bulletin issued today, makes a strong appeal for safe insurance, in a comment under the heading: "Employer Left to Hold the Bag." He said:

More than one employer probably experienced an unpleasant sensation on reading a recent newspaper dispatch telling how a judge of the Court of Appeals has refused to restrain the sheriff of an eastern Kentucky county from executing judgment against a coal company on an award of the Kentucky Workmen's Compensation Board in favor of an injured employee. The facts as stated in the press, were that the company had insured its liability with a carrier which was doing business in the State in the spring of 1922, when the accident occurred, and which, it is claimed, at the time stood approved by the Workmen's Compensation Board. The carriers' license was not renewed the following July, and about a year later the insurance company went out of business. He adds:

"If the facts are as reported in the press, improved administration is one of the things which would bring greater comfort to the mind of the insuring employer. Not only close supervision of carriers while they are in this field is desirable, but assurance that on retirement they are leaving behind deposits adequately protecting their former clients. This is essential to assure the employer a good night's rest where he has workers with allowed claims. Care in the selection of a carrier is of course something the employer himself can exercise with profit."

## Gutheim Opposes a Rehearing Of Northwest Freight Case

Reply to the reasons advanced for a rehearing in the case of the Northwestern Coal Dock Operators' Association versus the Chicago & Alton Railroad Co. has been made by August G. Gutheim on behalf of the C. Reiss Coal Co. and the Milwaukee Western Fuel Co. In opposing the rehearing, Mr. Gutheim points out that the Interstate Commerce Commission and other government organizations in forcing, protecting and pooling the movement of coal to these docks indicates that the docks constitute a necessity for the fueling of the Northwest. "This admitted," he says, "it hardly could be argued seriously that they were entitled to do business only at such times as other producers could not take care of all northwestern needs. If that be the rule, then the docks, with their enormous investment in facilities and in coal, are ruined."

He cites figures to show that "the tonnage from southern Illinois has increased in greater proportion than that from the docks." He refers to the inference on the part of southern Illinois carriers to the effect that southern Illinois rates were exceptionally low. Mr. Gutheim further contends that the commission is amply empowered to make the orders which have been attacked by the Illinois Coal Traffic Bureau and the Wisconsin Traffic Association. At another point in his brief, Mr. Gutheim makes this important statement:

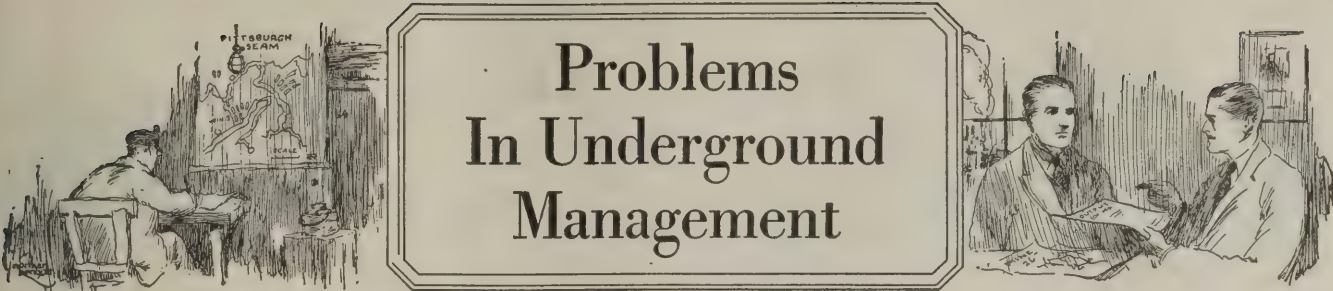
### Shippers Entitled to Protection

"All these petitioners seem to overlook the fact that not only the consumers, but the shippers, whether docks or mines and the carriers are entitled to the protection of the law. The complainants for whom this answer is filed, did not begin this litigation. Certainly they never started out with the sole purpose in mind of making consumers pay more for coal. But as has already been noted, they were compelled, as a matter of defense to the complaint originally filed by the Illinois interests, to file a complaint bringing in issue the rates from southern Illinois—the real shipping rates, which were carefully left out of the picture by the Illinois complainants. It is only as a result of this that there have finally come the orders of the commission under attack.

### Say Rates Should Not Be Changed

"The docks were compelled as a matter of defense to raise before the commission the lawfulness of the adjustment between themselves and southern Illinois in reaching Wisconsin destinations. The petitioners stress the fact that this is no time to increase rates. The fact remains that the docks in adopting their plan of defense against the attack of Illinois were under the necessity of recognizing that this commission might consider the present no time to reduce any of the rates here involved. The question being originally raised by Illinois, and the unlawful preference and prejudice being found to exist, the commission has done the only thing permitted by the law in ordering its removal."





# Roof, Ribs and Floor Wetted by This Sprinkler Car

By FRED SCAMMEL  
War, W. Va.

**E**XPLOSIONS resulting from accumulations of coal dust within the mines, have caused many mining companies to seek means for allaying such dust. The Warriar Coal Co., at War, W. Va., has given serious consideration to this problem, with the result that the sprinkler car shown in the accompanying illustration has been developed and put into use.

In operation this car is pushed along the track ahead of a locomotive. Inasmuch as the water is projected forward in a cone-shaped spray the men operating the machine are always kept dry, even though all surfaces of the rooms, headings and other passages where this machine is used are thoroughly and impartially wetted down.

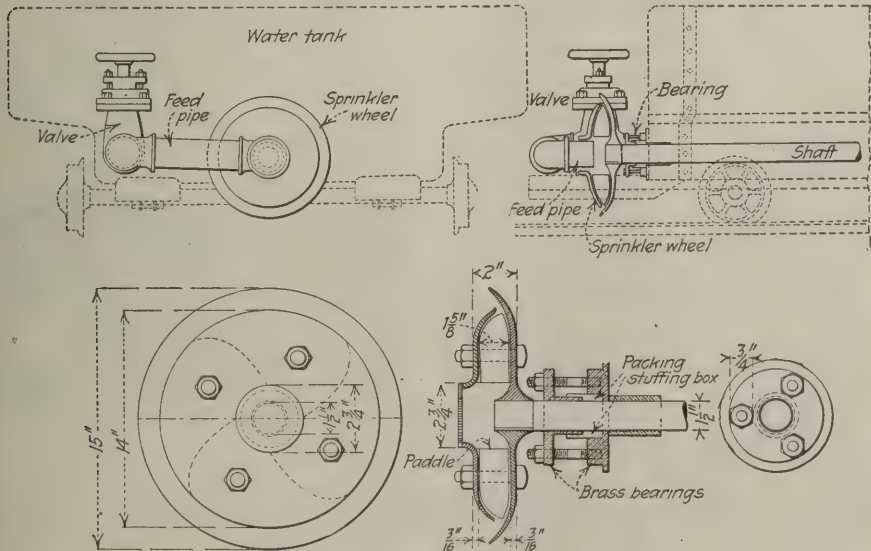
This machine sprinkles floor, roof and ribs alike, only two men being required for its operation, and the entire mine may be treated by it in from 4 to 5 hr. Thus far highly satisfactory results have been secured by its use. Its operation has been endorsed by the district mine inspector.

This sprinkler consists of a tank of 1,000 gal. capacity mounted on a mine-car truck. On the rear end of this truck is placed a 3-hp. motor which is

back-gearred to a shaft extending through the tank. On the forward end of this shaft, which is fitted with stuffing boxes where it passes through the tank walls, a sprinkler wheel is mounted. This is fed with water from the tank through a 2-in. pipe.

Probably the most unusual feature of this machine is the sprinkler wheel. This somewhat resembles the impeller of a centrifugal pump, consisting essentially of two disks, cupped in opposite directions, with vanes between them. The rear disk overlaps the forward one so that the water issuing from between them is directed forward by it. Water is thus projected from the wheel in a cone-shaped spray.

Ribs, roof and roadway are thus sprinkled, the machine throwing water onto the entire perimeter of the passage within which it operates. Furthermore the sprinkler will thoroughly wet down the face of a room even though the track may not extend entirely to the face. The bug dust and other fine coal in the room is thus wetted down and may be loaded out without the danger of its flying about which is always present when such material is loaded dry.



Sprinkler Car and Some of Its Details

The sprinkler head or wheel, which is operated by a motor on the rear of the car, both in appearance and effect somewhat resembles the impeller of a centrifugal pump. Inasmuch as the rear disk is cupped forward and overlaps the front disk, water is thrown ahead of the car in a cone-shaped spray, thoroughly wetting all surfaces of the mine passage while the men operating the car are kept dry.

## An Uncleaned Shothole May Cause a Misfire

By GEORGE EVANS  
Technical Representative E. I. du Pont  
de Nemours

Coal dust in boreholes affects the proper detonation of ammonia permissible dynamites. Where jackhammers are used, a  $\frac{3}{4}$  to 1-in. gas pipe is connected to the air line and then pushed into the borehole two or three times, so as to blow out the dust. This procedure will not clean the holes completely especially if they are from 6 to 9 ft. long. Enough dust remains so that when the dynamite cartridges are loaded a certain quantity of it will lodge between the cartridges. The results of allowing coal dust to interpose itself between cartridges of ammonia permissibles can be seen readily from the following tests, which were made by placing a certain quantity of coal dust between two 1 $\frac{1}{2}$ x8-in. cartridges of permissible powder. No tamping was used and the charges were unconfined.

### Tests of Detonation of One Cartridge by Another with Explosive Unconfined

Thickness of Coal Dust Between Cartridges, Inches	Number of Tests Made	Failures to Detonate Second Cartridge
$\frac{1}{8}$	5	0
$\frac{1}{4}$	5	0
$\frac{1}{2}$	5	5

It will be noted that 1 in. of coal dust sufficed to prevent the detonation of one cartridge by another.

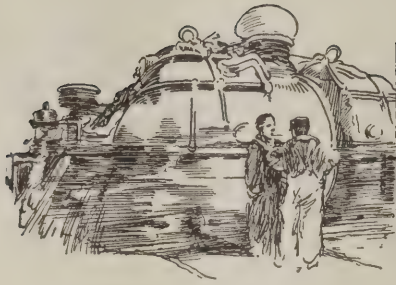
Additional tests were made to determine what results would be obtained if certain quantities of coal dust were placed between two 1 $\frac{1}{2}$ x8-in. cartridges of permissible explosives loaded in a borehole, but in this case with the charges well confined by tamping. Much better results were obtained as indicated below:

### Test of Detonation of One Cartridge by Another with Explosive Confined

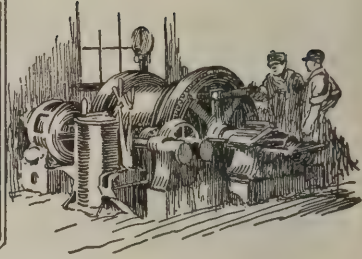
Thickness of Coal Dust Between Cartridges, Inches	Number of Tests Made	Detonations of Second Cartridge	Failures of Second Cartridge
2	5	5	0
3	2	1	1
4	2	1	1
5	2	1	1
6	2	1	1

It will be noted that the confined charge did not fail until 2 in. more of coal dust had been introduced than was the case with unconfined charges. This again proves that tamping boreholes full to the collar is necessary to obtain satisfactory results from these ammonia permissibles.





## Practical Pointers For Electrical And Mechanical Men



### How Repair Costs Have Been Reduced By a Large Coal Company

By Knowing How Electrical Apparatus Is Constructed Better Care Is Taken—Meters and Instruments Are Periodically Tested and Checked

AT THE main office of the Pennsylvania Coal & Coke Co., Cresson, Pa., every possible means has been provided to familiarize the workmen with electricity. The rapid expansion of the various uses of electrical energy has made it almost impossible for even those directly working with it to study its many applications.

Workmen at the mines use electrical equipment as tools to assist them in their labors. To them electricity is usually an unknown science. Nevertheless, these men must learn to operate the new machinery and so must learn something about the mysterious power by which it is driven.

Hazards and accidents are always frequent when a man does not understand his work or the equipment he uses. A repair man who must keep the electrical apparatus in good condition can do his work much better if his knowledge of electricity is not limited to a few elementary ideas of the subject.

To tell a workman or mine foreman that he must not overload his machines does not carry any convincing evidence of the damage that

trate the ratios of three-phase and single-phase voltages and currents.

From the test board shown in Fig. 1, single-, two-, three- or six-phase alternating-current voltages are obtainable. This panel is located at A in the large picture and is protected against short-circuits, overloads, and other dangers. The other illustra-

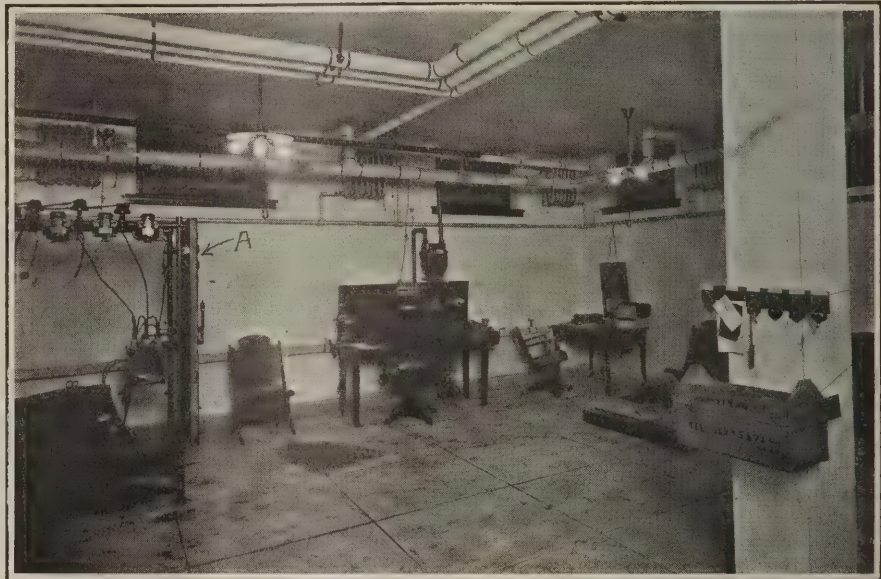


Fig. 2. Classroom and Laboratory Combined at Pennsylvania Coal & Coke Co.'s Cresson Office

This is where the workmen gather to study the machines they work with. At the board A both alternating and direct current are available for tests. Demonstrations are carried on here to show how different machines and parts function.

may result. Oftentimes the men do not know when they are endangering themselves or others or damaging apparatus. It was with these points in mind that J. F. MacWilliams, the electrical engineer of the company, started, in the room shown in the large illustration, a school of instruction for his men and other workmen at the mines who are responsible for the use of electrical equipment.

This room is equipped with an alternating-current circuit from which, by the use of transformers and a motor-generator set, it is possible to obtain any desired alternating- or direct-current voltage.

Every Thursday evening is held a class in practical electricity. Machinery commonly used around the mines is studied, taken apart and tested. The important features of the apparatus are described and its function and limitations are considered.

Recently the class finished the construction of a rotary converter made from a 15-hp. crane motor. This machine was built and tested to illus-

tion, Fig. 3, shows some of the testing meters used in the school. In the center of the group is a new bond testing instrument developed by Mr. MacWilliams. Aside from being used

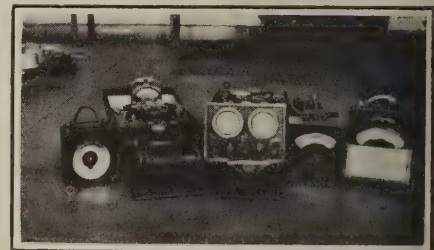


Fig. 3. Group of Testing Instruments

These meters make it possible to test almost any piece of electrical equipment while in operation. These instruments are also part of the metering apparatus used by the company.

as a classroom, periodic tests and inspection of electric meters, instruments, etc., are made here. In a separate room nearby, spare repair parts and emergency equipment are kept.

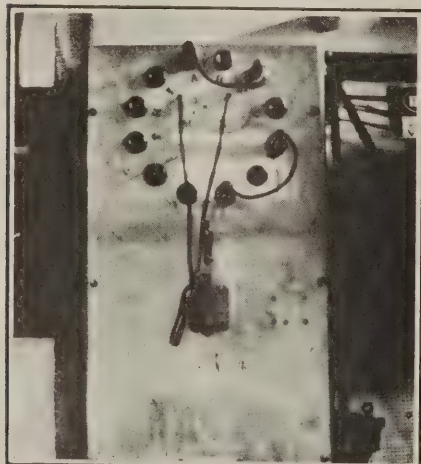


Fig. 1. Alternating-Current Test Board

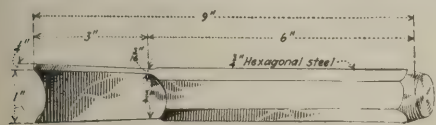
By changing the connections on this board many different voltages are obtainable for testing purposes. Single-, two-, three- and six-phase circuits can be taken from the panel.



By using the room for these different purposes the cost of the equipment is not directly charged against the school; in fact, the use of the room by the class is after working hours. Many novel and interesting devices have been worked out in this little laboratory, and the reduced maintenance costs at the mines have amply repaid the management for the investment necessary for training the men in the care of electrical machinery.

### Slitting Chisel You Can Make for Yourself

The mechanical man at the coal mines often has need for special tools that cannot be purchased at any store or supply house and which, consequently, must be made on the job. One such implement known as a slitting chisel is shown in the accompanying sketch. Although this is an extremely



Tube-Slitting Chisel

useful instrument for slitting tubes, shearing plates and the like, and although there is nothing particularly new about it, yet it can seldom, if ever, be found for sale in the ordinary hardware or tool store.

For tube cutting, as in removing a tube from a boiler, the blade should be slightly longer than the diameter of the tube. As may be seen this blade is relieved throughout its length to prevent its binding in the incision made. The edge or point is square, that is, the cutting done is a shearing action on the square corner of the blade point. In cutting off a tube one corner of the point is first driven through the tube wall and then a strip cut out entirely around the tube.



Projector Lamps Light This Mine Yard

These units are placed so as to reflect the light over wide areas thus providing good lighting for all important sections. On dark winter days the output of these mines will not be lowered due to lack of light.

### Floodlighting the Mine Yard

Oftentimes it is difficult to light certain regions around the mine yard. Ordinary lamps with flat reflectors cannot be located where the light is most needed. Poles or posts promiscuously placed are often in the way when changes are being made. Breakage, theft and loss is most frequent when lamps may be easily reached. Perhaps most serious of all is the dust and dirt which usually sticks to the open lamp and reflector and seriously cuts down the light.

At the No. 15 Mine of the Consolidated Coal Co., near Staunton, Ill., most of the outside mine lighting is done by floodlight lamps installed on permanent structures in the yard. These lights project a wide cone of light which illuminates a large area. Because the lamps and reflectors are enclosed the quantity of light furnished does not

vary. What little dirt gets on the glass cover of the unit is easily washed off by the rain or removed by occasional cleaning by one of the workmen.

### One Way to Keep the Yard Safe and Clean

It is rather unusual to visit a mine and not find it necessary to walk through carbide dust. At Thermal

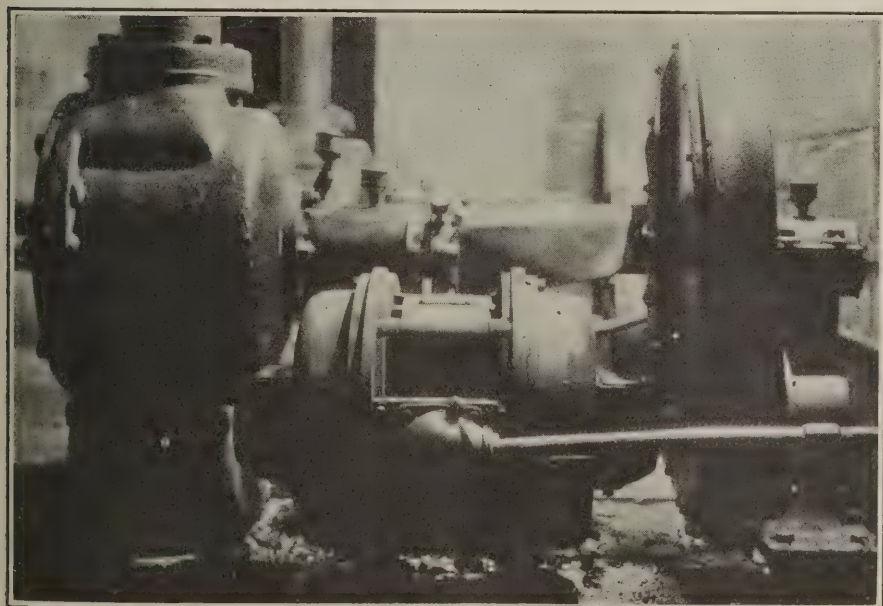


Where Carbide Lamps are Emptied

By providing receptacles like these the fumes of carbide are not spread all around the mine yard.

Mine No. 4 of the Donk Bros. Coal and Coke Co., near Edwardsville, Ill., artistically designed boxes set up on small poles are located where the miner can empty his carbide lamp when he leaves the mine.

Careless throwing of carbide around the mine yard often causes accidents to say nothing of the obnoxious smell that arises from the dust whenever it rains or snows.



Pumping Unit Works Whenever Water Enters the Sump

This unit consists of a motor and a pump, the latter having geared parts which, without priming trap the water or air inside the pump casing and discharge it. The pump operates continuously and keeps its sump nearly empty at all times. Owing to the simplicity of its construction the pump requires little attention.



## Discussion

### Three Suggestions to Methods of Mining a Difficult Coal Seam

#### Best Plan Probably Is to Use a High-Cutting Machine to Cut Out the Rash Above the Bottom Seam

In the problem which a West Virginia operator propounds on page 22 of this volume I assume that the 10 in. of drawslate is loose enough that it will fall when the coal is shot down and that the roof above the drawslate is a good hard stratum that can be held in place. The seam could be worked by what is known as the double-entry or double-stall system. In this system the room is driven usually 40 ft. wide where there is a good top and bottom. This makes it possible to use two tracks for loading out the coal, and to build all refuse into walls or to stow it in the gob between the tracks. The tracks on each side of the room should be kept 4 ft. clear of the room ribs. This allows posts to be set along the side between the track and the rib side of the coal. A row of posts is set also along the other side of each track. The posts usually set in the gob should also be used in this instance. The drawslate could be used to form a building along the gob side of the track.

Two methods of extraction could be used successfully. The coal-cutting machine could be set on the top of the bottom or 11-in. seam of coal, allowing the machine to make its cut in the 5½ in. of mixed slate and coal. Then, perhaps, the 4½-in. seam of coal and the 4½ in. slate parting might fall as the machine is undercutting it. If not it could be taken down by an experienced man. He

might have to put in a few light shots to dislodge it, but that operation would not be laborious enough to prevent the work being done at a reasonable figure.

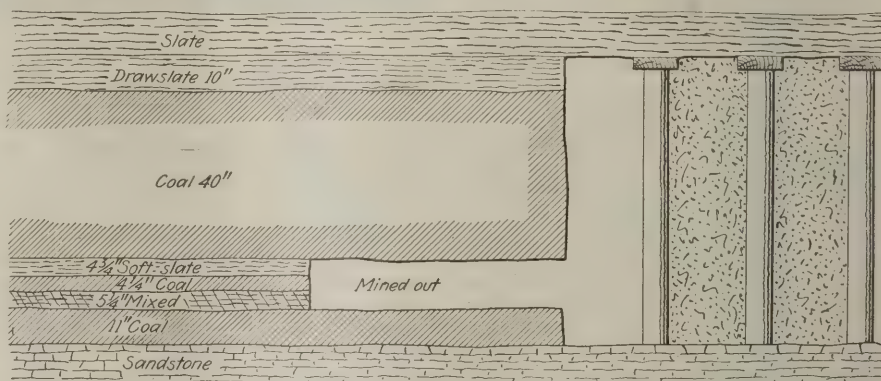


Fig. 2—Rubbish in Seam Is Partly Cut Out and Partly Removed by Powder or Bar. Upper and Lower Benches Are Then Loaded

Of course more room must be left than is shown between gob and coal face and where an ordinary low-cutting mining machine is used, the lower bench must be left 6 ft. behind the face of the upper bench.

The cuts thus enlarged could be shoveled out into the gob and stowed there, thereby leaving the top coal whole. This would uncover the bottom coal so that it could be removed later and at the same time it would free the main seam.

However, the machine cut might be

difficult to lift. This would expose the 11-in. seam which could be mined somewhat later. I am assuming, of course, that the 11-in. seam is good coal.

In my opinion the latter scheme is the better, even if it should cost a few cents more to lift the 4½ in. of coal and the 5½ in. of rash. If a 6-ft. cut was made by the cutting machine it should not be difficult to remove the underlying 9½ in. Of course, if this method were adopted, the miners would have to take due precautions while removing the refuse. The coal would have to be supported by sprags as shown in the illustration.

As the top coal is hard, a good shot in each corner and a number of light shots across the face would bring down the face if the sprags were redrawn. Another suggestion is to get a machine that would stand on the hard sandstone bottom and cut in either the soft slate or the rash as has been outlined. I understand that there are a number of machines in the market that will cut at a level 12-in. or more above the floor. By using such a machine the bottom coal could be kept up with the main seam and a good bottom on which the machine would travel freely would be available. This would be better for timbering and loading. In the first two plants the bottom coal would have to be left at least 6 ft. back of the main coal face in order to give the machine a berm on which to travel. The last suggestion would appear to be the best.

Newcastle, Wash.

JAMES GRAY.

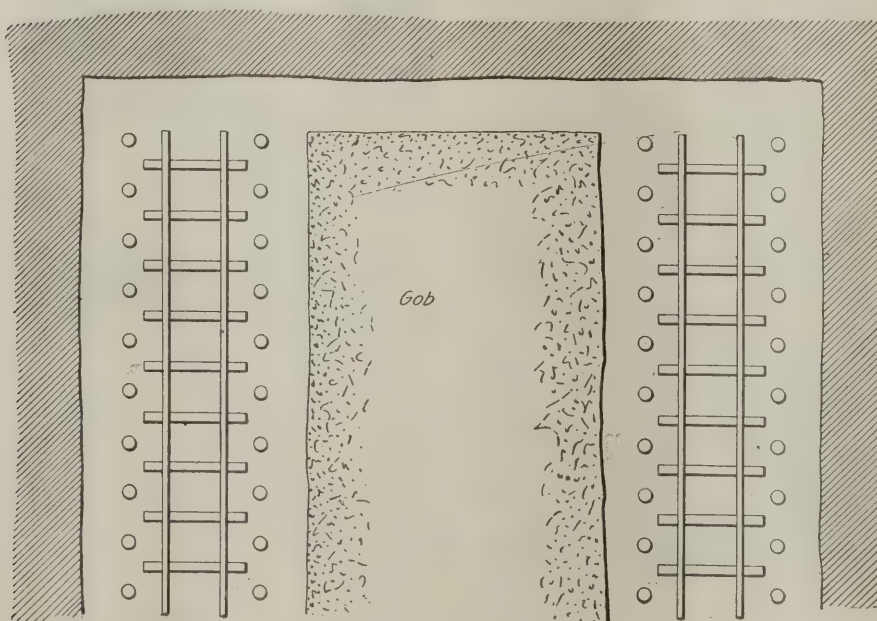
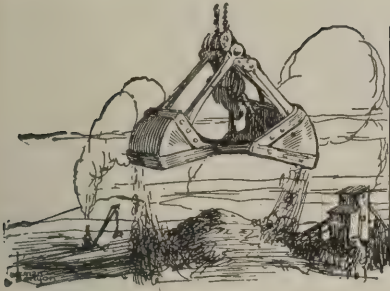


Fig. 1—Double Entry Room with Two Tracks and Gob Between

Posts are put on either side of track to give firm support to roof. Drawslate, soft slate, rash and thin bed of coal will more than fill gob.





# Production And the Market



## Lack of Funds of Manufacturers and Householders Restricts Sales, but Soft-Coal Prices Improve

In the Middle West the bituminous-coal industry seems to be experiencing a slight improvement, but in the East, especially in New England, the report is quite discouraging. The public appears to be delaying buying not only from a sense that coal will be available when demanded but because business has been so poor that money is not obtainable for the making of purchases, even where the consumer has a conviction that there will be a scarcity this winter and that it would be well for him to get under cover. The cry seems general that purchasers are slow to pay. But in the Northwest, where the farmer is looking for and actually experiencing prosperity and the ore mines are preparing for resumption, the coal is not being taken from the docks so that more can be brought in. There is need for greater circumspection in that region, for the indications are that the wherewithal to purchase coal is not lacking.

### Spot-Price Index Advances

Coal Age Index of spot prices of bituminous coal shows an increase during the past week, standing on Aug. 18 at 165, the corresponding price being \$2.00, as against 163 and \$1.98 the previous week.

Hampton Roads dumpings for all accounts during the week ended Aug. 13 totaled 395,568 net tons, an increase of 36,652 tons from the week preceding.

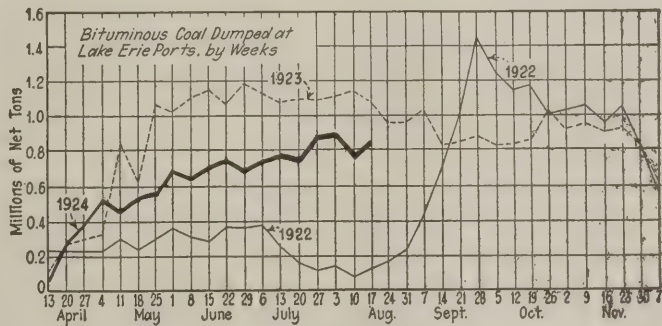
A sharp upturn marked the movement of coal at the lakes, dumpings during the week ended Aug. 17, according to the Ore & Coal Exchange, being as follows: For cargo, 765,872 net tons; for fuel, 42,785 net tons, compared with 725,168 and 47,054 net tons respectively during the preceding week.

The production of bituminous coal for the week ending Aug. 9 increased slightly, the output according to

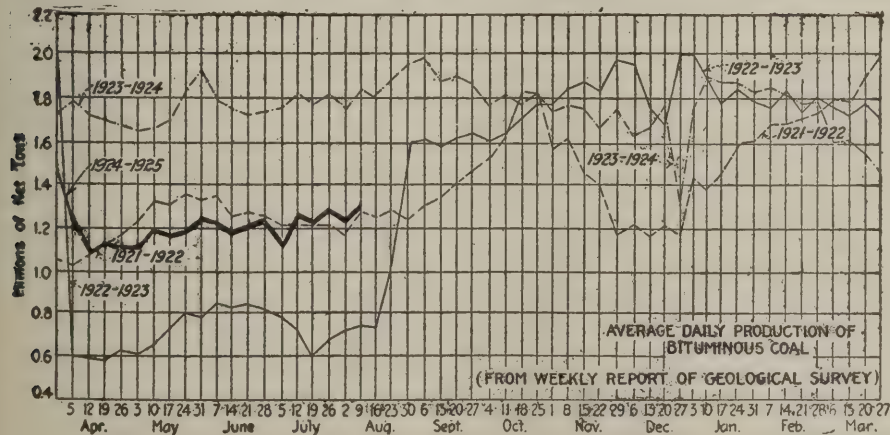
the Geological Survey, totaling 7,800,000 net tons. The previous week showed an output of 7,484,000 tons according to revised figures. Anthracite production decreased, being 1,683,000 net tons in the week ending Aug. 9 and 1,720,000 tons in the previous week.

### Hard-Coal Market Depressed

Anthracite is even more loggy than bituminous coal though stove size seems to be in great demand. However, if there were a big supply that demand would soon evaporate. Unless the anthracite companies have a similar demand for other sizes they are unable to comply with the insistent demand for stove, which in economical operation can represent only a certain por-



tion of the whole production. The purchase of anthracite seems to be delayed by the lower earning ability of the consumer. He finds all his dollars expended for immediate needs and does not look to the future. If he does not buy soon, however, the retailers will be doling out anthracite in single-ton lots and the snowbirds with their poor coal will come back, eventualities good neither for public, operator nor retailer.



### Estimates of Production

	(Net Tons)	
<b>BITUMINOUS</b>		
	1923	1924
July 26 .....	10,817,000	7,543,000
August 2 (a) .....	10,564,000	7,484,000
August 9 (b) .....	9,851,000	7,800,000
Daily average .....	1,866,000	1,300,000
Cal. yr. to date (c) .....	332,386,000	269,684,000
Daily av. to date .....	1,775,000	1,435,000
<b>ANTHRACITE</b>		
July 26 .....	2,080,000	1,837,000
Aug. 2 .....	2,018,000	1,720,000
Aug. 9 .....	1,735,000	1,683,000
Cal. yr. to date (c) .....	62,569,000	55,372,900
<b>COKE</b>		
Aug. 2 (a) .....	345,000	95,000
Aug. 9 (b) .....	326,000	89,000
Cal. yr. to date (c) .....	12,139,000	6,669,000

(a) Revised since last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.



## No Change in Midwest Market

Domestic buying continues slow in the Midwest, although there is some improvement in southern Illinois high grade. The cheaper coals seem to be at a standstill. Anthracite and smokeless are slow, but coke shows a little activity. Wagonload steam is not a factor, and carload and country steam are sluggish. Domestic business for certain grades of coal in the country shows up well in spots. This forecasts good conditions a little later.

In the Carterville, Duquoin, Mount Olive and Standard fields the situation is unchanged. In the Carterville and Duquoin fields the mines are working one or two days a week with a mine here and there doing better. In these latter fields and in the Standard all sizes remain unbilled on track. The Mt. Olive moves a little railroad tonnage, but little domestic coal is sold, and the steam tonnage just about keeps up with contract requirements. In the Standard field some mines are closing and some starting. Lump movement to the Northwestern territory has improved a little and screenings have been in demand for a day or two. Strip mines are making headway. Tonnages are increasing and the mines run steadily with prices 25c.@50c. below

those of shaft mines. They are loading some railroad coal.

A much better tone prevailed in the Chicago coal market this week. Orders were booked in satisfactory volume and many promising inquiries were received. For the first time in weeks the holding tracks in the Chicago switching districts were free from distress coal and for the first time this year substantial contracts were closed. High-grade domestic lump, egg and nut, especially the first two mentioned, are moving in some volume to the Northwest. The country retailers in Illinois and Indiana are still holding back. West Virginia and Kentucky splints are being shipped in large quantities and the quantity will increase if the proposed through rates go into effect this fall.

There is no change in the St. Louis situation, although a little domestic business has begun to move through the dealers, mostly for middle-grade coals. Anthracite, smokeless and coke are moving slow and for standard there is no demand at all. A little wagonload steam is moving and orders for carload steam are hard to find. Country domestic is picking up and this improvement is quite noticeable. Country steam, however, is slow and there is nothing of any consequence moving out to Chicago or the Northwestern steam markets.

## Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern		Market Quoted	Aug. 20 1923	Aug. 4 1924	Aug. 11 1924	Aug. 18 1924†
Smokeless lump.....	Columbus.....	\$5.85	\$3.60	\$3.60	\$3.50@	\$3.75
Smokeless mine run.....	Columbus.....	3.00	2.10	2.10	1.85@	2.15
Smokeless screenings.....	Columbus.....	2.35	1.20	1.20	1.15@	1.30
Smokeless lump.....	Chicago.....	5.75	3.85	3.85	3.75@	4.00
Smokeless mine run.....	Chicago.....	3.00	1.85	1.85	1.75@	2.00
Smokeless lump.....	Cincinnati.....	6.10	3.75	3.85	3.75@	4.00
Smokeless mine run.....	Cincinnati.....	3.00	1.85	1.85	1.75@	2.00
Smokeless screenings.....	Cincinnati.....	2.75	1.30	1.30	1.25@	1.50
*Smokeless mine run.....	Boston.....	5.30	4.30	4.20	4.10@	4.20
Clearfield mine run.....	Boston.....	2.35	1.90	1.90	1.35@	2.35
Cambria mine run.....	Boston.....	2.85	2.30	2.25	2.00@	2.90
Somerset mine run.....	Boston.....	2.60	2.05	2.05	1.75@	2.50
Pool 1 (Navy Standard).....	New York.....	3.05	2.70	2.30	2.25@	2.35
Pool 1 (Navy Standard).....	Philadelphia.....	3.40	2.80	2.80	2.60@	3.00
Pool 1 (Navy Standard).....	Baltimore.....	2.55	2.05	2.05	1.90@	2.25
Pool 9 (Super. Low Vol.).....	New York.....	2.75	2.15	2.15	1.95@	2.35
Pool 9 (Super. Low Vol.).....	Philadelphia.....	2.50	1.95	1.95	1.90@	2.00
Pool 9 (Super. Low Vol.).....	Baltimore.....	2.20	1.80	1.95	1.70@	2.00
Pool 10 (H.Gr. Low Vol.).....	Philadelphia.....	2.30	1.75	1.75	1.65@	1.90
Pool 10 (H.Gr. Low Vol.).....	Baltimore.....	2.25	1.70	1.70	1.65@	1.75
Pool 11 (Low Vol.).....	New York.....	1.85	1.50	1.60	1.50@	1.75
Pool 11 (Low Vol.).....	Philadelphia.....	1.85	1.45	1.45	1.35@	1.60
Pool 11 (Low Vol.).....	Baltimore.....	1.90	1.55	1.55	1.50@	1.50
High-Volatile, Eastern						
Pool 54-64 (Gas and St.).....	New York.....	1.75	1.50	1.50	1.35@	1.65
Pool 54-64 (Gas and St.).....	Philadelphia.....	1.75	1.50	1.50	1.40@	1.60
Pool 54-64 (Gas and St.).....	Baltimore.....	1.85	1.45	1.45	1.40@	1.50
Pittsburgh so'd gas.....	Pittsburgh.....	2.80	2.40	2.40	2.30@	2.50
Pittsburgh gas mine run.....	Pittsburgh.....		2.10	2.10	2.00@	2.25
Pittsburgh mine run (St.).....	Pittsburgh.....	2.05	1.85	1.85	1.75@	2.00
Pittsburgh slack (Gas).....	Pittsburgh.....	1.55	1.30	1.30	1.25@	1.40
Kanawha lump.....	Columbus.....	3.00	2.10	2.10	2.00@	2.25
Kanawha mine run.....	Columbus.....	1.85	1.45	1.40	1.30@	1.55
Kanawha screenings.....	Columbus.....	1.05	1.05	1.05	1.00@	1.15
W. Va. lump.....	Cincinnati.....	3.25	2.25	2.25	2.00@	2.50
W. Va. gas mine run.....	Cincinnati.....	1.70	1.35	1.45	1.45@	1.65
W. Va. steam mine run.....	Cincinnati.....	1.70	1.35	1.45	1.35@	1.50
W. Va. screenings.....	Cincinnati.....	1.05	.90	.85	.85@	1.00
Hooking lump.....	Columbus.....	2.75	2.45	2.45	2.25@	2.65
Hooking mine run.....	Columbus.....	1.85	1.55	1.55	1.45@	1.65
Hooking screenings.....	Columbus.....	1.10	1.05	1.05	1.00@	1.15
Pitts. No. 8 lump.....	Cleveland.....	2.60	2.40	2.40	2.00@	2.85
Pitts. No. 8 mine run.....	Cleveland.....	2.05	1.85	1.85	1.85@	1.90
Pitts. No. 8 screenings.....	Cleveland.....	1.20	1.10	1.20	1.20@	1.40
Midwest		Market Quoted	Aug. 20 1923	Aug. 4 1924	Aug. 11 1924	Aug. 18 1924†
Franklin, Ill. lump.....	Chicago.....	\$3.90	\$2.85	\$2.85	\$2.75@	\$3.00
Franklin, Ill. mine run.....	Chicago.....	2.85	2.35	2.35	2.25@	2.50
Franklin, Ill. screenings.....	Chicago.....	1.65	1.70	1.70	1.60@	2.10
Central, Ill. lump.....	Chicago.....	2.60	2.50	2.50	2.50@	2.75
Central, Ill. mine run.....	Chicago.....	2.10	2.10	2.10	2.00@	2.25
Central, Ill. screenings.....	Chicago.....	1.35	1.60	1.60	1.50@	1.75
Ind. 4th Vein lump.....	Chicago.....	3.35	2.60	2.60	2.50@	3.00
Ind. 4th Vein mine run.....	Chicago.....	2.60	2.35	2.35	2.25@	2.50
Ind. 4th Vein screenings.....	Chicago.....	1.55	1.70	1.70	1.75@	1.85
Ind. 5th Vein lump.....	Chicago.....	2.75	2.35	2.35	2.25@	2.75
Ind. 5th Vein mine run.....	Chicago.....	2.10	2.10	2.10	2.00@	2.25
Ind. 5th Vein screenings.....	Chicago.....	1.40	1.55	1.55	1.30@	1.65
Mt. Olive lump.....	St. Louis.....	3.00	2.85	2.85	2.75@	3.00
Mt. Olive mine run.....	St. Louis.....	2.00	2.50	2.50	2.50	
Mt. Olive screenings.....	St. Louis.....	1.50	2.00	2.00	2.00	
Standard lump.....	St. Louis.....	2.40	2.15	2.15	2.00@	2.35
Standard mine run.....	St. Louis.....	1.85	1.80	1.80	1.75@	1.85
Standard screenings.....	St. Louis.....	1.00	1.20	1.20	1.15@	1.25
West Ky. lump.....	Louisville.....	2.20	2.10	2.10	2.10@	2.35
West Ky. mine run.....	Louisville.....	1.75	1.55	1.60	1.40@	1.85
West Ky. screenings.....	Louisville.....	.90	1.15	1.15	1.15@	1.25
West Ky. lump.....	Chicago.....	2.10	2.05	2.05	2.25@	2.45
West Ky. mine run.....	Chicago.....	1.30	1.60	1.60	1.35@	1.75
South and Southwest						
Big Seam lump.....	Birmingham.....	3.50	3.40	3.40	3.30@	3.50
Big Seam mine run.....	Birmingham.....	1.95	1.75	1.75	1.50@	2.00
Big Seam (washed).....	Birmingham.....	2.35	2.00	2.00	1.75@	2.25
S. E. Ky. lump.....	Chicago.....	3.10	2.10	2.10	2.25@	2.75
S. E. Ky. mine run.....	Chicago.....	1.80	1.50	1.50	1.35@	1.90
S. E. Ky. lump.....	Louisville.....	2.85	2.10	2.10	2.00@	2.25
S. E. Ky. mine run.....	Louisville.....	1.85	1.55	1.55	1.25@	1.75
S. E. Ky. screenings.....	Louisville.....	1.00	.95	.95	.85@	1.10
S. E. Ky. lump.....	Cincinnati.....	3.25	2.35	2.35	2.25@	2.50
S. E. Ky. mine run.....	Cincinnati.....	1.60	1.45	1.45	1.40@	1.75
S. E. Ky. screenings.....	Cincinnati.....	1.05	.90	.95	.85@	1.15
Kansas lump.....	Kansas City.....	4.00	4.50	4.50	4.50	
Kansas mine run.....	Kansas City.....	3.25	3.50	3.50	3.50	
Kansas screenings.....	Kansas City.....	2.60	2.50	2.50	2.50	

\* Gross tons, f.o.b. vessel, Hampton Roads.

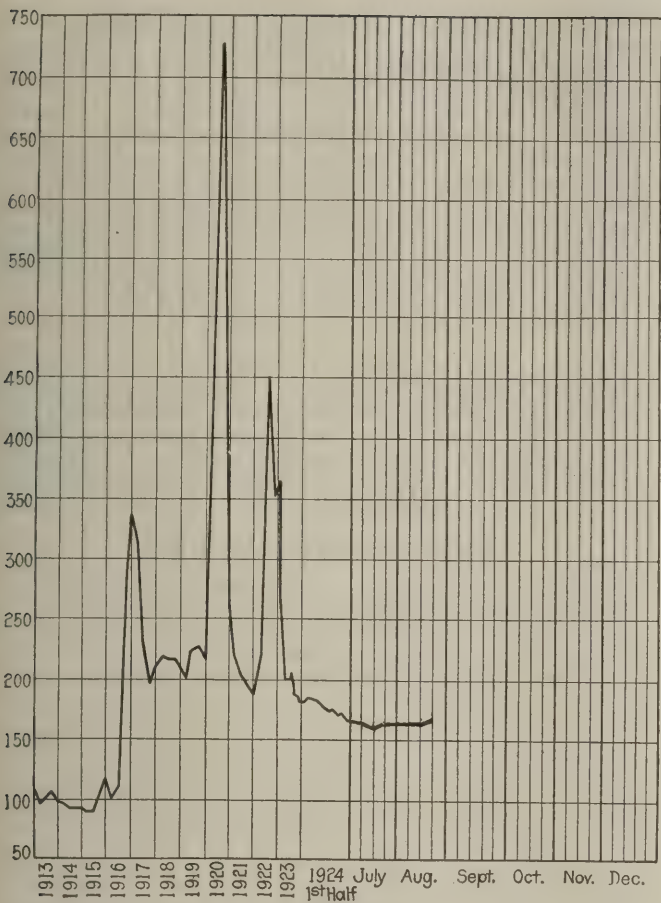
† Advances over previous week shown in heavy type, declines in italics.

## Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

	Market Quoted	Freight Rates	Aug. 20, 1923		Aug. 11, 1924		Aug. 18, 1924†	
			Independent	Company	Independent	Company	Independent	Company
Broken.....	New York.....	\$2.34		\$7.75@ \$8.35		\$8.00@ \$9.10		\$8.00@ \$9.10
Broken.....	Philadelphia.....	2.39		7.90@ 8.10		8.90@ 9.05		8.90@ 9.05
Egg.....	New York.....	2.34	\$8.50@ 12.50	8.00@ 8.35	\$8.50@ \$8.75	8.65@ 9.10	\$8.35@ \$8.75	8.65@ 9.10
Egg.....	Philadelphia.....	2.39	9.25@ 11.00	8.10@ 8.35	9.00@ 9.70	9.00@ 9.05	9.00@ 9.70	9.00@ 9.05
Egg.....	Chicago.....	5.06	8.50@ 12.00	7.25@ 7.45	8.10@ 8.25	8.02@ 8.12	8.09@ 8.20	8.03@ 8.10
Stove.....	New York.....	2.34	8.50@ 13.00	8.00@ 8.35	9.25@ 9.60	8.65@ 9.45	9.25@ 9.60	8.65@ 9.45
Stove.....	Philadelphia.....	2.39	9.25@ 11.00	8.15@ 8.35	9.35@ 10.00	9.05@ 9.10	9.35@ 10.00	9.05@ 9.10
Stove.....	Chicago.....	5.06	8.50@ 12.00	7.25@ 7.45	8.40@ 8.60	8.30@ 8.45	8.40@ 8.60	8.43@ 8.53
Chestnut.....	New York.....	2.34	8.50@ 12.50	8.00@ 8.35	8.25@ 8.75	8.65@ 9.15	8.25@ 8.75	8.65@ 9.15
Chestnut.....	Philadelphia.....	2.39	9.25@ 11.00	8.15@ 8.35	8.85@ 9.80	9.00@ 9.05	8.85@ 9.80	9.00@ 9.05
Chestnut.....	Chicago.....	5.06	8.50@ 12.00	7.25@ 7.45	8.20@ 8.32	8.24@ 8.38	8.18@ 8.33	8.28@ 8.34
Range.....	New York.....	2.34		8.30		8.90		8.90
Pea.....	New York.....	2.22	6.75@ 8.50	6.00@ 6.30	4.50@ 5.25	5.50@ 6.00	4.25@ 5.25	5.75@ 6.00
Pea.....	Philadelphia.....	2.14	7.00@ 7.50	6.15@ 6.20	5.75@ 6.25	5.75@ 6.00	5.75@ 6.25	5.75@ 6.00
Pea.....	Chicago.....	4.79	7.00@ 8.50	5.30@ 5.65	5.15@ 5.60	5.36@ 5.91	5.23@ 5.55	5.36@ 5.91
Buckwheat No. 1.....	New York.....	2.22	3.00@ 3.50	3.50@ 4.15	2.00@ 2.25	3.00@ 3.15	2.00@ 2.25	3.00@ 3.15
Buckwheat No. 1.....	Philadelphia.....	2.14	3.50	3.50	2.50@ 3.00	3.00	2.50@ 3.00	3.00
Rice.....	New York.....	2.22	2.25@ 2.50	2.50	1.70@ 2.00	2.00@ 2.25	1.70@ 2.00	2.00@ 2.25
Rice.....	Philadelphia.....	2.14	2.50	2.50	2.00@ 2.25	2.25	2.00@ 2.25	2.25
Barley.....	New York.....	2.22	1.25@ 1.50	1.50	1.15@ 1.40	1.50	1.15@ 1.40	1.50
Barley.....	Philadelphia.....	2.14	1.50	1.50	1.50	1.50	1.50	1.50
Birdseye.....	New York.....	2.22		1.60		1.60		1.60

\* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.





Index .....	1924			1923
	Aug. 18	Aug. 11	Aug. 4	Aug. 20
Weighted average price .....	165	163	163	197
	\$2.00	\$1.98	\$1.98	\$2.38

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board.

Louisville Breathes More Easily

The feeling in Louisville is much better than it has been, for the fall demand for prepared sizes is developing, with much better general demand scattered over various sections of the country. Eastern Kentucky operators are busier than they have been, and have fewer cars of unsold coal on track. Some of them claim that except for the industrial demand for screenings the price would have been reduced and prices of prepared coal correspondingly increased. Indications are that there will be advances of 25@50c. a ton on prepared sizes by the end of the month, or early in September, regardless of the screenings market, which will break if prepared demand improves.

Demand in the western Kentucky producing sections is improving somewhat on scattered orders from various sections for prepared sizes, while increased industrial activity is taking care of present production of screenings, which is a shade higher than they have been and in good demand. As a result of better demand and better operating time, and with about half the field still strike bound, there is an upward tendency in the price quoted.

Northwest Growing More Hopeful

Trade in Duluth generally is stronger, although Kentucky run-of-pile was reduced to \$5.50 from \$5.75. Forty-three cargoes arrived this week of which eleven were anthracite. There will be probably plenty of hard coal in the Northwest this year to meet requirements. Twenty-two cargoes are reported on the way from lower lake ports and of these five are hard coal.

The anthracite market seems to be starting, the weather being unseasonably cold. Inquiry is better in bituminous. The iron mines are preparing to start operations.

Prices on soft coal in the Twin Cities remain about as they have been for some time. So southern Illinois coal has been on the basis of \$2.75@3 for some time. Dock prices are unchanged.

The volume of business in the Milwaukee coal market continues unchanged. The slight spurt in buying, heretofore noted, has subsided and business is quiet with buyers showing a total lack of interest both in city and country. Lake receipts are slow. Thus far cargo receipts of anthracite aggregate 412,488 tons and of soft coal 1,519,893 tons. This represents a falling off of 20 per cent in the former and about 33 per cent in the latter compared with last year's receipts up to this time.

Business is slow to pick up in the Southwest. Prices are unchanged from last week. Arkansas semi-anthracite is \$5.50 to \$7 for lump; \$3.50 for mine run and \$2 for screenings. Henryetta, Okla., lump is \$4.50; nut, \$4; mine run, \$3.25 to \$3.50 and screenings, \$2.

The market in Colorado shows little, if any, change from last week. Though a number of inquiries have been received coal sales are still slow with dealers buying only that for which they have immediate need. The mines averaged twenty hours last week with 48 per cent of the working time lost on account of lack of market. Prices are unchanged.

In Utah the mines are working about three days a week. Prices are unsettled. Only domestic lump is moving satisfactorily. The metal-mining industry is providing a fair market for coal. The sugar factories are taking some slack and the railroads are buying a little more coal than they were, but both the latter markets are poor. The Central Western Regional Advisory Board has passed a resolution urging all consumers to buy their supplies now.

Cincinnati Just a Little Happier

Prices have changed a little in Cincinnati during the past week, and the undertone is firmer, for consumers are now disposed to buy.

Bituminous coal for domestic use is passing in greater volume to the Northwest and the minimum price for steam slack has increased owing to a decreased production of block and 4-in. lump. Run-of-mine also is a bit stronger. Egg and 2-in., the favorite lake sizes, are the only makes that have failed to show a definite price change.

With a slightly better feeling in domestic coal circles the Columbus coal trade continues to show a better tone. Dealer buying is now the best feature. Some retailers still have good stocks, but others are almost to rock bottom and are coming into the market. City dealers are having a better trade but hardly up to normal for the time of year. Householders are showing preference for smokeless, splints and Kentucky varieties, although a fair quantity of southern Ohio coal is moving. Demand for steam tonnage shows no material improvement. Slack is plentiful and prices weak, although there is now less demurrage coal on the local market. Production shows only slight increases. In the Hocking Valley and Pomeroy fields the output is about 15 per cent of capacity. Lake trade is showing signs of a let-up owing to congestion at some of the lower lake ports.

Pittsburgh Slowly Recovers

In the last two months there has been a noticeable increase in production in the Pittsburgh district, but this has represented increased business between operators and their regular customers rather than heavier sales in the open market. The former business replaces the usual contracts for the coal year and is subject to periodic adjustments. For the Pittsburgh district steam mine-run these have averaged close to \$1.90 right along. Some business is done probably at \$2, but little if any as low as \$1.75, that being a price reached in the spot market frequently by small operators who have no regular trade and often sell through dealers. Some coal has been shipped in the lake trade but for affiliated interests.

Some Connellsville operators are trying to sell steam coal, coal that, running above the sulphur limit for coking, is otherwise good in analysis, but soft. This often sells at \$1.50 and sometimes at \$1.40. Connellsville Sewickley, better in structure but not in analysis, sells as low as \$1.10.



Operators and jobbers report that in general the demand for steam fuel in eastern Ohio shows an improved tone with inquiries more numerous and more odd-lot buying. Some industrial contracts have been made during the past few weeks covering fuel requirements up to March 31 next. Domestic trade also is improving. Retail yards are more active. The strongest demand and weakest supply in the steam trade is for slack and nut and slack, which accounts for a stiffening in prices on these grades.

Some shippers to the Buffalo market, mostly near producing centers, are asking a little more for their coal, but Buffalo shippers decline to pay it. Bituminous prices remain unsteady at \$2.25@2.50 for Youghiogheny gas lump, \$2@2.25 for Pittsburgh and No. 8 steam lump, \$1.50@1.75 for all mine run and \$1.10@1.25 for slack.

### New England Not at All Cheerful

The slightly firmer price tendency in tidewater coal at Boston, noted in last week's issue, has entirely disappeared so that \$5.40 gross ton on cars, Boston, has been the going figure for New River and Pocahontas. It is reliably reported that one shipper has offered good quality coal at \$5.25 on cars if a large tonnage is purchased. The offering of a cargo of nut and slack at about \$5.25 on cars Boston made buyers surmise that there had been further break in mine-run prices and buying slowed considerably. For mine-run coal, \$5.40 on cars, Providence, is as low as is known to have been named this week, but \$5.50 has been obtained not infrequently and a little tonnage actually brought \$5.60. Some, not Pool No. 1, has been offered at \$5.25 on cars, Providence.

The southern loading ports have shipped quite freely the past week and stocks are large at privately owned docks. High-grade low-volatile coal is reported as offered at \$4 gross ton, f.o.b. Hampton Roads, but local shippers have been unable to pick up quality coal in cargo lots at less than \$4.10 and \$4.20 has been paid. This does not mean, however, that no \$4 coal has been shipped to New England.

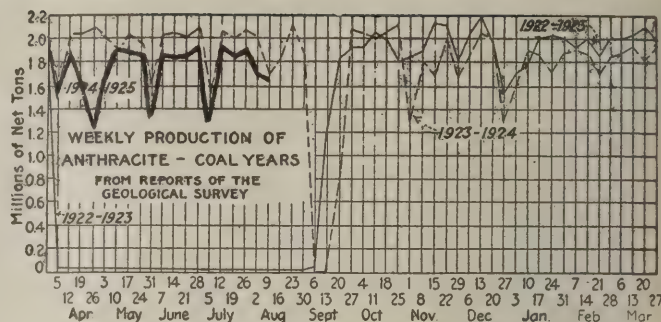
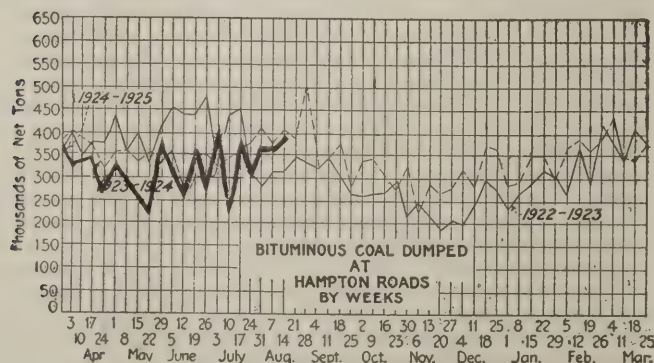
The all-rail bituminous market remains dull though a little more active in the past week. A few small lots of choice steam coal have sold at \$2.90 net ton, mines, in the face of offerings of certain Pool No. 1 at \$2.35.

Coastwise vessel freights are firming noticeably, 80@85c. now being demanded for steamers of about 5,000 tons, Hampton Roads to Boston, against 70c. a few weeks ago. For this size of boat to Providence 75c. has been refused the past week and 80c. demanded. The larger tonnage craft—7,500 tons—can be chartered to Boston at 65c.

### More Inquiries in Atlantic Coast Markets

In the soft-coal market of New York there is no change of consequence, but an increased number of inquiries have been received. It is thought that the trade has passed through the worst of the depression. A feature of the local market in an unfavorable way is the low rate of freight being quoted from Hampton Roads. It has the effect of curtailing still more the market for Pennsylvania coal.

No one can get enthusiastic about the improvement in the Philadelphia market, as the tonnage moved is still light, though increasing. The smaller users, who ask for prices about this time of the year, are making inquiries and buying a few cars. There is still much conflicting opinion as to business conditions. Railroads are only taking their normal supply of fuel, with no disposition to stock-up. Prices are unchanged.



Baltimore soft-coal jobbers and operating interests admit freely that they cannot point to any specific improvement in the situation there or at the mines. Nevertheless a decidedly more optimistic feeling is exhibited in local offices, probably because inquiries are beginning to drift in slowly from industries which have been either closed or operating on a part time schedule for some time past. Demand is poor.

### Public Not Buying Anthracite

During the past week the anthracite market in New York has slowed down even more than before. Even stove coal is in less active demand. It is thought that the unusually warm spell may have had an effect upon the retail trade, that was reflected in the wholesale market after the lapse of a few days. Stove is the only coal selling above the company circular, and even that is dragging a bit now.

Philadelphia records a faint indication of betterment in the retailing of hard coal. The big producers for the third week are running on a four-day schedule, and but few of the independents have been able to avoid short time.

The retailer is disposed to fill all vacant spaces with nut coal. Experience tells him that it will be well to have it on hand long before the first of the year. Prices at the mines are stabilized, and none of the more responsible concerns show any indication of shading them. The demand for stove does not waver, but as most of the buying is for the winter, the dealers are content to wait their turn for it. Pea and egg are still a bit quiet. The big mining companies are not storing prepared sizes this year so the public cannot draw from that source in the winter. Steam coals are still dull, barley being in best demand.

The hard-coal purchasing public of Baltimore remains largely unresponsive to the appeals of anthracite coal dealers to place their orders quickly. Coal retailers have declared without result that there will probably be another 25c. per ton advance in prices on Sept. 1.

In Buffalo the anthracite trade is slow as ever, many people not earning enough to pay for their winter's supply. In New England the market is good for stove anthracite at \$9.20, but other sizes are not wanted. Egg and nut are \$8.25. Pea and steam sizes are practically unsalable at any figure.

Spot furnace coke is still firm at \$3. There is no distress tonnage. Consumption is believed to have stopped decreasing. No additional furnaces seem likely to go out, but no furnaces are likely to be lighted. An eastern furnace, covered to Oct. 1, has been sounding the market on fourth-quarter contract, and finds the \$3.25 price quoted firmly, but holds out for \$3. Medium-sulphur coke is showing more strength, out for \$2.90, a fairly stiff price seeing that standard coke is only \$3.

Heating coke is fairly steady, but demand is light and first drawings appear every now and then to disturb prices, sometimes going down to \$2.50, when producers would like to obtain \$2.75 on fair grades of heating coke. Foundry coke is rather dull but is quite firm at \$4 to \$4.50.

### Car Loadings, Surpluses and Shortages

		Cars Loaded	
		All Cars	Coal Cars
Week ended Aug. 2, 1924.		945,731	144,865
Previous week.		925,859	146,057
Week ended Aug. 4, 1923.		1,033,130	190,519
		Surplus Cars	
		All Cars	Coal Cars
* July 31, 1924.		322,530	146,840
Previous week.		344,892	158,606
July 31, 1923.		76,453	6,546
		Car Shortage	
		9,570	4,774



## Foreign Market And Export News

### Steadier Tone in British Coal Market; Output Jumps 521,000 Tons

The South Wales coal market reflects an increased steadiness of tone, with a slight improvement in inquiries, especially for large admiralty and bunker smalls. The volume of business, however, continues at such a low level that a number of operations are finding it difficult to work on a profitable basis. Therefore it would not be surprising if several collieries were to close down soon.

Output by British collieries, a cable to *Coal Age* states, registered a marked increase during the week ended Aug. 2, 5,010,000 tons having been produced, according to the official reports. This compares with a production of 4,489,000 tons during the week ended July 26.

British coal exports during the first half of 1924 declined 8,714,299 tons from the figures of the corresponding period in 1923, due to less buying on the part of Germany, Holland, Belgium and France, according to a report to the Department of Commerce by Trade Commissioner C. E. Lyon, at London. The United States took but 55,000 tons in 1924 as compared with 659,354 tons during the corresponding period of the previous year, when abnormal conditions existed.

### Spanish Mine Owners Would Limit Coal Imports

At a conference of Spanish coal producers held recently in Madrid it was decided to petition the government to institute measures to increase the use of domestic mined fuel. A strict tariff is recommended and also the erection of electric central stations in the neighborhood of pits. It is also proposed that foreign imports be limited, that all the national services (army, navy, etc.) and industries be compelled to use only Spanish coal and that the floating depots which are used for storing imported coal be abolished. The import duties and taxes adjusted so that Spanish coal will benefit at the

expense of the product of foreign mines. It is urged in support of the recommendation that Spanish miners are working only 5½ hours daily against 7 in foreign mines.

### French Domestic Demand Firm; Industrial Coal Week

The situation in the French coal market is unchanged. On the whole the demand for industrial coals continues weak, though it is increasing somewhat in some sections. House coals are in a satisfactory position and coal producers are committed well into the fall.

Deliveries of coke to the O.R.C.A. for the month of July amounted to 358,861 tons, or a daily average of 11,577 tons. For the first five days of August the deliveries through Ehrang and Aix-la-Chapelle were 39,525 tons, a daily supply of 7,905 tons. Deliveries are being curtailed at the request of French industrialists, who find themselves unable to find storage space for any more coal. Meantime fuel is being temporarily stored in the Ruhr.

The price of coke has not been changed and probably will remain on the present level (150.75 fr. all O.R.C.A. charges included) for the month of August.

Indemnity fuel deliveries for the first twenty-eight days of July to France and Luxemburg were 346,288 tons of coal, 454,689 tons of coke and 22,616 tons of lignite briquets, a total of 823,593 tons.

Agreements with the M.I.C.U.M. are to be prolonged on the following basis: (1) Gratuitous deliveries of reparation coal will be continued as in the past. (2) Licenses and derogation levies will be reduced by 50 per cent as of Aug. 1. (3) The coal tax is reduced to 25 pf. per ton from Aug. 1. (4) The coal tax for July is reduced to 50 pf.

This agreement has been renewed

until such time as the Dawes plan is put in operation. However, as from Aug. 15, the Commission of the Six (German industrialists) will have the right to denounce this agreement on five days' notice. When these accords were renewed on June 30 the different taxes and levies had already been reduced 50 per cent. This further reduction will oblige France to finance deliveries a little more than during the past by an increased deduction from the guarantee funds. It is not known yet in what measure the Reich will intervene financially, but its intervention seems now quite feasible as its budget presents a credit balance.

### Export Clearances, Week Ended Aug. 16, 1924

#### FROM HAMPTON ROADS

	Tons
For Canada:	
Dan. Str. Anna Jensen for Halifax.	2,076
Ital. Str. Labor for Three Rivers...	5,640
For Cuba:	
Br. Str. Berwindmoor for Havana...	9,646
For Germany:	
Ger. Str. Emden for Hamburg	4,618
For Italy:	
Ital. Str. San Gluseppi for Porto Ferrajo	7,030
Ital. Str. Robilante for Porto Ferrajo	9,653
Jap. Str. Kofuku Maru for Genoa	7,789
For South Africa:	
Nor. Str. Skogheim for St. Lucia...	3,847

#### FROM BALTIMORE

For Cuba:	
Amer. Str. Mangore for Daiquiri...	5,521

#### FROM PHILADELPHIA

For Cuba:	
Nor. Str. Vindeggen for Antilla...	
For Italy:	
Jugoslav. Str. Vojvoda Putnik for Genoa	

### Hampton Roads Pier Situation

N. & W. Piers, Lamberts Pt.:	Aug. 7	Aug. 14
Cars on hand.....	1,761	1,680
Tons on hand.....	103,404	103,370
Tons dumped for week.....	122,403	156,371
Tonnage waiting.....	25,000	25,000
Virginian Piers, Sewalls Pt.:		
Cars on hand.....	1,118	1,253
Tons on hand.....	80,700	94,700
Tons dumped for week.....	94,411	80,119
Tonnage waiting.....	2,250	15,880
C. & O. Piers, Newport News:		
Cars on hand.....	1,526	1,334
Tons on hand.....	80,333	73,100
Tons dumped for week.....	103,646	116,696
Tonnage waiting.....	9,200	5,670

### Pier and Bunker Prices, Gross Tons

PIERS	Aug. 9	Aug. 16†
Pool 9, New York.....	\$5.25@ \$5.40	\$5.25@ \$5.40
Pool 10, New York.....	4.25@ 4.50	4.25@ 4.50
Pool 11, New York.....	4.00@ 4.15	4.00@ 4.15
Pool 9, Philadelphia.....	4.70@ 5.00	4.70@ 5.00
Pool 10, Philadelphia.....	4.45@ 4.70	4.45@ 4.70
Pool 11, Philadelphia.....	4.30@ 4.50	4.30@ 4.50
Pool 1, Hamp. Roads....	4.15	4.15
Pool 2, Hamp. Roads....	4.05	4.05
Pools 5-6-7 Hamp. Rds.	4.00	4.00

#### BUNKERS

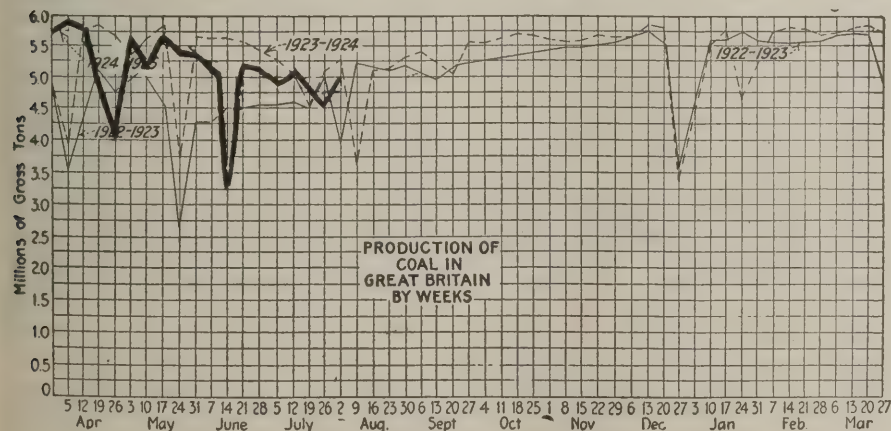
Pool 9, New York.....	5.00@ 5.25	5.00@ 5.25
Pool 10, New York.....	4.75@ 5.00	4.75@ 5.00
Pool 11, New York.....	4.50@ 4.75	4.50@ 4.75
Pool 9, Philadelphia.....	5.00@ 5.30	5.00@ 5.30
Pool 10, Philadelphia.....	4.75@ 4.95	4.75@ 4.95
Pool 11, Philadelphia.....	4.50@ 4.70	4.50@ 4.70
Pool 1, Hamp. Roads....	4.20	4.20
Pool 2, Hamp. Roads....	4.10	4.10
Pools 5-6-7 Hamp. Rds.	4.00	4.00

### Current Quotations British Coal f.o.b. Port, Gross Tons

#### Quotations by Cable to *Coal Age*

	Aug. 9	Aug. 16†
Admiralty, large....	28s. @ 28s.6d.	28s. @ 28s.6d.
Steam smalls.....	17s.	17s.
Newcastle:		
Best steams.....	21s.	22s. @ 22s.6d.
Best gas.....	23s.	22s. @ 22s.6d.
Best bunkers.....	20s.	20s.6d.

† Advances over previous week shown in heavy type, declines in italics.







## News Items From Field and Trade



### ALABAMA

The Dixie Coal Mining Co. is erecting a new washery at the McCollum mine, Walker county near Jasper.

A state-wide first-aid meet will be held in Birmingham, Oct. 7, under the auspices of the U. S. Bureau of Mines and the Alabama Coal Mining Institute. Teams desiring to participate in the meet must file applications with J. J. Forbes, U. S. Bureau of Mines, Federal Building, Birmingham, Ala., on or before Sept 15.

The Sayre mines, in the western part of Jefferson County, Alabama, near Birmingham, belonging to the Gulf States Steel Co., are the first coal mines in Alabama to protect thoroughly the interior of the mines with limestone dust, 20,000 lb. of limestone dust being used.

The new development work of the Moss and McCormack Mining Co., near Carbon Hill, Walker County, is making good progress, an extension being made to the new mine from the spur of the Frisco Railroad serving No. 11 mine of the Calloway Coal Co. The company has opened an office at Carbon Hill and C. E. Crandell is superintendent in charge of the work. The lands on which the development is being made were obtained from the federal government when the royalty rights were auctioned by the land department a year or more ago.

### ARKANSAS

Scranton Anthracite Coal Co. is pumping out its mine and will soon resume.

### COLORADO

The thirty coal salesmen for the Colorado Fuel and Iron Co. spent a week early in August visiting the company's mines and comparing notes at the headquarters in Denver.

Three 500-ft. entries have been driven by the Moffat Coal Co. in the Elkhead country and a wagon road is being built. The coal is said to be a fine grade of anthracite. It is hoped to have a railroad built to the mine by the time the great Moffat tunnel is completed.

An explosion in the new Alamo mine near Walsenburg, early on the morning of August 5th, killed Alex MacBirnie, a fireboss and shut down the mine for a week. The man was alone at the time of the explosion. His body was found partly covered by a fall of the roof. There were evidences all around indicating that an explosion had been generated at that spot. The mine

which is still in its development stage, was not seriously damaged according to Harry F. Nash, general manager.

G. W. Harris of Denver, president of the Colorado and Utah Coal Co., is back at his desk after suffering a broken leg, sprained ankle and lacerated scalp in an accident last month. An automobile struck him as he was riding a horse. He was thrown clear over the machine and the horse capped the climax by falling on him.

The Bluff Springs Coal Co., which operates south of Florence, is making expansions and improvements. A spur will be built from the Santa Fe branch at Nushaft to the Bluff Springs mine, a distance of 2,200 ft. The old Donnelly slope has been taken over by the company, and a tippie will be built to accommodate it.

Two recent reorganizations in Colorado coal companies have been effected. W. W. Cowdery becomes president and general manager of the Crown Fuel Co. with a mine near Gorham. R. A. Pierce, former general superintendent and part owner is now chief engineer for the Colorado and Utah Coal Co. and W. A. Snyder, former general manager leaves the company. The Leyden Coal Co. also has undergone a shrinkage of executive forces. General Manager W. D. McCausland and General Supt. James Virgin withdrawing. John A. Sire is general superintendent and operating head of the mine organization. The entire sales force has been dismissed. The output will be sold by the Barnett Fuel Co. of Denver, wholesalers.

### ILLINOIS

A fire recently wiped out the business section of Freeman, a small mining town six miles southwest of West Frankfort. The damage is estimated at \$35,000. Ten frame structures, including seven business houses, a garage and two dwellings were burned. A change in the wind at the height of the fire was credited with saving the entire town from destruction.

### INDIANA

Enos Coal Co., of Cleveland, Ohio, has purchased 145 acres of coal land near Petersburg from R. R. Williams of Evansville and \$100,000 of land from several other holders.

The McClelland Coal Co. has announced that its mine south of Terre Haute would re-open after several months' idleness. Two hundred men will return to work and within a short time from fifty to one hundred more

men will be placed at work there. Several of the larger mines in the Terre Haute-Clinton fields and in the field south of Terre Haute, recently have resumed operations.

### KENTUCKY

The Kentucky Railroad Commission on Aug. 1 granted permission to the Chesapeake & Ohio R.R. to operate the Long Fork, Millers Creek and Ashland Coal & Iron Railroads, which the C. & O. arranged to take over some time ago, as feeders in its eastern Kentucky territory.

Announcement has been made by Willard R. Jillson, Kentucky geologist, of a new book to be issued shortly, on "The Mountains of Eastern Kentucky," as prepared by Professor D. H. Davis, geographer of the University of Minnesota, who has spent several summers studying Kentucky coal, oil and other resources. Coal, says Professor Davis, was noted in the Kentucky basin by Christopher Gist as early as 1759.

Reports from Owensboro state that the new Owensboro, Rockport & Chicago Ry. Co., which has asked the Interstate Commerce Commission for right to build a bridge and eighty-four miles of road to Elnora, Ind., there connecting with the Chicago, Milwaukee & St. Paul to the North and Northwest, is also discussing plans for building the line to Central City, Ky., in the heart of the western Kentucky coal fields.

The Hardy-Burlingham Mining Co., at Hardburley, Lotts Creek, Hazard field is said to be planning to make new openings and increase capacity. The company is said to have the largest capacity wooden tippie in the field, and its output does not nearly equal its capacity. It was also reported that the East Kentucky Coal Co., at Fusonia, Ky., had resumed operations, with some large orders, after being down for months.

The State Tax Commission has certified to the auditor of public accounts and the county courts the assessments on five companies in Pike County and one in Hopkins County. All assessments are considerably higher than heretofore. They are as follows: Edgewater Coal Co., \$577,592; Big Sandy Co., \$1,225,010; Consolidation Coal Co., \$1,028,167; Colony Coal & Coke Co., \$393,610; Fordson Coal Co., \$2,975,028. The St. Bernard Mining Co.'s Hopkins County assessment is \$2,393,497.

Engineers have located on the headwaters of Elkhorn Creek, Letcher County, to make surveys for a link be-



tween the Louisville & Nashville R.R. and the Carolina, Clinchfield & Ohio R.R. under a lease approved by Interstate Commerce Commission but not yet accepted by the L. & N. The line if constructed will run from McRoberts, Letcher County to Elkhorn City, Pike County and will give it is said the southeastern Kentucky fields a new outlet, a Gulf Seaboard market and an extended operating area.

## MINNESOTA

The Reeves Coal and Dock Co., which is constructing a new dock at Superior, Wis., has announced that the new dock will be in readiness by the opening of navigation next spring. The present dock which is under demolition will be out of the way early next month.

## MISSOURI

C. A. Norton, for the past four years secretary and treasurer of the Wallace Coal Co., has resigned to engage in another line of business in Chicago.

Harvey L. Salmon, for many years connected with the fuel department of the Missouri Pacific R.R., has recently resigned to engage in the auto-painting business in the northern Pacific coast. He is associated with B. F. Bush, who recently resigned from the Missouri Pacific as president.

## MONTANA

David Phillips, Henry Brauenstein and Henry Unschied, all of Minneapolis, have reorganized the Gilbert & Crawford Coal Co. operating mines at Roundup.

## NEW MEXICO

The Hagan Coal Mines, Inc., has connected its new mine, 30 miles from Albuquerque, with a Santa Fe spur and is bringing the mine up to a larger production. A steel tippie is now getting its final touches. W. H. Stark of Orange, is interested in this mine.

## OHIO

H. H. Heiner, formerly president of the Maynard Coal Co., who has been out of the business since that concern went into the hands of receivers, has been seriously ill with ptomaine poisoning at his home. He is now believed to be out of danger.

Joe Richards, general manager of the Blue Diamond Coal Co.'s mines, who has been ill for the past 15 months, a large part of which was spent in a hospital at Lexington Ky., is able to be about once more and is convalescing near Winchester, Ky.

The Southern Ohio Coal Exchange reporting for the week ending July 22 shows a total production of 79,279 tons from 439 mines reporting, which had a combined capacity of 638,285 tons. This leaves a shortage of 559,006 tons. Labor shortage was responsible for a loss of 8,583 tons; strikes, 8,825 tons; mine disability, 5,075 tons and "no market" 536,523 tons.

Following a series of meetings of the officials of the Southern Coal & Coke Co. it is said that N. L. Mahan, sales manager at Cincinnati, will resign as of Sept. 1 and will be succeeded by Louis Stone. E. L. Gatliff is slated to become secretary of the company. It is also understood that one of the group of mines of the Southern has been sold and another is on the market. On the other hand there is said to be a move on foot to consolidate still more mines with this group.

Imposition of a tax on every ton of coal mined in Ohio has been suggested by the Ohio State Teachers' Association as a means of financing the schools in mining districts of the southern and southwestern sections of the state. In spite of the great natural wealth of the mining districts, revenues received from taxation are totally inadequate properly to finance the schools.

The Association says that in the schools districts of the mining sections, the coal in the ground is listed for practically nothing, though, a steady stream

of wealth pours forth on which no taxes are collected.

Grover C. Angel, sales manager for the Main Island Creek Coal Co. for several years past, has resigned. B. Lee Hutchinson, who was largely instrumental in the consolidation of the various entities of the Hutchinson Island Creek Coal Co. will take over this work as general sales manager. Main offices in Cincinnati have been engaged and a further change may be made in the name of the corporation. "Big Mac" McAllister, who had charge of the Main Island Creek mines, with headquarters at Omar, W. Va., it is understood, will direct the mechanical affairs of the new organization.

Columbus operators were notified recently that the Hocking Valley R.R. has placed an embargo against all coal from connecting lines, even the Chesapeake and Ohio, of which the Hocking Valley road is a subsidiary. The reason for this action, which is unusual at this time of the year, is that the Hocking Valley has 5,400 cars of coal on the line between Columbus and Toledo. The congestion is due to the fact that many boats have been withdrawn from service at Toledo, so that the coal cannot be taken to the docks in the Northwest as rapidly as it is received at Toledo. Some boats have been taken off temporarily as the owners do not care to take coal up the lakes unless there is a downward bound cargo of iron ore and the movement of ore is light at this time.

## PENNSYLVANIA

Thomas J. Bray, of Youngstown, Pa., president of the Republican Iron & Steel Co., suffered a heat stroke Aug. 10, at the Oakmont Country Club, Oakmont.

Stock in the Lehigh Valley Coal Co. is being sold to employees on the monthly payment plan, deductions being made on the payroll on request of the applicant at the rate of \$3 per share per month, instalments paying interest at 6 per cent.

Production in central Pennsylvania for the week ending Aug. 9, was 11,482 car loads, as compared with 11,330 car loads for the previous week. The total production for August to and including the ninth, was 14,234 car loads, against 12,129 cars for the same period in July. However, the July period had a holiday season which cut down the production.

Miners employed by the Consumers Fuel Co. at Harmarville struck Aug. 7, a few days after they had returned to work after a six-weeks' lay-off due to lack of orders. The strikers complain against working conditions and agreements. Officials ordered the men to take their tools and leave the workings.

The State Workman's Compensation Board has dismissed the appeal of the Pennsylvania Coal & Coke Co. from the award to the widow of Mike Harchuck who died of blood poisoning. When working on a pipe line his fingers were hurt and death followed a few weeks later. The company contended,



Courtesy U. S. Distributing Corp.

## Tippie at Dietz, Wyo., of Sheridan-Wyoming Coal Co.

In the northern part of Wyoming is a coal area known as the Sheridan field, it being named after the principal town of the northern half of the state. The principal centers in this coal area are Sheridan, Acme, Carney, Monarch, Kooi and Dietz. The field is adjacent to the Fort Mackenzie Military Reservation.



and presented testimony tending to show, that his blood had been poisoned in a blood-letting operation.

Two miners lost their lives Aug. 6, three others were seriously injured and one hundred miners had narrow escapes when a rock-fall occurred in Springfield Mine No. 1 in Nant-y-Glo, Cambria county. The fall occurred just as the day shift was entering the mine, in a trip of twenty mine cars. They were one half mile from the entrance when many tons of rock gave way, burying two of the wagons.

The Neilson colliery, at Shamokin, which has been acquired by a group of Wilkes-Barre investors, has been re-financed and work is to be started shortly. It is estimated by the company's engineers that with sixteen beds of coal, about 24,000,000 tons of virgin coal is available. The improvements to the present operation include an electrically equipped breaker, capable of preparing 1,500 tons of coal daily.

Two deaths were caused within a few minutes Aug. 10 by a high tension electric wire at the entrance to the No. 3 mine of the H. C. Frick Coke Co. at Mt. Pleasant. One of the fatalities occurred when a man who had gone to investigate the death of the first victim, a boy, lost his balance and seized the wire as he fell.

The boy was picking coal, when in some undetermined manner, he came into contact with the high voltage wire.

The Northwestern Mining & Exchange Co. and the Blossburg Coal Co., of DuBois, Pa., announce the signing of a contract with the Peabody Coal Co., by which the latter company will continue to manage the mines of the former companies for a period of ten years. The Blossburg Coal Co. has three mines which produce a total of 1,000 tons per day. Seven mines of the Northwestern Mining & Exchange Co. yield 5,000 to 6,000 tons daily. The new Kramer mine of this company is involved in the contract. At present it is producing only 400 tons of development coal per day. It is equipped to handle 4,000 tons per day; early in the fall it will start to run room-and-pillar coal. When running at capacity all these mines will produce about 10,000 tons of coal per day.

## WEST VIRGINIA

The E. E. White Coal Co. has had for several months a blanket insurance on the life of every one of its employees. The family of a colored employee, who died at Glen White recently, is the first beneficiary.

The Island Creek Coal Co. has completed work on a new steel tippie at its No. 14 mine at Holden, W. Va., which mine is again in operation. A new steel tippie replacing an old wooden structure at No. 1 mine of the Main Island Company at the mouth of Trace Fork has also been completed.

The Flat Top Fuel Co. of Bluefield, W. Va. shipping Pocahontas, Tug River and New River coals, over the Norfolk & Western, the Chesapeake & Ohio and Virginian railways, established a new

world record a few days ago when the British steamship Polovera passed out of Cape Henry en route to Rio de Janeiro, Brazil with 13,599½ tons of coal, the largest tonnage, according to official records, ever loaded on a single ship at the Norfolk & Western piers. The cargo so shipped was valued at about \$53,000.

Tenants will be evicted by the Charleston Coal Mining Co., at Handedley, and by the Coalburg-Kanawha Coal Co., at Coalburg, in order to make way for non-union miners. These mines which made a contract with the union are now attempting to work on an open-shop basis after trying to obtain a wage concession.

Experiments are being conducted by the Bertha Consumers Coal Co. at its Rachel mines at Downs in northern West Virginia with a special type of conveyor, designed by attaches of the company and made by the Fairmont Mining Machinery Co. The conveyor works on a 45-deg. face similar to that used in the V system. Joy and Myers-Whaley loaders are being used at the Eureka mine, Randall, Monongalia county.

Several diamond drills are at work and crop-coal openings are being cleaned out in the Richmond district of Raleigh county. This is regarded as evidence that the railroad up Glade Creek will be extended and more New River coal developed.

The large store and office building, the recreation hall and several residences occupied by department heads of the Superior Pocahontas Coal Co. at Davy, McDowell county, W. Va., were totally destroyed by fire during the closing days of June. The combined store and office building was constructed of native sandstone and three stories high. The loss sustained is about \$100,000. The company will rebuild.

The Brotherhood of Locomotive Engineers has filed an application with the Interstate Commerce Commission for authority to operate the Coal River & Eastern Ry. in interstate commerce between the Coal River Collieries, which are owned by members of the brotherhood, and the Chesapeake & Ohio Ry. The Brotherhood has \$3,000,000 invested in coal properties in southern West Virginia. The application of the Brotherhood is being opposed by the C. & O., which contends that the line is simply a spur and not a part of an interstate transportation system and that the proposed capitalization of \$1,500,000 of the Coal River & Eastern Ry. is grossly exaggerated, the value of the surface rights not being \$750,000 as claimed.

## WISCONSIN

The Great Lakes Coal and Dock Co. has leased the docks in Milwaukee, Wis., formerly occupied by the Central Coal Co.

Paul Galleher, city agent for the Northwestern Fuel Co. at Superior, Wis., has left for St. Paul where he will be in charge of one of the company's city offices. Charles A. Rogers will succeed him.

## WYOMING

The Wyoming & Colorado short line railroad has asked the Interstate Commerce Commission for authority to construct a line from Casper south-west to the state line between Colorado and Utah, 381 miles long. Iron and bituminous coal fields will be traversed by the railroad if built.

## CANADA

On Aug. 2 an explosion occurred at the Midland Collieries, Drumheller, Alta., causing the deaths of three men, Harry Duhockle, outside foreman, James Nichol, pit boss, and Griffith Richards, pump boss. Malcolm Richards, fire boss, was gassed.

Many of the Toronto coal dealers with yards along the water front and in the north-west section of the city are looking for new locations as a result of the work that is to be started on the lake front viaduct and subways in the vicinity of Bloor St. West. Considerable difficulty is being experienced in finding suitable properties with railway sidings.

## Recent Patents

**Mining Machine**; 1,488,518. W. W. Robbins, Lorain, Ohio. April 1, 1924. Filed Dec. 4, 1920; serial No. 428,290.

**Implements for Cleaning the Threads of Miners' Safety Lamps**; 1,488,648. Franklin G. Redington, Wilton, N. D. April 1, 1924. Filed May 7, 1923; serial No. 637,290.

**Coal-Mining Machine**; 1,488,766. John Quist, Mystic, Iowa. April 1, 1924. Filed May 2, 1921; serial No. 466,049.

**Mining and Loading Machine**; 1,489,600. Joseph F. Joy, Pittsburgh, Pa., assignor to the Jeffrey Mfg. Co., Columbus, Ohio. April 8, 1924. Filed Oct. 17, 1916; serial No. 126,150. Renewed March 18, 1921; serial No. 453,477.

## New Companies

With a capital of \$25,000, the **Hatfield Coal Co.**, Covington, Ky., has been chartered by J. T. Hatfield, Charles A. Hunt, and M. H. McLean.

The **Sharon Pond Creek Coal Co.**, Sharondale, Ky., capital \$100,000, has been chartered by William York, Elva H. York and A. B. York.

Papers have been filed with the secretary of state increasing the authorized capital of the **Cleveland & Morgantown Coal Co.**, of Cleveland from \$1,500,000 to \$2,000,000.

The **Diamond Coal and Coke Co.** has been organized at Pittsburgh; capital \$5,000. Incorporators: C. F. Kiefer, Pittsburgh; J. D. C. Miller, Dormont; David E. Meigs, Swissvale.

The **West Coast Collieries Ltd.** has been incorporated with a capital of \$525,000 and head office in Toronto. The company will operate throughout Canada. Arthur W. Holmstead, Douglas L. Ross, Leonard V. Sutton and others are incorporators.

The **Mender-Patton Coal Co.**, 77 W. Washington St., has been chartered with an authorized capital of \$10,000 to mine coal and deal in coal and coke. Incorporators are: William F. Patton, Hazel G. Patton, Earl D. Mender, R. D. Graham and Carl Mathews.

The **Peerless Elkhorn Coal Co.**, chartered recently with an authorized capital of \$150,000, has been organized by the election of F. G. Hatton, president; W. M. Brown, vice-president and George S. Schwartz, secretary. The officers are the same as of the Hatton Brown & Co., Inc., of which company it will be a subsidiary. The new concern has acquired two large properties with two working mines in the Elkhorn field of Kentucky, located on the Big Sandy division of the Chesapeake & Ohio RR. Extensive improvements will be made to increase the capacity of the mines.



## Traffic News

### Perry County, Illinois, Operators Seek to Have Freight Rate Sustained

Sixteen coal companies of southern Illinois, including the Perry County Coal Co., are endeavoring to have sustained a reduced rate on coal recently ruled by the Interstate Commerce Commission. The Alton & Southern Ry. and a dozen other companies are contesting the decision before Circuit Court Judge Crow, of Belleville, Ill.

The freight rate on coal for a thirty-mile haul is to be reduced, if the County Court permits, from 91c. to 70c. per ton and for any distance from thirty to seventy-two miles to 80c. per ton. The railroads say these rates will not be remunerative. The new tariff is ordered for Aug. 25.

### Fight For and Against Twin City Freight Rate

The Twin City Rapid Transit Co., operating the street railway system of these cities, has entered its protest against the revised freight rates on all rail coal, to the interstate commerce commission, following similar action by the Hydraulic Press Brick Co., Minneapolis, the Waldorf Paper Products Co. and the Northern States Power Co., all as large consumers of Illinois coal. On the other hand, the Northwestern Coal Dock Operators' Association has entered a protest against a rehearing of the case. It is still an open question whether there will be enough pressure brought to bear upon the commission to induce a suspension of the new rates on all-rail coal, effective by Sept. 10. Hints have been made of a possible injunction being asked to prevent the rates going into effect.

Superior, Wis., through its city commission, is starting an investigation to determine whether the city is being discriminated against in the matter of coal freight rates.

### Revision of Dockage Rates

The Public Service Commission of New York State has approved a charge on New York Central Lines of 25c. per net ton for unloading from vessel, handling from dock and dumping into lighter on bituminous coal arriving by vessel at West Shore Coal and Ore Dock, Buffalo, and transferred by machinery and other facilities furnished by the West Shore R.R. An allowance of 17c. per net ton will be made to the Ashtabula & Buffalo Dock Co., contractor, for service performed in handling the coal as described above.

## Trade Literature

**National Arches.** M. A. Hoff Co., 814 West Washington Ave., Indianapolis, Ind. Pp. 15; 8 x 11 in.; illustrated. This booklet points out the lower maintenance costs with the use of these arches, their outstanding advantages, ease of installing and replacements.

**American Cast Iron Storage Tank.** Conveyors Corporation of America, Chicago,

Ill. Pp. 11, 4 x 8½ in.; illustrated. This is a sectional tank for the storage of dry, loose, bulky material, such as ashes, coal, etc. The booklet contains table of weights, measures and capacities.

**Manganese Steel Castings for Mines.** American Manganese Steel Co., Chicago Heights, Ill. Catalog No. 5. Pp. 76; 8 x 11 in.; illustrated. Covers the use of manganese steel castings for ball and tube mills, buckets, conveyors, crushers, shovels, etc.

**Wanghammers.** The Denver Rock Drill Mfg. Co., Denver, Colo. Pp. 15; 6 x 9 in.; illustrated. This bulletin is devoted chiefly to describing Model 93, a wet or dry sinker, and Model 95, a dry sinker. Model 37, heavy duty sinkers, drifting drills, stopers, drill steel sharpener, drill steel puncher, and comparascope are among the equipment mentioned.

**Industrial Lubrication.** Waverly Oil Works Co., Pittsburgh, Pa. Pp. 44; 3½x6½ in. The lubrication charts in the back of this book should prove interesting to anyone who has to do with the lubrication of machinery.

**Heine Cross-Drum Boilers.** Heine Boiler Co., St. Louis, Mo. Bulletin No. 53. Pp. 29; 8x11 in.; illustrated. Describes the M and MC types of Heine boilers, the former equipped with horizontal baffles and the latter with cross baffles.

**Tramrail.** Cleveland Crane & Engineering Co., Wickliffe, Ohio. Catalog No. 3 Pp. 220; 8x11 in.; illustrated. Describes system of hoisting and conveying loads for warehouses, etc.

The Crouse-Hinds Co., Syracuse, N. Y., recently issued the following bulletins: **New Ideas in Electric Hand Lanterns.** Folder No. 10. **Vaporproof Condulets with Reflectors.** Bulletin No. 2057. **Condulets for Concealing in Concrete.** Bulletin No. 2059. The bulletins are 4x9 in., illustrated.

Sullivan Machinery Co., Chicago, Ill., recently issued the following bulletins: **Vacuum Pumps.** Bulletin 78-B; 11 pp.; describes its straight-line steam-driven and belt-driven vacuum pumps for vacuum service. **Belt-Driven Air Compressors.** Bulletin 77-K; 16 pp.; describes the Sullivan belt-driven wafer-valve air compressors, class WG-6 single stage and class WH-6 two-stage. This company also has issued new editions of Bulletin 77-H, **Angle Compound Compressors**, and Bulletin 70-X, **Compressed Air Spader.** These bulletins are all 6x9 in. and illustrated.

## Obituary

**John P. Hebenstreit**, aged seventy-five, superintendent and vice-president of the Illinois Coal Corporation, recently died of apoplexy, at his home in Nokomis, Ill. He was one of the well-known coal operators of Illinois and had spent years in the coal mining industry.

## Coming Meetings

**New York State Coal Merchants Association, Inc.**, 14th annual convention, Sept. 4-6, Stamford-In-the-Catskills, N. Y.; headquarters Churchill Hall. Executive secretary, G. W. F. Woodside, Arkay Building, Albany, N. Y.

**American Chemical Society.** Fall convention Sept. 8-11, 1924, at Ithaca, N. Y. Secretary Gas and Fuel Section, O. O. Malleis, the Koppers Co., Pittsburgh, Pa.

**Oklahoma Coal Operators' Association.** Annual meeting Sept. 11, 1924, McAlester, Okla. Secretary, A. C. Casey, McAlester, Okla.

**Association of Iron and Steel Electrical Engineers.** Annual meeting and exposition at Duquesne Garden, Pittsburgh, Pa., Sept. 15-20. Secretary, John F. Kelly, 1007 Empire Bldg., Pittsburgh, Pa.

**National Safety Council.** Thirteenth annual safety congress Sept. 29 to Oct. 3, Louisville, Ky. Managing director and secretary, W. H. Cameron, 168 No. Michigan Ave., Chicago, Ill.

**American Institute of Mining and Metallurgical Engineers.** Fall meeting, Birmingham, Ala., Oct. 13-15. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

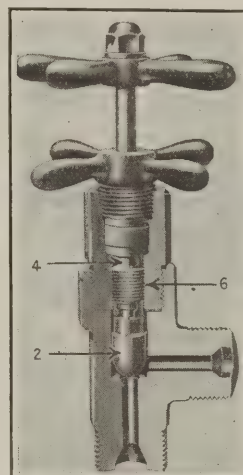
**American Institute of Electrical Engineers.** Fall convention, Pasadena, Calif., Oct. 13-17. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

## New Equipment

### Oxygen Manifold Has Valve That Cannot Blow Out

What is said to be an absolutely foolproof valve for oxygen manifolds has been devised by the Oxyweld Acetylene Co., of 30

East Forty-Second St., New York City. The body has a formed seat receiving the stem tip 2. This tip is attached to and carried by the stem 4, by means of a swivel joint. Thus, the tip is enabled to seek its own natural seat in the body. The stem screw is in the inner end of the stuffing box 6, which is made gas-tight into the body by means of a lead gasket. The stem itself is made



### Safe Manifold Head

Stem screws into stuffing box and so internal parts cannot be blown out by pressure.

Itself is made gas-tight by the rubber packing, which is compressed between packing rings by means of the handwheel and nut.

If the operator should happen to unscrew the handwheel all the way, there is no possibility of the internal part being blown out by pressure, because the stem screws into the stuffing box. Even if he should unscrew both the stem and the handwheel, the parts could not come out because the large end of the stem would lodge against the inner end of the stuffing box.

### Power Plant for Gassy Mines Moved Around on a Truck

The first approval of a portable electrical power plant for use in gaseous mines has been given by the Bureau of Mines, to the Mancha Storage Battery Locomotive Co. and covers a special truck of locomotive type containing battery cells of sufficient number and capacity to operate a coal-cutting machine.

One of the chief causes of electrical accidents in coal mines is sparking or arcing of electric wires. A wide application of the storage battery may be the solution of this problem by doing away with all permanent wiring in gaseous or dusty mines.

The advantages claimed for the portable power plant are that it permits the elimination of feeder circuits and that it gives more rapid and satisfactory operation of the mining machine, owing to uninterrupted power supply and non-fluctuating voltage.

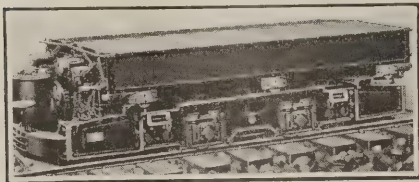
The power truck has a single motor connected to both axles by a worm and



gear. Its weight complete is from 10 to 12 tons. The battery equipment available differs for the various types which may be used.

An individual service plug and receptacle is provided for connection of the mining machine cable to the battery. The mining machine circuit is fused at the battery box with the same type of combination fuse and switch as is used for the main circuits of the truck. With this arrangement the power can be cut off from the mining machine either at the cable reel or at the battery. The service plug is locked in place by means of a padlock, and therefore the power truck and coal-cutting machine operate together as a unit.

The motor, controller, resistance, main fuse box, headlight, headlight



**Power Plant on Wheels**

Taking the power plant to the motors may seem to be a novel experiment to some of us, but in gaseous mines or places rapidly developing, much of this is done.

switch, headlight fuse box and ampere-hour meter housing, after having been subjected to rigid inspection and tests in explosive mixtures of Pittsburgh natural gas and air, were judged to conform to the requirements of Schedule 15 of the Bureau of Mines, which states the procedure for establishing a list of permissible storage-battery locomotives for use in gaseous mines.

Like the flame safety lamp or any other safety equipment, the power truck can be relied upon as being safe only so long as it is carefully inspected and maintained in a safe condition. The approval plate specifically mentions points to be observed in keeping the equipment in a permissible condition.

### Stoker for Small Boilers

Small coal mines have thus far not found stokers suited for use under their small boilers and accordingly usually have burned large coal wastefully and with heavy firing losses. Furthermore all industry has been similarly situated, also apartment houses which use boilers for heating.

The Stoker Sales Co., 650 Old Colony

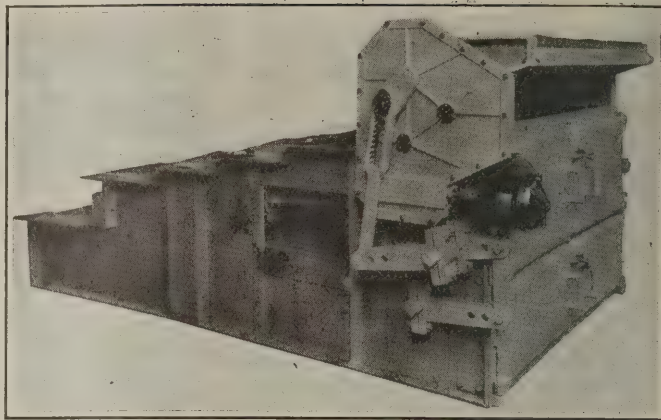
### To Burn Screenings Smokelessly

This stoker makes it easy to burn small sizes, saves loss of coal to ash pit, and heat losses in firing. It also makes the use of poor coal profitable.

Building, Chicago, has introduced a stoker, designed by Joseph Harrington, to burn screenings or any coal below the grade of No. 2 under a boiler, consume it smokelessly and transfer the ashes into a receiving hopper. This stoker, known as the King Coal, is constructed for boilers in sizes ranging from 250 hp. downward and is well suited for western screenings. It has a reciprocating plate carried on rollers which has a travel up to 5 in., the length of travel determining the quantity of the coal fed. The grates are terraced or stepped, the first set of grate bars resting and sliding over the second step of the grate. The first and third grates have a forward and backward sliding motion (their action being simultaneous) and the second and fourth grates are stationary. By this motion the grate bars literally slide out from under the coal, the bed of coal being disturbed only by its fall over the ends of the grate bars. Because of this action, even coal with coking properties can be burned and with an efficiency said to be equal to that obtained from non-coking coals.

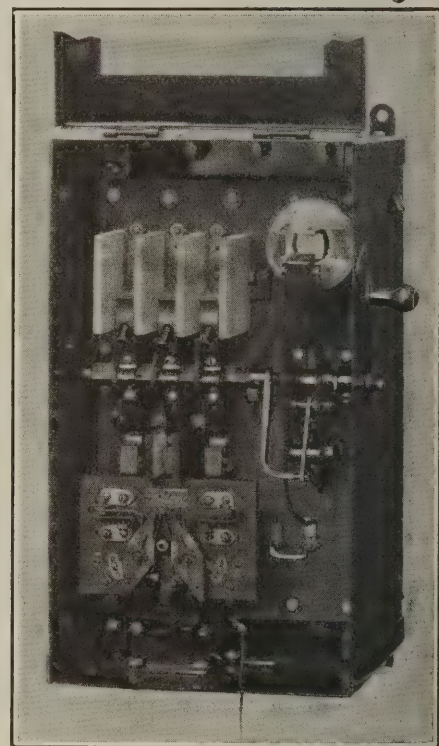
The plate or table directly under the ash opening at the rear supports the body of ash as it falls from the fourth grate. Having a reciprocating action it provides also a slow but definite travel of the ash toward the front, but as it at all times fills the throat or ash opening, that opening is always sealed against an inrush of cold air. By the use of this stoker most of the heat in the ash is utilized and complete combustion made possible.

Either natural or forced draft can be employed. The stoker is operated by a  $\frac{1}{2}$ -hp. motor or by a hydraulic drive of equivalent power.



### Starter for High Torque Duty

A new manually operated, inclosed type resistance starter suitable for starting squirrel-cage induction motors as large as 20 hp. on 550-volt circuits,



### Safe Inclosed Motor Starter

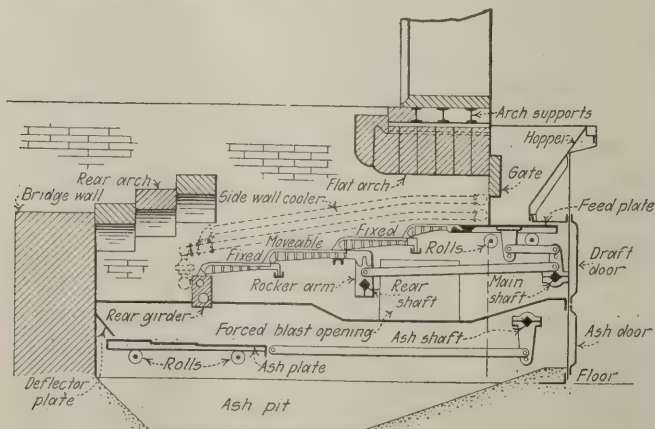
Being manually operated but inclosed, this new starter is suitable for use wherever inexperienced labor is employed. The overload trip may be reset without opening the cabinet by pulling a chain hanging from the bottom of the box.

### Coal Steadily Fed Forward

Second and fourth steps of grate are stationary; the ash step and first and third steps reciprocate. Grates slide out from under coal. Quarter horsepower motor drives grate.

has recently been developed. The resistance is proportioned to give an inrush current three and one-half times the normal full load motor current, thus permitting the motor to develop at least 50 per cent of its full load torque while starting.

The starter is made by the General Electric Co. and is of the safety type, completely inclosed with ventilated case, externally operated and provides overload and undervoltage protection. It is furnished with a single-step resistor, equal parts of which are connected in each phase. The switching elements are of the contact finger type, strong and readily renewable.





# COAL AGE

McGraw-Hill Company, Inc.  
James H. McGraw, *President*  
E. J. Mehren, *Vice-President*

Devoted to the Operating, Technical and Business  
Problems of the Coal-Mining Industry

R. Dawson Hall  
*Engineering Editor*

Volume 26

NEW YORK, AUGUST 28, 1924

Number 9

## Our Ventilation Notions

EUGENE McAULIFFE, as usual, looks ahead of his contemporaries. Our laws are based largely on non-gaseous conditions. They provide rules to keep our mines free from "noxious gases," the carbon dioxide and the unburnt gases of the long discarded oil-flame torch and from the gases from explosives burned and partly burned. Still the logic of making the quantity of air dependent on the number of men has some validity. Where there are more men, there are larger areas to ventilate and as more coal is broken, more gas is made.

However, the logic at best is bad. The better plan is to base the quantity on a fixed minimum per man with a requirement that the methane in the return be less than a given percentage. Today we can measure the percentage of methane and it should be determined, the ventilation being made dependent on it. Furthermore the air should be well distributed. Our anemometers are poor instruments at best in a sluggish current. If they had been better, we should have found mine inspectors long ago insisting on men receiving at their working places the minimum quantity required by law. Unfortunately, even now it is impossible for them to make any such demand. They could not measure the air even when it is supplied, so they are obliged to satisfy themselves by insisting that the air passing the last crosscut of an entry shall be enough to supply all the men working on that split, not a very satisfactory requirement, as we all know.

## We Have Skimmed the Cream

EUROPE builds for generations. It anticipates that it will continue mining seam after seam till all is mined, whereas we are merely skimming the cream. In most cases we have assumed that there is only one good and workable seam in a hill. Perhaps there is but one today, but there will be more tomorrow, for by the time one seam is exhausted, another, or more than one, has become valuable by reason of the general depletion of the thicker, cleaner measures available for operation.

In the anthracite region seven or eight seams, one above the other, are being mined. In the Connellsville region the Pittsburgh seam is becoming exhausted and the Sewickley is being attacked. In the Georges Creek field the Big, or Pittsburgh, bed has had its day, and the Tyson, or Sewickley, thin as it is, is being mined. In the Clearfield region, the Moshannon, or "D," bed has almost disappeared and mining in the Lower Kittanning bed and other seams has followed. These are a few examples but there are many others.

Why not build like Europe, as far as houses are concerned—for generations? We believe that practice will become general as the cost of lumber increases and

deeper—and therefore more extended—beds are attacked. The miners, in America, live in frame houses and own automobiles. In Belgium they live in well-designed residences and own bicycles. Someday, perhaps we shall be somewhat like-minded, and better housing will be customary.

However,—and here we hedge—as our rate of extraction is speeded we probably shall continue to face the difficulties that are part of such rapid extraction. Our villages cannot be permanent, if a few short years end their usefulness.

## "It Can't Help It"

AFTER outlining a new scheme to the superintendent or manager for effecting a saving in operation or maintenance, the electrical or mechanical man is asked, "How do you know it will work?" Characteristic replies are, "Well, it looks like it ought to," and "It can't help it."

Is it difficult to guess which reply is from the "cut and try" man, and which is from the man who has made a careful study of his line of work? The fast-passing "Let's try it" type may become a fairly valuable man if he lives long enough and is fortunate enough to be able to continue performing costly experiments at the company's expense.

Today we must reduce labor costs; this requires the use of more and newer types of machinery. The cost to own and maintain this equipment tends to offset the labor saving. How can the margin be increased? Putting the supervision of the mechanical and electrical equipment into the hands of a man who has the required training and experience may be the solution. At times of low profit costly mistakes are unusually distressing.

## The Private Police Nuisance

PRIVATE police we are told are an anomaly not contemplated by the fathers of our country. Whether that is true or not, the private hiring of police is not desirable and is comparable to employment of retainers on feudal estates. To each baron was left the task of keeping order, and he did it by maintaining armed men in or adjacent to his castle.

It was not a happy way of solving the situation. With the passage of time it was ended. The state became strong, it provided its own guards, and the law was better maintained. We condemn feudalism, but it was better than disorder. It was the only hope in those disorderly times. Where the state is strong and vigilant there is little need for feudal retainers or armed guards.

When the rulers are prompt to enforce the law and repel disorder the land owner does not look for any other assistance unless he is desirous of subverting the law. But where governors are mere puppets of the



electorate, when their main concern is to keep not their oaths but their votes or the votes of the party, private police are almost inevitable.

The duty of the state is to maintain order and not to mend it after it is broken and the damage is done. If this is not the law it should be or we shall drift into feudalism insensibly. Even now in banks we have armed detectives and armed employees. We have our armored cars and armed men traveling the streets on behalf of banks as well as on behalf of the U. S. government.

At the mines also we sometimes have armed guards. It is distinctly unfortunate, but usually in such cases the state is weak, venal or penurious, and the people suffer. The fault is with the state. The crime is that of the politicians, no matter how diligently they may try to place it elsewhere. If we have feudal weakness at government centers we shall have feudal conditions throughout the country. Feudalism was the outward sign of a disease known as defective nationhood.

### Talking Through the Ground

THERE are men in the coal industry who scoff at the news that an Illinois high school teacher and a bunch of his boys have perfected radio equipment and a circuit by which telephonic communication can be set up between a mine and the surface. They say: "What's the use of it, even if it does work experimentally? There would only be a one-in-a-million chance that miners caught in a blast could get to one of the underground radio telephone sets, and even if they did, it wouldn't do much good, for relief parties can do a good job of locating imprisoned miners as it is."

This is somewhat idle talk. It is a well known fact that relief parties cannot always locate imprisoned men easily. In fact they often cannot locate them until they are all dead. If Mr. McCall and his boys—and girls; for there are four in the Springfield High School Radio Club—have made it possible for men on the surface to talk straight down through the ground to points in a mine directly beneath their feet, something beneficial has been done for mine rescue work. Let there be no mistake about that.

Even if miners in an explosion had only one chance in a million to get into a radio-equipped refuge chamber, still the device would be worth while, for a human life is precious. But the chances would normally be a great deal better than one in a million. And what would be the cost of properly equipping a mine? This cannot be said definitely. Permanent installation and maintenance would add something, but whatever the cost, it probably would be modest in comparison with the value of lives of men. So if these Springfield boys actually have done something constructive, let their elders in coal mining recognize it. In fooling with radio, the boy is always likely to do the thing a man thinks is impossible.

Nearly every invention starts hampered by limitations that make it of doubtful utility. But the step once taken, experiment follows and the limitations are one by one lessened or removed. "What use is it?" is not the appropriate question, but rather, "Of what uses may it be as conditions change and limitations are removed?"

### Law and Sentiment

NO ONE CAN fail to appreciate that a right sentiment, as regards safety, is better than stringent regulation, but, unfortunately, the right point of view fares but badly in face of fierce competition. With prices as low as those now existing there is sure to be a tendency toward short cuts, the operator hoping that somehow the accidents which go with economies in management and method will somehow escape him. Sometimes he does escape them for months, even years, and then the fatal moment comes and he finds that he must pay the penalty of his evasions.

The Rocky Mountain Coal Mining Institute's safety committee, the report of which we publish today, lays stress on the possibilities of a sentiment created for safety, and the West has always shown an excellent spirit in this matter. It has for years regarded the laws as minimum provisions for safety and sought a more excellent maximum. That it has not attained safety has been due to the fact that the state of the mining art did not afford methods sufficiently safe to meet the unusual dangers of Western mines.

The failure of the West to avoid severe explosions has been due not to law breaking but to lack of knowledge of the way in which to avoid explosions. That lack of information was nation-wide and particularly distressing in the West because nearly all the problems presented themselves in their most acute form. In justice to the West, it must be said it has been disposed always to lead in safety methods, to devise new safety plans, to use its brains to anticipate trouble, but with all its effort, originality and willingness to engage technical graduates, it has not been able to keep its mines as safe as those in the East, due to the inherent dangers of the coal on the Rocky Mountain slopes.

But, however much we may approve the spirit of the West in general and that of the Rocky Mountain Coal Mining Institute in particular, we cannot endorse its sentiment toward the law. We want more and better laws, we should advocate them and not merely take an indifferent attitude to them. With the sentiment toward good practice, laws to enforce correct action on the few unwilling should make for better mines. The laws are antiquated, sometimes positively harmful unless disregarded, and they should be made more in accord with modern knowledge and practice and also more stringent. There are too many lawyers, doctors, butchers, and bakers, who do not know anything about mining, who own and control mines. There are too many catch-penny mine owners. The industry needs laws to control them and to quote to them. The better operators have to compete with these ill-instructed or ill-meaning men and desire that they shall have to meet the same bills for safety as other operators.

The other day the telephone bell rang. An operator at the other end of the line wanted to know if there was any law to prevent him from drawing the pillars on his main entry; the coal looked near and easy to mine. He was assured that there was no such law, but that he had better beware of any such practice or he would have no mine. This is an extreme case but with such men we need law, not, perhaps, to prevent that particular action, but to keep them from doing others not so obviously foolish but more harmful to the workman and to their business rivals.





Office and Bathhouse at the André Dumont Colliery

## Campine Mining Villages Resemble Garden Cities

Equipment Provided the Mines Without Stint—Koepe System of Hoisting Used—Permanent Materials of Construction Employed—Towns Artistically Designed by Skillful Architects—House Interiors Immaculate

BY D. ADAM  
London, England

UNUSUALLY liberal has been the equipment of the collieries in the Campine district of north-eastern Belgium. Modern machinery and appliances are housed in palatial buildings that have nothing of the cramped and crowded architecture characteristic of the older collieries. The streets and lanes of the upper works have given way to the "grands boulevards," where there is neither congestion of traffic nor accumulations of stores or materials. The engineer coming from the narrow galleries of the mine may be inclined to think that his brethren on the surface have run riot in the abundance of space that has been afforded them, but closer examination will satisfy him that all has been planned to lighten the labors of those below ground, whose working space is limited by a roof and floor little more than two ft. apart.

The workshops are designed to make the collieries, as far as possible, independent of outside engineering assistance. Not only has provision been made for all normal repair work, but for the manufacture of such equipment as mine cars, cages and small pumps. At the André Dumont colliery it is even proposed to install an electric furnace for making steel castings.

At nearly all the collieries, pulverized coal is to be used for boiler firing. It is estimated that this will save 25 to 30 per cent in fuel consumption. The Lim-

bourg-Meuse colliery has already two boilers equipped for burning powdered coal, and the results so far obtained have been highly satisfactory. A pulverizing and distributing plant is now under construction at Winterslag for supplying a battery of fourteen boilers.

### CAMPINE SHAFTS USE KOEPE HOISTING SYSTEM

One feature that specially strikes the visitor to these Campine shafts is the use of the Koepe hoisting system. This system is not much in favor with engineers outside Belgium and Germany, but in these countries it is strongly advocated for deep shafts, even those equipped with four-deck cages carrying eight cars of 600 kilos (1,323 lb.) capacity. One reason given for its adoption is that the coal is hoisted from different levels in the shaft and for such work the cylindro-conical drum is not suited.

In nearly every case when the production stage has been reached, electric hoisting engines are employed. Both underground and on the surface arrangements are made for the simultaneous loading of at least two of the cage decks. The shafts, as previously mentioned, are equipped with four hoisting compartments, and this also has been a factor influencing the choice of the Koepe system, for the space occupied by the engine and pulley is far less than that taken up by drums. The engines also can be placed alongside one another without excessive "angling" of the hoisting rope. The collieries generate their own electric power and are fitted with magnificently equipped central plants feeding the surface works and underground substations.

The baths provided for the miners are so luxurious, with their individual tiled compartments and showers, that their attraction must be irresistible even to those

NOTE—The André Dumont colliery shown in the headpiece is one of the newest in the Campine region although none are old in any sense. The employees enter the operation by way of the large doorway toward the right of the illustration. Surface workers may go direct to their respective places but the underground employees go to the shafts by way of the washhouse and bathroom. At the "inquiry windows" in the large hall the workman can get in touch with any department or receive instructions for the day's work.

Some of the Geological features and operating characteristics of the Campine field were described in the issue of Aug. 21 pp. 247-251.





FIG. 1

### Miner's Houses, Winterslag

Materials for permanent construction are abundant in this locality. Thus good stone for foundations, sand and gravel for making concrete, and clay for brick and tile manufacture may be found in the immediate proximity of the mines. As a result these materials are used freely in construction. Houses like these are not only neat and attractive but durable and the upkeep is almost negligible.

most firmly addicted to the family tub. A salutary Belgian law requires mine owners to provide change houses and baths for the miners, but it cannot compel the miners to use them. Some moral persuasion may be used, but it is rarely needed. The Belgian miner accepts the bath with thankfulness and would not tolerate the conditions common in British operations, where the miners, wet and dirty from their day's work, often have to travel long distances by train or trolley to their own and their fellow-passengers' discomfort. British tourists with the virtuous feeling engendered by their own devotion to the "morning tub," formerly spoke reproachfully of their Continental neighbors' neglect in this important matter, but, so far as the mining industry is concerned, the reproach is now all the other way.

The tourist inclined to adopt airs of superiority will learn another lesson in the Campine, perhaps still more humbling. The housing of the mine employees in this region is a model to the whole world, and a revelation to those familiar with the rows of squalid dwellings that surround the old-time colliery. Apparently, in former times, it was considered that the miner would be out of his element if the dirt and discomfort with which he was surrounded during his working hours were lacking in his hours of leisure. Another grave error of those days was to suppose that miners' houses could

be designed by an engineering draftsman, on the simple principle of drawing with straight edge and tee square a row of rectangles for the ground plan and another series of rectangles, with smaller rectangles inserted, for the front elevation.

The first plans for the garden cities of the Campine were made by engineering draftsmen it is true, and the inevitable rows of rectangles made their appearance. The land available—and there was plenty of it—was divided into squares and as each of these was a duplicate of the others, one detailed plan multiplied by blue printing served the needs of the building contractors. Fortunately wiser counsel prevailed, and architects were summoned. These men with greater skill and a finer artistic sense, designed the beautiful communities that today are springing up on the old waste moorlands of the Campine.

### WINTERSLAG MAKES SANDY SOIL PRODUCE

Winterslag already has a population of more than 4,000. A church is under construction as well as a school, eight hotels for bachelor employees, numerous cafés and canteens and the indispensable cinema or "movie." The sandy soil has been made fertile by dint of hard work and every house has its flower garden. The broad avenues and boulevards, laid out on graceful curves, are lined with trees and at every step there is something to attract and please the eye. It may be nothing more than a variation in a doorway or gable, or the style of architecture may be completely changed, but always the effect has been thought out and in every line there is evidence of the artist's hand.

Perhaps the cost was a little more than that of standardized rectangles, but so little more that no one with even the slightest perception of architectural beauty would give it a thought. One thing has helped the architect to obtain variety. Belgium is a democratic country and in her new-built cities of the Campine there are no Fifth Avenues or Park Lanes. The villas of the higher officials are, of course, more commodious and elegant than the miners' houses, but they are not set apart in some exclusive quarter for the aristocracy. On the contrary they are scattered here and there throughout the whole city and in the matter of postal address there is no invidious distinction between one street and another.

Inside the houses, the architect has been no less



Fig. 2—A Miner's Garden, Once a Sandy Waste

This "old world" garden located in the town of Winterslag, shows what can be accomplished in the way of transforming the sandy moors from a stretch of waste land into an attractive home. Intelligence, water, work and fertilizer did the trick.





FIG. 3

### Hotel du Parc, Winterslag

Several hotels such as this have been constructed. Here the single men of the mines can board for about 8 fr. per day. This is equivalent to approximately \$1.60 in our money at normal rate of exchange or about 40c. per day at the present exchange rate. A small and homelike hostelry is the Hotel du Parc. The Belgians believe that a house without a garden is a shed and not a home.

successful in his treatment, and Belgian housewives, famous for their spotless polished kitchens, are delighted with the opportunities afforded for the practice of their art. The husband who ventures to omit the change house and the bath on his homeward journey from the mine receives persuasion far more effective than any, moral or otherwise, that could be given him by the mine authorities. The accommodation in the houses is varied to suit different requirements. Large families are not unfashionable in the Campine, and generous provision has been made to house the young generation both in the homes and in the schools.

The colliery companies are building these cities with their own workmen. With a certain degree of assistance from the state in the form of loans at a low rate of interest, they have been able to build at a lower price than would have been possible had they employed an outside contractor. They were fortunate in finding close to the sites of their towns good sand and gravel for concrete, and clay for brick making. The provincial and local governments are contributing toward road building and drainage. Railway construction to meet the needs of this new industrial center is being provided by the Belgian State Railways.

To some, the expenditure entailed in building these garden cities may seem extravagant, more especially as the mines have not yet reached the stage of full produc-

tion. The mental inclination of the Belgian workman must be taken into consideration, however, before just judgment can be passed. He is not an individual of the pioneering type, prepared to "rough it" in the wooden shanties of the traditional mining camp. Furthermore, work is not so scarce in Belgium that he need deprive himself of home comforts in order to earn his living. Consequently it was essential at the outset to attract labor by providing home attractions on a liberal scale. The Campine, before its transformation, had nothing to offer. To artists in search of the picturesque and to the sportsman with his gun it doubtless held many attractions, but the miner after his days' work demands diversion of another kind.

No doubt recruits from other countries could have been obtained on easier terms, but the colliery directors are anxious to employ as large a proportion as possible of Belgian workmen and to exclude especially the vagrant here-today-and-gone-tomorrow type. About 16 per cent of the miners in the Campine are foreigners, chiefly Poles, Czechoslovakians and Italians. This proportion is likely to increase with the growing labor demands of the mines. The Flemish population of the Limburg province is more inclined to farming than to mining, and the annual influx from the southern coal-field will hardly be sufficient to meet requirements.

But there is a younger generation that in time will

FIG. 4

### Street Scene, Winterslag

Broad, gracefully curved streets and avenues, bordered with trees and artistically lighted are characteristic of these mining towns. To such communities as these with permanent abodes the term often applied of late years to the settlements of a similar nature in this country, namely, "a mining camp" is a misnomer.







FIG. 5

**A Villa**

This picture shows a villa of a mine official, the home of a mining engineer, yet this building, as well as others of its kind is not set apart in some aristocratic secluded neighborhood but is placed among, and flanked upon either side by, the homes of miners. This is characteristic of Belgian mining towns.

inherit the land and supply all the labor that is necessary. As one of the engineers remarked with a wave of his hand over the extensive construction work in progress, "It is for the next generation we are building all this." It is to be hoped they will appreciate the enterprise and the foresight of the engineers who are working in the field today and laying such solid foundations for the benefit of those who are in future years to follow after them.

One word must be added in acknowledgement of the courtesy shown to the visitor by the mine managers and engineers of the Campine. To one of their own craft they are generous with their time and do not permit him to feel that he is trespassing upon it, nor to depart with any other impression than admiration of the engineering skill embodied in these colliery shafts and works, and pleasure in the hospitality which has enabled him to visit them.

## The Miner's Torch

### The Wife of the Boss Man

**C**HANGING conditions bring on new problems; sometimes these new problems are almost old problems before we realize their existence.

Automobiles have been in pretty general use around our mining camps now for about ten years. Fifteen years ago there might have been found an occasional auto in a mining camp, but generally speaking at that date an auto was almost a novelty to the average mining village. Five years later almost any camp with passable roads leading to nearby villages had fleets of them. The changes brought about in our home and family life during these ten years have been momentous and far-reaching but we are only just beginning to appreciate them. About ten years ago the son of one of my college chums was promoted from mining engineer to mine superintendent, and a few months later decided that his future was promising enough to justify matrimony. I should have said that he decided to embark on the "sea of matrimony" because that word picture describes his adventure so well; their little craft encountered many a terrifying storm and the end is not yet, although the last storms encountered have been mild.

Five years ago I learned of a similar case. A few months ago I learned of another. Back in the days when I was a newly wed newish superintendent I was acquainted with a number of young men who belonged in my classification, and neither I nor any of them ever were troubled with the terrifying storms encountered by these sons of my friends, so when I heard of the last adventure mentioned I decided to make a little investigation.

I found that most of the young mine superintendents

of the present day who have passed from college to engineering jobs and then up to superintendent's desks have gone back to the cities (just as they did in my day) in search of their former sweethearts for wives, and while these young superintendents have had little love for the cities after marriage their brides are not similarly inclined. The automobile makes it possible for brides to keep in touch with city acquaintances and trips can be made back and forth without benefit of husbands and if necessary even without their knowledge.

Young superintendents have many duties and interests at the mines but the young wives are not so fortunate; whenever time begins to drag wives are apt to recall that an automobile is standing idle and then things begin to happen.

Back in my young days wives may have found time hanging heavy on their hands but they had to grin and bear it, at least that is what they did do. Blame the automobile? No! Blame the fathers who have censured the son's wives without realizing that times have changed.

### Resistance of Entry to Air

The results of a study of the resistance of coal-mine entries to the flow of air, made by Interior Department investigators at the experimental mine of the Bureau of Mines near Pittsburgh, Pa., are given in Serial 2621, recently issued. The Bureau of Mines initiated an extensive research on coal-mine ventilation factors in 1922, large-scale tests being conducted in its experimental mine over a period of two years. A comprehensive report on this work is in course of preparation but the present report is only the first of a series and considers only entries in which there are no obstructions other than the natural roughness of the ribs, roof, and floor. In order to place the practical results before the mining fraternity immediately and in condensed form, the more important features of the investigation will be presented in a number of short papers.



# Too Much Guess Work in Mining to Suit McAuliffe

Head of Union Pacific Coal Co. Appeals for More Accurate Knowledge—Objects to Common Plan of Ventilating on Basis of Input per Man Without Proof That Air Does Its Full Job

PERHAPS the most apt criticism that is now being made of the coal industry is that, to an extent, possibly exceeding any other industry of similar magnitude and importance, it depends for its conduct altogether too much on "rule of thumb" and "tradition," rather than on proven practice and actual fact. There are yet too many chances taken—we are still "weighing pounds on railroad track scales" and measuring yards with the proverbial "bit of string." The actual expense of conducting any one of the several operations incident to the production of coal is rarely determined, and in many instances the general cost figures, prepared some weeks after the work is complete, are of such a sweeping character that little can be abstracted therefrom. Many coal companies are now making a daily cost sheet, showing the cost of labor and material in detail, as used in the several related operations. This is quite helpful, particularly to the mine superintendent and his foreman, who, without it, sail an uncharted sea. The auditor's belated monthly summaries are rarely ever seen by these men who are held responsible for the labor and material used. I have made reference to this situation to accentuate the fact that the coal industry contains more "serious-minded, conscientious guessers" than does any other similar industry, although the annual cost of our product runs up well beyond the billion-dollar mark.

Now this brings me to the question of safety, the one question that should be, and which is, I know, uppermost in your minds. The coal-mining world, engineering and operating, is now well "sold" on at least two things—the theory of using permissible explosives and the elimination of the open light. Furthermore, the industry, particularly that portion which is located in the United States and Canada, is now planning vast extensions of the use of rock or shale dust, both in the form of dust barriers and in direct application to entries and crosscuts.

This is well. However, my study of past mine explosions has convinced me that the great majority of such blasts had their beginning in gas accumulations; frequently originating in restricted areas at the working face, in abandoned worked-out areas, or in some other place where ventilation is not maintained as it should be. And that again leads me to the point where it can again be well said, that there is too much rule of thumb, too much guessing now being done in regard to the volume of air required and continuously furnished, in a given entry, panel, room or area.

Just to emphasize this situation, is it not a fact that the majority of mine inspectors express the ventilation conditions as measured by them, in terms of cu.ft. per man employed, in each certain split, and do not the mining laws of many states yet demand a minimum of 100 or 150 cu.ft. per man, and 500 cu.ft. per minute for each mule, which is even worse than guessing distance?

By what process of reasoning can the relative freedom from gas in a given area be determined by the number of men employed? Five thousand cu.ft. of air, with one man employed, gives 5,000 cu.ft. per man. If 50 men are employed the result is 100 cu.ft. per man, the lawful minimum in certain states. This sounds insufficient but, as a matter of fact, the circulation created by the activities of 50 men adds to safety. This formula is a hoary survivor of the now obsolete, smoky, air-defiling oil lamp.

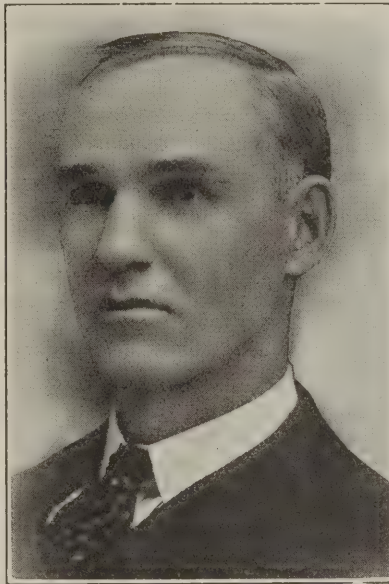
Again examine the average state mine inspector's annual report. You will find therein frequent reference to the size, type and drive of the fan used at a given mine and the cu.ft. of air handled, with water gage shown. However, the real question is, Does air reach every portion of the mine, does it scour the fresh working face and the shifting top in the pillar-drawing area, or does it, finding the line of least resistance, bypass through leaky stoppings, the circulation growing weaker, weaker, weaker, as it approaches the real gas-making territory?

Do you know you have air at the face? Have you a ventilation map of your mines, and do you get a regular and definite record of air at the face, or do you still use the rule of thumb?

Perhaps a simple illustration of what mine ventilation really means will be impressive. Take, for example, a mine producing 250,000 tons of coal annually, the average input of the mine fan 100,000 cu.ft. per minute, or 52,560,000,000 cu.ft. per year. We will disregard water gage, relative humidity and other factors in our calculations, dealing with weight alone.

The mean weight of air at temperatures ranging from zero to 95 deg. F. approximates 0.0774 lb. per cu.ft., therefore the weight of air forced through this given mine in a year totals 2,034,072 tons, equal to 8.14 tons of air to each ton of coal hoisted.

Perhaps a simple computation of the volume of explosive gas (methane or  $\text{CH}_4$ ), that is generated in an average mine may be equally illuminating. Let us assume the measure of air input given in the foregoing example, where the fan handles 100,000 cu.ft. of air per minute, equivalent to 144,000,000 cu.ft. in each 24 hours. Again assuming an analysis of the return air shows a gas content of one per cent, we find that



Eugene McAuliffe

NOTE—From a paper read by Eugene McAuliffe, president Union Pacific Coal Co., before the summer meeting of the Rocky Mountain Coal Mining Institute, Rock Springs, Wyo., Aug. 8.



1,440,000 cu.ft. of gas is generated in the mine daily, a volume equal to the capacity of 450 standard 40-ft. railroad box cars, filled to the roof. As methane weighs approximately 0.0451 lb. per cu.ft., the day's outpouring of gas would weigh 32.47 tons.

You will bear in mind that this volume of gas is harmless when diluted in the proportion of one to ninety-nine, but as gas weighs only about 55 per cent of the weight of air its disposition is to rise to the top, unless the scouring action of an adequate ventilation current sweeps it out of the places where it tends to gather, reducing it by diffusion to a harmless quantity. The foregoing presentation of the magnitude of the ventilation problem may or may not be useful to you; doubtless many of you have properly weighed the job in times past. It might be well to size it up anew.

Certain of our friends, whose mines are located in districts where much water must be handled, stress the millions of ft.-lb. of energy required to keep their mines dry. Keeping them aired is an even greater and more important problem; you see the water, it asserts its presence when neglected, but air, or lack of air, is a more insidious, secretive enemy; it hides its fangs until the moment comes to strike and then it strikes hard.

All mine foremen know what bad track, poorly maintained, without proper surface and alignment, short turnouts, etc., means to their haulage. By it the mine operations are slowed down, the output decreases, costs run up. So it is with air, it also requires a proper traveling way; one reasonably free from short curves, abrupt elbows, falls or other restrictions.

Again, the airway is a pipe, it must be tight or the contents will leak away before it reaches its destination. There is much in common between the natural laws that govern the movement of mine cars, of water in pipes and of air, through air courses. These laws are simple, but they are immutable; ignore them, neglect them, and you pay the price.

Reverting to the question of rock dusting: we propose to complete a most extensive program in our Wyoming mines, one which has been under way for some months, but our men are, I hope, all sold to the theory of air, air at the face, the whole face, and that continuously for each of the twenty-four hours in the day.

That means a dependent fan drive, automatic restarters on fan motors where electrically driven; it means adequate aircourses, kept clean; tight stoppings with overcasts instead of doors, and an ever vigilant policeman in the form of a recording water-pressure gage on every fan, with a positive inspection of the fan chart by the mine manager before the man trip is allowed to enter the mine each morning, and that regardless of the number of gas men employed or the fact that they have just reported, "Mine clear." These charts thereafter are scrutinized by the resident mine superintendent, the general manager, the general superintendent and the safety engineer.

In conclusion, I have two broad appeals to make. One is for the education, development and encouragement of the underground mine supervisory forces who stand nearest to safety and economical operation. These men deserve more encouragement and help than is now given them; many of them need to be shown how to help themselves.

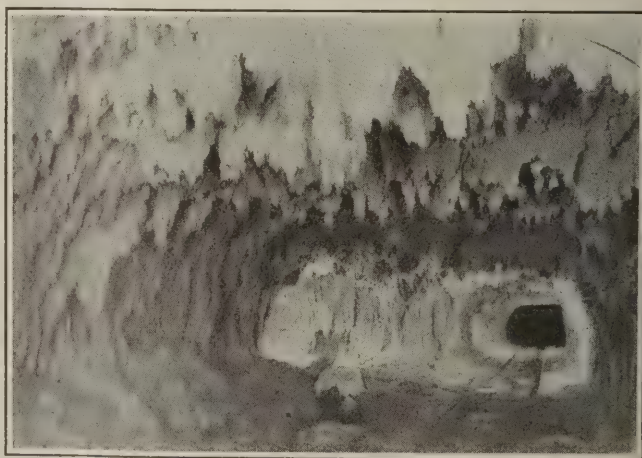
My second appeal is directed toward a better relationship with the working force. We take too much for granted there. The great majority of men wish to and will do the fair thing, but perhaps they are not met half way by the employers.

The coal industry has for too long been the football of a careless, speculatively inclined attitude of mind. It is a great, vital, pulsating industry, where nature and man should combine to get better results. The industry's digestive tract is now being taxed to assimilate the excess mines and man power taken in during the frenzied war and post-war period. It has suffered from too much hysteria on the part of both capital and labor in the past. A permanent sense of composure will prove a Godsend to those who depend upon it for fuel; to the men employed within it, and I might also add, to the wives and families of the mine workers, who have in the past taken too much punishment.

The extension of the theory of local chapters of this and similar institutes, with frequent meetings, every man employed invited and urged to attend and to take part, will definitely help toward the solution of the problems that now beset the industry and its people. They will help coal-mining men to *know* their work. The poet Tennyson said, "Better fifty years of Europe than a cycle of Cathay." Let our motto be, "Better one proven fact than a dozen guesses."

### GAS BY THE CARLOAD

**EUGENE McAULIFFE**, with his well-known faculty of making ideas stick in men's minds, figures out that in a coal mine producing 250,000 tons a year and with an input of 100,000 cu.ft. of air per minute, the fans drive in 8.14 tons of air for every ton of coal hoisted. If this makes one per cent of gas in the return air, there would be 1,440,000 cu.ft. of gas removed from the mine in 24 hours. This is a volume equal to the capacity of 450 standard 40-ft. box cars. With thoughts like this in mind perhaps the average mine operator will better realize how important it is that his mine ventilation be complete and that he should know the air is doing its work and not merely *guess* at it.



Who Says There is No Beauty in a Coal Mine?

These "stalactites" and "stalagmites" appear each winter in the main slope of the mine at Scofield, Utah, formerly operated by the Union Pacific Coal Co. These manifestations of winter can be seen also in eastern mines. They constitute one of the difficulties of the mine superintendent. But rarely is the scene so picturesque as this.



# Rocky Mountain Institute Lays Down Safety Code

Coal-Mining Authorities of Colorado, New Mexico, Utah and Wyoming Believe in More Observance Rather Than in More Law—Declare for Rock Dusting and Sprinkling—Want Constant Educational Campaign

**T**O DO ITS BIT for coal-mine safety, the Rocky Mountain Coal Mining Institute, at its Rock Springs, Wyo., meeting, Aug. 7-9, adopted unanimously a long safety report over which the Institute's safety committee had been working for a year. The committee, which consisted of G. B. Pryde, W. Littlejohn, D. Harrington, W. W. Risdon, J. Dalrymple, Glen Knox and P. F. Patterson, recognized that conditions vary from region to region and that therefore it is not possible to lay down one set of iron-clad rules. However, the committee declared for rock dusting and sprinkling in mines where there is both fine coal dust and methane.

The Institute believes there is less need for more state safety legislation than there is for closer observance of existing law. "Betterment of safety conditions in coal mines cannot be materially improved by extraneous influence or intervention," says the report, "but must come from within the industry itself by those who are familiar with its conditions."

"We believe," reads the report, "that the propagation of safer practices in coal mining work will not be accomplished by laws if there is not the will nor the desire to obey them, but must ultimately be accomplished through education of the officials and the employees. The underground officials and particularly the mine foremen, on whom so much depends in coal mining, must be educated to recognize their responsibility and opportunity to spread the gospel of safety among the employees."

"The very fact that the mine foreman has been certified by the state as one capable of managing a mine and taking care of the safety of the employees under his charge should make him sensible of his responsibility and develop in him habits of patience, courtesy and persistency in all his relations with employees under his charge, and it will also be necessary to teach the employees that these rules and regulations are not designed to harass or circumscribe them in their daily work but have been developed for their safety and protection and for their personal welfare. When this has been accomplished a better understanding will have been reached and we may then look for a reduction in the accidents in and around coal mines. The following rules and regulations are submitted for your consideration and approval:

"(1) The mine foreman or someone who is in direct supervision of the workings should see that timbers

are set properly and that dangerous places are made safe. Such places should not be left until the employee has been properly instructed how to take care of them.

"(2) There should be a closer inspection and patrol of working places, to prevent accidents from falls of coal and rock.

"(3) On all main haulageways a space of at least 30 in. should be left between rib and track, or timber and track, and in all rooms not less than 2 ft. should be left between the track and upright timbers.

"(4) Each mine should adopt a definite system of timbering of haulageways and working places, applicable to its particular conditions or seam.

"(5) Seeing that many accidents are caused by cars running away in rooms where "wild catting," McGinty or snubbing ropes are used and that this can be overcome by the panel method of working pitching beds, which eliminates the handling of cars by the miner on these grades, all rooms should parallel the strike and not the pitch.

"(6) Shooting off the solid should be abolished wherever possible.

"(7) Black powder should not be used in any mine where coal is undercut, overcut or sheared.

"(8) When practicable no shots should be fired when any men are in the mine. This can be avoided by electrical shooting from the surface. In any event, no shots should be fired until all persons except designated shotfirers have left the mine.

"(9) Shotfirers should be highly paid, experienced, conservative men, should have plenty of time to do their work well, should have a thorough knowledge of explosives, of gas, of dust, and of electricity, and should be required to have a certificate of competency after passing an examination covering these subjects, the certificates expiring at least every five years and being renewable only upon passing another examination.

"(10) All mines showing gas in any quantities should be termed gaseous mines, and approved electric safety lamps should be used in them.

"(11) Shotfirers should see that all shots are properly placed, and should have authority to reject all holes that in their judgment are misplaced. Your committee would recommend the encouragement of a system of drilling, tamping and shooting of all holes, by competent shotfirers.

"(12) Wherever water is available, sprinkling lines

## ELECTRIC ARCS DANGEROUS ANYWHERE

**T**OO few people seem to realize the dangers of electric arcs in coal mines, the Rocky Mountain Coal Mining Institute believes. In its safety report, adopted at Rock Springs, it holds that all possible precaution should be taken against such flashes in mines both gaseous and non-gaseous. It was reported that two recent explosions occurred from electricity arcing into dust on main intake air courses, and that methane had practically no part in the resultant blasts which killed more than 200 men. In an outdoor demonstration at the time of the institute meeting the Bureau of Mines showed how likely transformers are to flash over when overheated, thus driving home the need for fireproof enclosures for all transformers underground.



should be installed and machine cuttings thoroughly wetted down. When practicable cutting machines should be equipped with water sprays on the entering side of the cutter chain. This is the safest way known to render dust inexplusive. When not possible to use water on cutter bars, it is essential that all machine cuttings be loaded out before shooting the working faces.

"(13) Mining machines should be used wherever possible as they have a tendency to decrease both major and minor accidents.

"(14) Employees should wear heavy shoes with a good stiff sole, as many accidents happen from the wearing of light shoes.

"(15) As many head injuries occur in mines, heavier caps should be worn; stiff fiber caps have been found to make excellent substitutes for the present caps worn by miners.

"(16) Whenever it is necessary to do so, trolley wires wherever men are working ought to be protected by two strips of wood, old hose, or canvas securely clamped to the wire. Accidents frequently happen from the neck or back of the head coming in contact with a live wire when repairs are being made near these wires. To prevent this, a piece of rubber or other nonconducting material should be fastened to the cap and extend to the shoulders. This should be detachable and worn only when the man is engaged in a hazardous occupation of the kind described.

"(17) Though dust alone furnishes the starting material for probably less than 20 per cent of our coal-mine explosions, it propagates nearly all of them and is probably responsible for much more than two-thirds of the loss of life.

"(18) Open lights have been the igniting cause of well over 50 per cent of our explosions; methane generally being the fuel, though under certain conditions coal dust can be ignited by the flame of a carbide lamp. Gaseous mines should be equipped with approved types of electric cap lamps.

"(19) Flame safety lamps, chiefly in the hands of firebosses or safety men, have caused several explosions with heavy loss of life; usually the lamps have been improperly assembled or otherwise have been misused. Before lamps are distributed they should be carefully inspected by a competent man. All lamps should bear the approval of the U. S. Bureau of Mines and should be magnetically locked before being issued.

"(20) All electric lines should be properly constructed and supported. Sectional circuit breakers should be installed every 2,000 ft.

"(21) Mine fires have been the source of several explosions, usually through interruption or reversal of ventilation and passage of methane into the fire region; consequently open lights should never be used in fighting mine fires.

"(22) As methane starts most of our explosions, all available precaution should be taken against its accumulation, a few being mentioned herewith:

"(A) Every mine should have mechanical ventilation, and if the mine is distinctly gaseous and employs any large number of men, it should have two fans or at least two distinct sources of power for driving the fan.

"(B) Mine fans should be operated 24 hours each day especially if the mine 'makes' gas.

"(C) Stoppings should be of tight and of durable material.

"(D) Where gas is generated at the working face, line brattices should be used from the last crosscut to the face.

"(E) Every large mine should have more than one air split; each split should be absolutely separate from all others, and each should have adequate volume of air to supply enough circulation at the faces to remove methane as it is emitted.

"(F) The mine should be ventilated without the use of many doors, and the doors necessary should be in pairs with an air lock between. They should be solid, tight and equipped to close automatically. All persons should be made to understand that doors must be kept closed as much as possible.

"(G) Where possible, workings should be in panels so as to confine the fire or explosion, if possible, to the panel in which it starts.

"(H) The ventilation should be under the direct supervision of some 'live-wire,' up-to-the-minute man, preferably with fair education and some technical training, and with much underground experience.

"(I) The driving of crosscuts in either entry or rooms, should be given the preference over the driving of either rooms or entries.

"(23) Coal dust seems to be explosive in proportion to its dryness and fineness and in proportion to the relation of volatile matter to volatile matter plus fixed carbon, the higher this quantity, the more dangerous the dust. Anthracite dust seems to be practically non-



#### On a Safe Slope

Group of Rocky Mountain Coal Mining Institute men on man trip descending into Reliance No. 1 mine to see rock-dust barriers and other safety devices as well as loading machines. The trip is equipped with an automatic safety grip which clamps on the rail whenever the rope goes slack.



explosive, whereas bituminous or lignitic dust may explode even when the moisture or ash is above 25 per cent and may propagate any explosion when incombustible matter (ash plus moisture) is over 60 per cent. A slight quantity of methane (1 per cent or over) in the air makes dust more explosive. Less than one pound of fine, dry, bituminous or lignitic dust per lineal foot of entry will propagate an explosion with violence. Dust larger than 20-mesh is thought not to enter into explosions, but dust of about 100-mesh is dangerous and if of 200-mesh or finer constitutes an extreme hazard. Much of the settled dust on rib ledges is finer than 300-mesh.

"(24) The formation of dust is prevented to a certain extent by the use of longwall instead of room-and-pillar mining, by use of more holes and less explosive per hole in blasting, by use of the hydraulic cartridge or some similar method of bringing down coal.

"(25) Strong ventilating currents may remove dangerous dust from working faces, but such currents rarely are found at the face. On the other hand, strong currents of dry air tend to abstract moisture from the coal, making the dust the more dangerous. Dust removed from moving cars by strong air currents later settles on mine surfaces, constituting a definite hazard. Where water is available, water sprays should be placed at convenient points so that loaded cars may be sprayed as they leave the branch entries.

"(26) Humidification of intake air by steam, etc., rarely adds moisture to mine dust but it does have the helpful effect of preventing dry intake air from abstracting moisture from mine dust. However, the large investment required to provide the requisite volume of steam will probably prevent the general adoption of humidification by this method.

"(27) Sprinkling of roadways with the water car is not effective as it does not touch the dry, fine, settled dust on timbers or rib ledges, this dust being the most dangerous found in mines. By means of a small centrifugal pump, mounted on a truck adjacent to the water tank water can be delivered under such a heavy pressure that the roof and ribs are wetted thoroughly.

"(28) If a hose is used continually and systematically to wash down the roof, timbers and ribs and to wet the floor of all adjacent workings, the wetting being done by men who have no other duties, it, in our opinion, will be safe and effective if the water lines are kept at or near the coal faces and hose is available to keep the face wet.

"(29) A sprinkling system as above described, cannot be used on intake aircourses where winters are cold, except where preheating is done, and can be used only at great expense for timbering, etc., where roof, rib or floor material would be badly affected by water.

"(30) Rock dusting is preferred by many explosion experts to sprinkling as a preventive of explosions. The rock dust cools the flame and quenches it whether the explosion is one of dust or of methane. Moreover, if sufficient rock dust is present, it will prevent ignition of coal dust. Rock dusting is compulsory in certain classes of coal mines in Great Britain.

"(31) The rock dust should be 100-mesh or finer; should have little or no combustible matter; should have little or no free silica, as that material endangers the health of those breathing it; should not absorb moisture, and should not tend to pack or harden when left standing.

"(32) Rock dust should be placed on the ribs, timbers, roof and floor of haulage and working places by hand or by machine, and rock dusting should be repeated when the percentage of incombustible in rib or road dust falls below the required quantity to make the dust non-ignitable. This percentage is generally about 60 but may be as high as 75 to 80 if the coal dust is very fine or very high in volatile matter, or if there is one or more per cent of methane in the air. The rib and road dust should be sampled and analyzed whenever it is suspected that the coal-dust percentage is getting high. Dust should be removed from the mine at intervals.

"(33) Rock dusting of ribs, roof and floor, as above described, should be supplemented by placing rock-dust barriers the purpose of which is to confine or limit an explosion which might get a start. At least a half dozen of these barriers should be placed in series in each location, and should be made in accordance with recommendations contained in Bureau of Mines Bulletins 20, 26, 56, and 167. Improperly constructed barriers are useless, but well-constructed and well-placed barriers have quickly stopped violent explosions.

"(34) Any mine owner having dangerous dust or wishing to know whether his dust is dangerous should get in touch with the U. S. Bureau of Mines through the Director, engineers of that bureau having made detailed study of coal-dust problems. Any mine official also contemplating the use of rock dust should get in communication with Bureau of Mines.

"(35) In our opinion mines having dangerous dust with or without methane should both use rock dust and sprinkle the workings with water, the mines being sprinkled as previously described, but where water injures roof, ribs, or floor, or where water is not available, or where the workings are so cold that water freezes, the ribs, roof and floor should be covered with rock dust and dust should be placed on well-constructed rock-dust barriers at the entrance of panels or long entries. Even where only a sprinkling system is provided, the barriers should be used, but they should be in a series of six or more at each location and should

# SOME MINES NEED 80 PER CENT ROCK DUST

THE Rocky Mountain Coal Mining Institute is by no means satisfied that the commonly accepted "safe" proportion of 55 per cent inert matter in coal dust renders that dust non-combustible. It is all too familiar with the highly inflammable, resinous and volatile Utah coal dust. Therefore, it declared, in the safety report it adopted Aug. 8, that the proportion of inert matter in mine dust should be 60 per cent in any mine where any reliance is placed upon rock dusting and 75 or 80 per cent where the coal dust is very fine and highly volatile. The institute is so impressed with the dangers of coal dust that it recommends not only complete rock dusting, including the use of properly constructed barriers but also careful sprinkling in mines making methane.





**Car Designed for Safe Transport of Hay**

Going the Institute safety code one better, the Union Pacific Coal Co. is safe even to the handling of its mule and horse feed. This hay car has both a top lid and a rear drop door to prevent chance sparks from dropping in and to prevent spillage en route.

be constructed and maintained in accordance with instructions in Bureau of Mines' Bulletins.

"(36) No electric equipment should be placed underground except that of permissible type where such is available. Wherever permissible equipment is installed, a definite and complete system of inspection should be instituted, to insure equipment remaining in a permissible condition.

"(37) All possible precautions should be taken against occurrence of electric arcs in coal mines whether gaseous or non-gaseous.

"(38) The fireboss should not be assigned any larger district than he can properly cover in three hours without undue hurry, and the latter part of his shift should be confined to his inspection duties. Any official showing signs of carelessness in enforcing the state mining laws should have his certificate revoked.

"(39) Safety inspection of all mines should be made at least annually by competent outside mining men, preferably a safety engineer, and where feasible, this might be attained by annual temporary exchange of inspectors between the companies operating in different coal fields in order to obtain benefit of an interchange of ideas. We believe the suggestion regarding the exchange of inspectors to be practical and would recommend its general use.

"(40) Where a local safety man is employed continu-

ously, his reports should be made direct to the highest officials of the company and copies furnished to local officials. Local safety men should preferably be young, vigorous engineers of experience able to explore all workings and capable of reading and interpreting up-to-date technical articles on coal mining.

"(41) All underground officials should be required to carry a copy of the state mining law and to be familiar with its contents, and there should be posted in conspicuous places near every working mine, printed cards covering the provisions of the state mining laws concerning mine safety and also giving definite instructions to all workers about mines as to safety practices.

"(42) Miners rarely have any adequate idea as to what constitutes safety in coal mines, and this applies almost equally to the experienced miner and to the man who has worked in mines only a few months or a few years. To remedy this condition, an extensive campaign of education of miners should be instituted, and in this the mining companies should participate, getting aid from state and federal governments.

The mining companies should issue bulletins and letters on safety subjects, possibly have meetings at which safety is discussed or have local or outside speakers familiar with mine safety address the mine workers, or have moving pictures with safety subjects illustrated.

The state and federal governments should have well-informed, conservative mining men available to go among miners to talk safety to them or to issue pamphlets descriptive in simple language of safety practices and methods in mining.

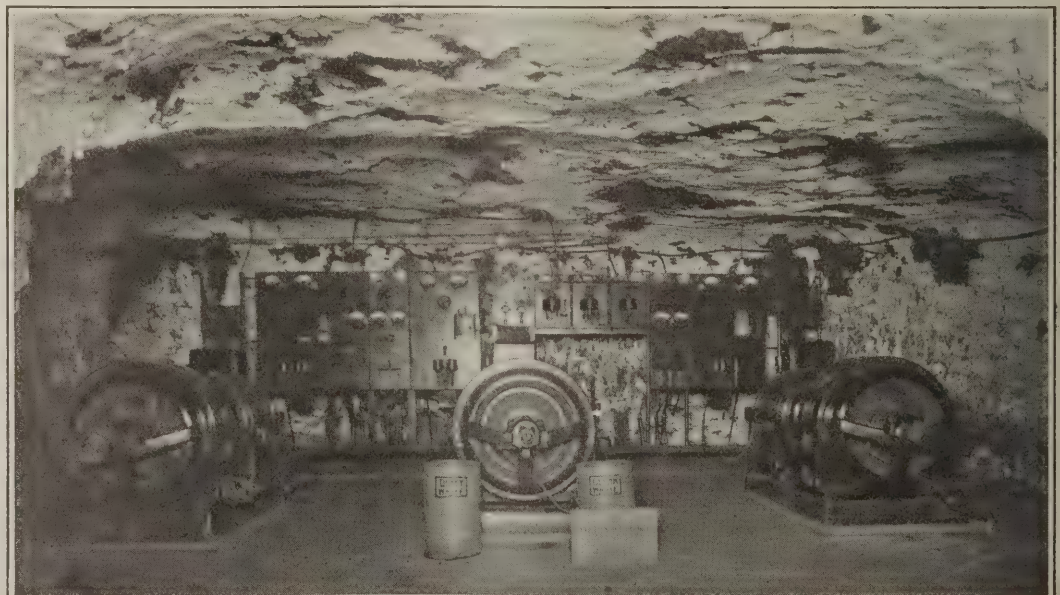
"(43) All ventilating fans should be equipped with pressure recording gages and mine foremen should examine them to determine whether ventilation conditions are normal before allowing men to enter the mine.

"(44) Safety signs calling attention to specific dangers should be posted in several languages at conspicuous places throughout the mine and kept in such condition that they may be easily read.

"(45) Underground stations housing pumps, hoists, motor-generator sets, transformers or similar equipment, should be thoroughly fireproofed, using concrete, gunite or similar material."

#### **Protected Against Fire**

Motor - generator set in Mine No. 1 of the Union Pacific Coal Co. at Reliance, Wyo. Not a stick of wood or other flammable material is used in this rock-and-concrete room. The doors are flame-proof, making the whole a reasonably safe place.







Springfield High School Radio Club

## School Boys Work Out New Radio System for Mines

Springfield, Ill., Club Transmits Voice Vertically Through Ground—Scheme May Be Great Aid in Rescue Work—Previous Radio Communication With Mines Needed Metallic Conduction

BY A. B. McCALL\*

Springfield, Illinois



A. B. McCall

INTEREST has been aroused by the successful experiments of the Springfield High School Radio Club in underground communication between the surface and the interior of a mine, where 250 ft. of soil and rock intervened; not that such communication was unprecedented, for some previous attempts had been successful, but in every previous case dependence at such depths had been placed on con-

duction by wires, pipes and rails. In this instance there was direct, vertical transmission, using only the ground as a conductor.

The experiments were made at the Woodside mine of the Peabody Coal Co., at the edge of the city of Spring-

field, Ill. It was the culmination of much enthusiastic experimentation by the Springfield High School Radio Club, which had been working for many months with the technical advice of Frederick C. Holtz, an electrical engineer, and under my direction.

Thus it was demonstrated that it is possible to talk through the ground to men in a mine no matter if every entry is blasted shut by an explosion and every wire or pipe or rail line so badly broken as to be worthless as an aid to radio communication. Something new had been done for the mining industry and the men in it—something that may prove of great value in the mine rescue work of the future.

The radio club succeeded in its attempt while it was making official tests for the U. S. Bureau of Mines. It had won recognition by the government as an official experimental agency co-operating with the bureau in mine radio because its work in conduction of T.P.S. signals and voice between mine interiors and the surface had been so efficient and because its reports had been so intelligent and comprehensive that they were considered valuable fundamental data for the bureau's information.

The bureau several years ago undertook a series of investigations along this line in order to determine a simple and practical design of apparatus which might

\*Instructor in mechanical drawing at the Springfield high school and faculty advisor for the high school radio club. Consulting engineer in radio for the U. S. Bureau of Mines.



be used for transmitting and receiving the human voice through the ground to and from deep mine interiors in cases of disasters where rescue work is in progress.

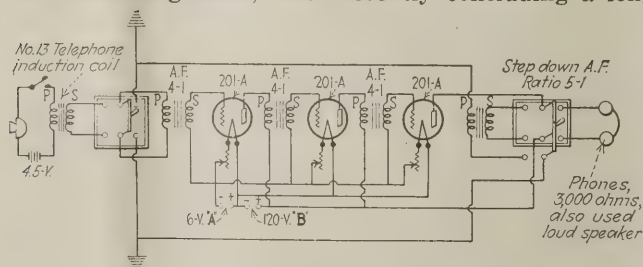
The popularity of radio and its many points of mechanical and electrical interest have led many people recently to undertake similar investigations and in consequence in the past year experiments of this character have been reported from many states in the union and many foreign countries.

The high school radio club of Springfield first achieved distinction in a series of experiments with radio in the nearby coal mines, where, in March, April, and May, 1923, it succeeded in sending and receiving both code signals and voice in and out of the mines from points a mile back in the mine interior and 250 ft. below the surface. Stories of its efforts in this connection were at that time published in a number of magazines and newspapers, and in the meantime reports of its experiments were submitted to the director of the U. S. Bureau of Mines by the president of the United Mine Workers of America, John L. Lewis, who personally volunteered an offer to co-operate with this club and the U. S. Bureau of Mines in any way that he could be of assistance.

It was then that the club won recognition from the bureau as an experimental agency. Following this recognition it was assigned the duty of gathering fundamental data concerning the conductivity of the soil and substrata lying between the coal seams and the surface in Illinois. When this assignment was made the club was lent experimental apparatus known as the T.P.S., or ground-telegraph, code transmitting and receiving sets.

The club completed a series of experiments with the apparatus lent by the Bureau of Mines, but while this was going on, the Club's experimental committee was quietly and systematically attempting to work out a plan to transmit the voice by ground conduction.

A series of investigations into mine radio conducted by the U. S. Bureau of Mines and other experimental agencies have, up to the present time, convinced engineers working on this problem that radio will be of limited usefulness for communicating underground in mine rescue operations. Some of the conclusions of the bureau engineers, after recently concluding a long



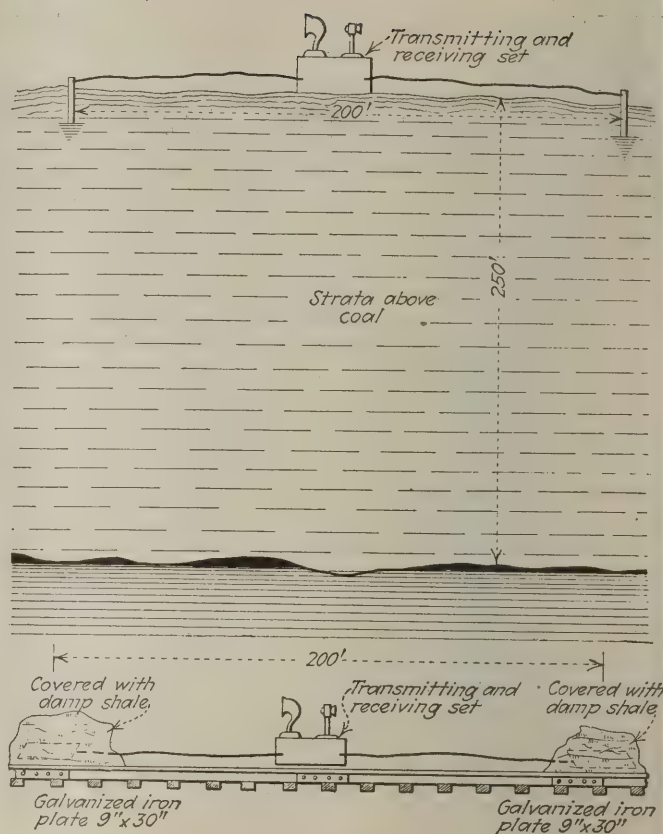
**Circuit by Which Surface Spoke to Mine**

This diagram shows the circuit used successfully, at Springfield, Ill., to exchange conversation vertically through the earth by ground conduction. No difficulty was experienced in conversing through 250 ft. of solid strata.

series of tests with radio in the mines about Pittsburgh, are, in effect, as follows:

First, radio waves will not penetrate through a sufficient thickness of earth strata to make radio practical for mine-rescue work without the aid of metallic conductors of some kind to act as a guide to the electromagnetic carrier waves.

Second, successes with radio even with metallic conductors, would be limited to the conducting qualities of



**Section Shows Position of Surface and Mine Sets**

The relation of the mine entrance to the surface station and the rescue station is immaterial as the currents pass through the solid strata and not through conducting media in the mine roadways. This shows the arrangement at the Woodside mine on April 27 when the successful experiment was made.

the metallic conductors, such as trolley wires, light circuits, telephone circuits, water pipes and mine-car rails.

Third, in the event of a cave-in or a mine explosion there is a great probability that the metallic conductors would get broken and perhaps grounded. This would reduce or destroy their ability to aid in communication with the underground workings just at a time when communication from the mine interior to the outside world might be most needed.

Realizing all these limitations the Springfield High School Radio Club attempted to find ways to overcome them and to devise a practical means of transmitting and receiving voice currents by ground telephony.

In this connection it will be evident that any method of communication for mine-rescue work will naturally have certain limitations, but the one big question to be considered is: Do those limitations make the system impossible for emergency use in mine rescue?

Of course, any method of communication with voice that would be simple to operate and easy to take care of should be as free as possible from interference from the natural elements, and anyone who has had any experience with radio is aware of the fact that in order to get any results with it, either in sending or receiving, not only does the operator have to learn to tune the apparatus but static and signal fading conditions tend to interfere occasionally and might do so at an unfortunate time for mine-rescue work.

As a result of the Bureau of Mines experiments, J. J. Jakosky has discovered some of these limitations of radio but he observed that as long as metallic conductors exist in the mine, radio communication between the surface and points several thousand feet back may be moderately successful even though small breaks may



occur in the conductors. Metallic conductors merely act as guides to the radio carrier wave which carries the voice so that small breaks may be jumped.

It has been repeatedly stated by men of mine experience that any set of apparatus used for mine-rescue work should not have to be tuned like radio, should have some means of eliminating static, should be simple to operate, should work with reasonable certainty and without difficulty in the event of an emergency and should not ignite gases. In this respect we can hardly feel as yet that radio alone will fill the bill.

With this information the radio club, after a series of discussions in meetings of its experimental committee tried out its system at the Woodside mine.

The test was successful. The students were subsequently informed by engineers of the Bureau of Mines that so far as available records disclosed, the club is the first experimental agency successfully to transmit and receive voice currents vertically to and from mine interiors using the ground as a conductor.

When all factors are considered, which enter into the ground conduction method of voice transmission, it will be readily observed that for simplicity, for dependability of service, and freedom from natural interfer-



A Flashlight of the Experimenters in Action

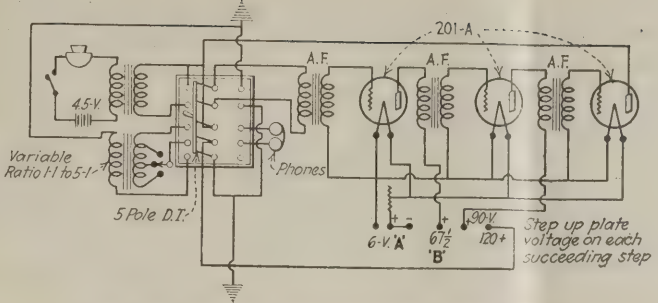
This group of radio club students actually heard the voices of those on the surface and talked with those above.

ences this system of underground communication may be expected to have many points of advantage over radio alone as a communicating medium.

For instance, this type of ground telephony, as will be noted in the circuit diagram, requires absolutely no tuning for success either in sending or receiving. It is further evident that the ground is likely to be a nearly constant conducting medium from month to month, especially if ground plates are buried to a reasonable depth below the surface soil to get away from the extremes of dampness and dryness.

The apparatus used by the radio club for vertical transmission of voice current consisted of a telephone transmitter with an induction coil with the line leads therefrom connected to the input of the first amplifier stage of a radio amplifying set. The voice current then passes through the desired number of stages of audio frequency amplification and passes out through the output connections and through a step-down audio frequency transformer (a 5-to-1 ratio being used with success) from which ground leads are taken by insulated wire to the ground electrodes which carry the voice current into the ground.

In permanent installations these ground electrodes preferably should be buried a few feet under the surface. Their distance apart depends upon the distance



More Compact Arrangement of the Circuit

This system, using three stages of amplification, has been devised for future experimentation.

that it is desired to send the voice currents through the ground, remembering that they can be sent practically from four to six times as far as the distance between the ground electrodes at the surface.

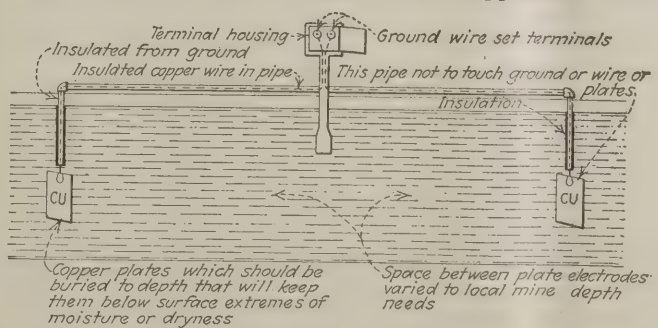
In the practical application of this system of underground communication it may reasonably be expected to operate successfully under conditions that have been suggested by mining engineers, mine owners and superintendents.

For instance, it should give good results in a mine having refuge chambers in each of several main divisions of the mine, a refuge chamber, for instance, in each of possibly four divisions, north, east, south and west.

An apparatus equipped for transmitting and receiving voice through the ground could be installed in each of the four refuge chambers, and there protected carefully from moisture accumulations. All battery terminals should be properly protected to avoid sparking. Each apparatus must have two ground electrodes connected by insulated wire to the set. These should be driven or buried in the roof or floor. Their distance apart should be equal to from one-fourth to three-fourths the depth of the mine, depending on the local conductivity of the sub-strata. The electrodes should be copper plates buried under damp loose shale or some such soil that is not too dry, or cemented in some manner securely within a slot in the roof to insure a good contact.

On the surface directly above each refuge chamber it would be practical to bury electrodes a similar distance apart, approximately 6 or 8 ft. beneath the soil and have them connected by insulated wire to a surface terminal housing as shown in an accompanying drawing. Such a housing would contain only the two terminal connections with the wires running to the buried electrodes.

It would then be practical for the mine office to be connected by relay or to have a portable apparatus which



Suggested Method of Housing Surface Terminals

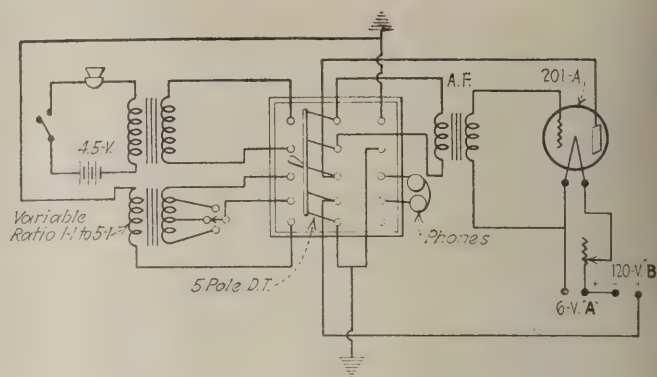
The plates are sunk to a depth sufficient to assure that they will be in strata unaffected by the sun. It is important to have conditions standard, if possible so that no manipulation of the receiving instruments will be necessary.



in the event of an emergency could be rushed to the surface terminal above the refuge chamber, which houses the entombed men, and terminal connections made at once. A push button opens the circuit and a simple switch makes the change from transmitting to receiving. Miners entombed could easily talk to those at the surface set and vice-versa.

In the experiment conducted by this club, April 27, 1924, at the Woodside mine at Springfield, this is exactly what did happen, except that the experimenters below were not entombed.

This type of apparatus could save valuable time in case of disaster if the man leading the rescue party would station himself at a point near the rescue operations, bury the electrodes and with his set, weighing about 29 lb., communicate directly with the surface instead of using messengers.



**Ground Telephone Circuit in Simplest Form**

Here only one amplifying tube is used. Any good amplifying tube may be used for this purpose. On all the arrangements in these several illustrations patents are now pending.

## What Happens When a Coal Mine "Goes Up"?

**Bureau Men Show Crowd At Rock Springs, Igniting Dust Both by Electric Arc and Blown-out Shot—Transformer Smokes Too**

AT THE Wyoming state first-aid and mine-rescue meet, held at Rock Springs, Wyo., Aug. 9, the Bureau of Mines demonstrated effectively what happens when an electric arc or a blown-out shot ignites coal dust, and what does not happen when the coal dust has been rendered immune from explosion by admixture of rock



**Arcs and Coal Dust a Dangerous Combination**

This explosion, inside the gallery which had just been used in the Wyoming state rescue contest, proved that point to the crowd, a block away across Rock Springs First Aid Park, Aug. 9.

or adobe dust. Also, evidence was shown that a transformer should not be left unprotected in a mine.

The first act of the show was the ignition of coal dust by an electric arc. A long wooden gallery, that had been used for the rescue contests, served as the "mine." In it an electric arc was obtained by pulling a circuit breaker on average mine voltage. Twenty-five pounds of fine coal dust were blown over the arc made by the opening of the circuit breaker. The result was a great flash of smoke and flame as the coal dust exploded, simulating what happens when an arc occurs in an atmosphere containing coal dust in suspension. Water from a fire hose saved the gallery for the rest of the show.

Next, the arc was pulled just after another 25 lb. of dust had been blown into suspension within the gallery; but in this case the result was different. The dust was 60 per cent adobe and only 40 per cent coal. Nothing happened except a little flash of the arc and a rolling, but harmless cloud of dirt from the mouth of the gallery. The adobe had stopped the "mine explosion."

Meantime two 440-volt, 10-kw. transformers with their secondaries shorted in plain sight of the audience, heated up dangerously and emitted clouds of smoke from the boiling oil within them. However, the flash-over always likely in such cases, did not occur, but the mining men got the idea just the same. Transformers have dangers like most other electrical apparatus. They should be kept off the intake airways in mines and should be housed in flameproof stations with self-closing doors, and otherwise protected.

The finale was a whooping blast which blew the gallery to pieces and sent up a frightful cloud of flame and black smoke. It was a dust explosion caused by a "blown-out shot." The gallery was loaded with fine coal dust on rafters and shelves just as coal dust accumulates on roof and ribs in a mine entry. Then a cloud of it was blown into suspension just as a small cannon at one end of the gallery fired a spurt of flame. The result was satisfactory to everybody concerned. The gallery disappeared.

This picturesque demonstration to teach the lessons of mine safety, was the first of its kind ever held in the West.



**Wham! Up Goes The Whole "Mine"**

In this case, fine, dangerous coal dust was not only piled through the gallery just as it accumulates in a real mine entry, but 25 lb. were thrown into suspension. A little cannon fired the "blown-out shot." The instant after the picture was taken the gallery "went west." At this instant the end where the shot was fired was being blown to pieces and the air blast through the gallery had just begun to blow out the burlap curtain at the other end.





## News Of the Industry



### C. P. White Expected to Prove Big Asset To Government Coal Division

Broad Experience in the Industry Will Be Helpful in Building Up Export  
Business—Enjoys Full Confidence of the Trade—  
Assumes Duties This Week

BY PAUL WOOTON

Washington Correspondent of *Coal Age*

Under the immediate direction of C. P. White, the new head of the coal division of the Bureau of Foreign and Domestic Commerce, the great influence of the department and the use of its far-flung facilities are to be employed in an effort to be helpful to the American coal industry. As is known generally, Mr. White's circumstances are such that he can accept public service with only secondary regard for the salary. Because of that fact the department has added to its staff of commodity specialists a more capable man than ordinarily would be attracted by the government's idea of technical salaries.

Mr. White needs no introduction to the American coal trade. He has been associated with the coal business since he left high school. The fact that he has been called upon on a number of occasions to serve as a member of scale committees gives an indication of his detailed knowledge of the business. As a young man he was connected with the coal department of the Wheeling & Lake Erie R.R. Later he was connected with coal-dock operations at Superior, Wis. At one time in his career he was manager in the Northwest for the Pittsburgh Coal Co. He served the Carnegie Dock & Fuel Co. at another time in the same capacity. He has been prominently associated with the activities of the Pittsburgh Vein Operators Association. As general manager of the Clarkson Coal Mining Co. he acquired practical experience in the operating end of the business. His familiarity with the situation in the Northwest and in Canada resulted in his being chosen to direct that important distribution for the Fuel Administration. In similar fashion he was called upon to handle the Northwestern distribution when the federal government took a hand in the situation following the strike in 1922.

Because of his long association with the business and his wide acquaintance among the producers and distributors of coal, he undertakes his work with the important advantage of enjoying the full confidence of the industry. While he has some very concrete ideas as to the assistance which the department can extend to the coal

industry, he will recommend no program until he has conferred with the industry. He believes the suggestion as to the steps which would be most helpful just at this time should come from industry rather than from the coal division. At the same time Mr. White realizes that were he to sit in his office and wait for suggestions to come in a considerable portion of them would come from those who have axes to grind. To get a real cross-section of the more urgent needs of the business, Mr. White believes it will be necessary to obtain this information by personal contact when ideas can be drawn from a man who is too busy to write them in or who fears that his motive might be misinterpreted.

#### Government Activity Resented

In certain quarters there is a feeling of resentment aroused by any activity of the federal government which has to do with coal. This has its origin largely in the fear that the government will seek in some way or other, eventually if not now, to interfere with the normal conduct of the business. No such apprehension is justified in connection with the activities of the Department of Commerce, at least.

In the matter of increasing our exports of coal Mr. White entertains no dream of sudden expansion. While he realizes that we do not occupy an advantageous position to compete in the world's coal markets, nevertheless he thinks American genius for organization, backed by the country's capital resources, should find a way to increase our exports of coal. He points out in that connection, however, that progress in that direction will be slow and beset with many difficulties. Since much more is involved than the sending out of salesmen to take orders, Mr. White feels that there should be concentration on this problem by the best minds in the industry. He admits that our overseas coal trade cannot be increased greatly beyond its present dimensions without correlating this trade with other enterprises, which in most cases would involve large capital outlay.

While Mr. White's assumption of his duties at the Department of Commerce was the matter of immediate interest

### Besson Passes Test and Is Reappointed

Leon Besson, who was appointed state mine inspector of Kansas April 1 and removed on July 12, was restored to the position Aug. 18 after passing an examination for the post. An ouster suit was brought against Besson on the ground that he had not qualified by taking the inspector's examination before the state mining examining board. The court held that the inspector is required to take the examination. The Industrial Court, which appoints the inspector, then removed Besson and designated Ernest Shaw, deputy, to act as inspector. Besson took the examination Aug. 16, passed with a high rating, and his reappointment followed.

in Washington this week, there is another development which may take more definite form in the near future. Those who are directing the Republican campaign and those who are serving in a similar capacity under the banner of the Democratic party are much concerned over the discontent among mine workers who are out of employment. They fear that many of these men are likely to vote for Senator La Follette. The concern seems to be greater among the Democratic leaders. It is their impression that the loss of this vote will hurt their party more than the Republicans.

The Republicans, however, do not concede that a majority of these men are normally Democrats. They point to the fact that John L. Lewis is regarded as a leader in the Republican party. His name was discussed seriously in connection with the Vice-Presidential nomination. Many other leaders among the mine owners are known to be affiliated with the Republican party and it is contended that their political convictions are shared by many of the mine workers. However that may be, each of the old parties is very anxious to suggest something that will increase employment in coal mines. Some are of the opinion that the situation in such doubtful states as Indiana and Ohio might be helped materially were the United Mine Workers induced to accept a lower wage scale. It is known that such a suggestion would be spurned by the leaders of the mine workers, but some are of the opinion that the rank and file of the union might be influenced to bring enough pressure on them to cause them to call another conference.



## Home Trade Unsettled, British Producers Keen on Export Business

Nearness to Continent, Long-Established Connections, Large Supply of Ships and Low Freights, Says Hutchinson, Are Obstacles to American Headway in European Markets

Philadelphia, Pa., Aug. 26.—“The report made by the David Lloyd George committee, professing to be against the nationalization of British coal mines but recommending governmental ownership of the coal and the leasing of the mining rights, is generally regarded in England as a political document,” said S. Pemberton Hutchinson, president of the Westmoreland Coal Co. and also president of the National Coal Association, in an interview today. Mr. Hutchinson, with several members of his family, returned from a six weeks’ trip to Europe, having visited England, Wales and France. While abroad he took occasion to sound out mine owners and other business people on the British coal situation. Mr. Hutchinson’s statements on conditions in the British coal industry were elicited in response to a series of questions propounded to him, as follows:

What is the present condition of the British coal industry?

“The British coal situation is not good. The iron and steel trade in Great Britain is in a depressed condition, over one-half of the blast furnaces being closed down. This being a basic industry, its condition naturally is reflected in that of the coal industry. As a result of that condition there is a very light local demand for British coal. Thus the British colliery owners are giving special attention to the export business. Their nearness to the European market, their long-established connections, the large amount of ocean-going tonnage and low ocean rates all contribute to the strengthening of their export business and prevent, in my opinion, American coals from gaining much headway in European markets at this time.”

What effect will the general increase in wages under the recent settlement in England have upon the ability of the English coal operator to compete in the world’s markets?

“The new wage agreement has not been in operation a sufficient length of time to enable anyone to determine how it will work out. It is my belief, however, that it will have but little effect upon the export business. I think the English operators will strive to expand their export business, even though they make very little money out of it.”

What in your opinion will be the effect of the Ruhr settlement on the world’s coal markets?

“It ought to help the coal markets of the world, because it will make for commercial stability. It is believed that the adoption of the Dawes plan will result in a more prosperous and stabilized condition of all the nations of the world, thereby increasing the consumption of coal.”

What suggestions have you for furthering the American overseas coal export trade?

“I suggest that the American coal exporter can materially improve his standing in European markets if he will continue to advertise American coals abroad and send cargoes for introduction into the markets of the world, primarily with the view of establishing the coals rather than making much immediate profit on the transactions.”

How do the housing and living conditions of the British miner compare with those in this country?

“The housing and living conditions of the miners in Great Britain are by far worse than they are in the United States. This opinion is based on my own observations and is corroborated by statements and descriptions contained in the report of the Lloyd George committee.”

How is the report of the Lloyd George committee on the coal situation regarded by the industry?

“It is looked upon as a purely political document and its recommendations are opposed by both operators and miners.”

In a recent analysis of the British coal situation English coal distributors stated that the fundamental problem in the industry was regularity of demand and that all other problems would be corrected if demand were stabilized. Does this seem to be the general opinion among thinking people in Great Britain?

### Workable Stabilization Plan Lacking

“Yes; those who have studied this subject seem to be of one accord, but so far no one has been able to devise a plan of stabilization that is practicable or workable. It is my opinion that they will not be able to do so, because in order to stabilize the demand for coal it would be necessary to compel every user of coal to make his purchases at fixed times. This form of regulation would be contrary to sound economic laws and I do not believe it would ever be successful.”

The Miners’ Federation of Great Britain is advocating complete unionization of the mines and has taken steps to have a bill introduced into Parliament making membership in the federation a condition precedent to employment. Are the British coal-mine owners taking this proposition seriously?

“I do not think so. From my observations I would say that this is a political move, and apparently the mine owners do not anticipate the enactment of the bill.”

During the course of Mr. Hutchinson’s interview he took occasion to state that since his return from abroad he has become convinced that the coal trade in this country is on the upgrade, his belief being predicated on increasing inquiries about coal and future contracts, as well as increasing output.

### Coal Stock Report Sept. 1

After some effort, the Geological Survey and the Bureau of the Census have found money enough to take a coal stock report as of Sept. 1.

### Big Merger of Hard-Coal Independents Planned

The consolidation movement apparently is about to spread to the anthracite field, a special dispatch from Scranton, Pa., stating that another big hard-coal producing organization that is expected to be a competitor of such companies as the Hudson and Glen Alden is in process of formation. A group of independently operated collieries and mines are to be merged to form the new organization. All companies mentioned are large producers of anthracite.

A group of Pennsylvanians, among whom are mentioned Wm. C. Sproul, former Governor of the state, and Newton D. Jackson, of Philadelphia, are said to be promoting the enterprise. Among the independent coal companies which may be affected by the merger are the Temple Coal Co., the East Bear Ridge, the Scranton Coal Co., the Legitts Creek company and several smaller producers.

A definite move toward the consolidation was manifested clearly over the week-end with the visit to Scranton of former Governor Sproul, whose name has been linked with the promotion of such a merger for some time. A report that bears the weight of authority has it that the former Governor, while in Scranton, completed negotiations for the purchase of the Traders Coal Co., an independent producer, with offices in Scranton. It is known that Mr. Sproul was in consultation with officials of the Traders company.

For some time negotiations have been in progress to buy the coal properties with a view to merging them into one corporation with resources of capital and combined output sufficient to give the stock or bonds contemplated for issuance a high financial rating on the market.

### Farrell Coke Plant Closes as New Clairton Ovens Open

The Carnegie Steel Co. coke plant at Farrell, Pa., was closed Aug. 22, and it is likely that it will never be reopened. The three batteries consist of 212 ovens, but only 50 have been in operation, due to the idleness of two of the three blast furnaces. Whether the plant will be dismantled is not known.

The closing was brought about by the starting of the big byproduct plant of the company at Clairton, Pa. The latter is in position to ship both coke and coal tar for fuel to Farrell at low cost. For the present blast furnace No. 2 will be operated on stock coke.

Tar from the Clairton works also will be used for fuel in the open-hearth furnaces at Farrell.

For the first time since the open-hearth furnaces were built all of them will use coal tar.



## Coal Production on Competitive Basis Is Central Pennsylvania's Need

**Operators Decry Advantage in Low Production Costs Enjoyed by Non-Union Districts Because of Lower Wages—West Virginia Gaining Despite Depression in Union Districts**

"The most important matter discussed at the meeting of the coal operators held in Altoona, Pa., Aug. 22," according to a statement by Charles O'Neill, secretary of the Central Pennsylvania Coal Producers' Association, "was the business situation. The depression in the central Pennsylvania coal field is more acute than in other coal-producing fields. This is due, of course, to the high wage scale obtaining in the union districts. The non-union fields are working on greatly reduced wage scales and are taking the business. The wage scales in the non-union fields permit them to produce coal 50c. to \$1 per ton less than in the union district of central Pennsylvania.

"The number of idle mines in this district, and the working time of the others is as follows: Mines idle, 652; mines working 1 day, 79; mines working 2 days, 85; mines working 3 days, 74; mines working 4 days, 65; mines working 5 days, 44; mines working 6 days, 63.

"In order to offset the reply that non-union fields are having the same troubles today, due to the general business depression of the country, as the union fields are having, I wish to quote a few figures showing comparison between our district and the non-union fields of West Virginia, showing the cars of coal loaded in each section from Jan. 1, 1923, to July 19, 1923, as compared with the car loadings for the same period of 1924: Non-union, West Virginia, 686,154 in 1923, 759,294 in 1924; central Pennsylvania, 502,022 in 1923, 367,613 in 1924.

### West Virginia Catching Up

"The non-union mines of West Virginia gained in production this year 11 per cent. Central Pennsylvania has lost in production 27 per cent. These are the facts.

"The mine workers in their published statements rely upon the reports of the U. S. Geological Survey. These reports are accurate as to the mines that are in operation. They do not cover, for instance, the 652 idle mines in our district. The actual car loadings are the only real measure of one section against another.

"The miners' leaders agree to the proposition that there are 200,000 too many men in the industry and too many mines. The present policy means that the 200,000 men who must leave the industry must be union miners, and the invested capital in the excess mines to be wiped out must be the capital invested by union operators. High wage costs now have the union mines at a disadvantage of 50c. to \$1 per ton in cost as compared with their competitors.

"There is only one cure for the present situation. If prosperity is to return permanently to this section its basic industry, coal, must be put upon a competitive basis. The union miners,

if they propose to remain in the industry, must bear their share of the cost of the 'struggle for the survival of the fittest.'

"The serious questions involved in this issue were a matter of discussion at the meeting Aug. 22. It also will be a matter to be considered at the annual meeting of the operators to be held at Altoona on Sept. 5, 1924.

"The district officers at the miners' union assert that they are helpless in the matter, and that the present policy of supporting a high wage scale in the union fields and a low wage scale in the non-union fields is due to the international officers. In the meantime miners suffer, and operators and business men of this section face bankruptcy."

### Move to Prevent Denial of Civil Rights of Miners

As part of a movement launched to improve conditions and to "stop the denial of civil liberties" in the soft-coal fields the American Civil Liberties Union, 100 Fifth Avenue, New York City, has sent a circular letter to hundreds of attorneys, ministers and officials in the non-union soft-coal districts.

"The suggested action," says the announcement, "includes the incorporation of the company-owned coal town; a fight against the so-called 'yellow-dog' contracts under which miners are prevented from joining unions, and efforts to have deputy sheriffs and local law-enforcing officials paid entirely by the county instead of by private coal corporations. Suggestions also are made for contesting injunctions which deny miners the right to organize and hold meetings, to strike and to picket. The districts chiefly affected are western Pennsylvania, West Virginia, Alabama and Utah."

The U. S. Coal Commission is cited in the announcement as authority for the statement that the domination of those districts by the coal companies is responsible for the "practical abridgement of free travel, free speech and public assemblage," and for depriving miners of "their normal rights."

These findings, according to the Civil Liberties Union, "will go their way into the archives like other government reports unless somebody gets busy to put them into effect. That we conceive to be our job. We are opening a campaign in the non-union soft-coal districts which we trust will result in restoring those communities to the exercise of the ordinary civil rights of American citizens."

The Civil Liberties Union plans to organize committees in the districts affected to work for the Coal Commission's program, and to carry on an active agitation in the localities and the state legislatures.

## Atlantic Coast Line and L. & N. Approve Clinchfield Lease

Officials of the Atlantic Coast Line and the Louisville & Nashville R.R., following simultaneous meetings in New York City, announced Aug. 21 that they would go ahead with their plans for the acquisition by lease of the Carolina, Clinchfield & Ohio Ry., subject to the terms and conditions imposed by the Interstate Commerce Commission in its recent authorization order.

The conditions laid down by the commission included the following:

Applicants must maintain the Carolina, Clinchfield & Ohio as a separate corporate entity and shall maintain a separate organization for the combined properties of the company, with a responsible operating management directly in charge; existing routes and channels of trade heretofore established by other carriers in connection with the Clinchfield must be preserved; the applicants must permit the line of the Clinchfield and its subsidiaries to be used as a link for through traffic via existing gateways of interchange, or via gateways to be subsequently established under authority of the commission by means of connecting lines proposed to be built by the Louisville & Nashville.

The application of the Atlantic Coast Line and the Louisville & Nashville calls for a 999-year lease, and this term is approved by the commission, dating from May 11, 1923.

The lessors are called upon to file within six months with the commission an application to build connections between the McRoberts and Harlan lines of the Louisville & Nashville and the line of the Carolina, Clinchfield & Ohio.

### F. G. Hatton Takes Over Two Kentucky Mines

F. G. Hatton, president of Hatton, Brown & Co., Inc., Columbus, Ohio, announces that his company has taken over two large producing properties in the Betsey Layne field on the C. & O. R.R. in Kentucky. The properties were taken over by the Peerless Elkhorn Coal Co., a \$150,000 corporation, of which Mr. Hatton is president. The properties are the St. Paul Coal Co. and the Big Elkhorn Coal Co., with combined holdings of 900 acres and two operating mines. The output of 500 tons daily will soon be doubled and extensive improvements will be installed. The product will be marketed through the Hatton-Brown Co.

### Conference May Amend Scale In Pomeroy Bend Field

Arrangements have been made for a conference of operators' and miners' representatives which will be held at Minersville, Ohio, soon in an effort to arrange an amended wage scale for the Pomeroy Bend field. The conference will consist of all operators in the Pomeroy Bend field. Many of the mines of the district are idle and it is hoped that concessions in the cost of production can be obtained in order that some of the mines can operate.



## National Safety Council To Hold Its Annual Meet In Louisville, Kentucky

Expectations are that the Thirteenth Annual Safety Congress of the National Safety Council at the Hotels Brown and Seelbach, Louisville, Ky., Sept. 29 to Oct. 3, will be the best yet held. The first edition of the program has just been issued by headquarters at 168 Michigan Ave., Chicago. The opening session will be held Monday at 10 a.m. in the Hotel Brown with the president of the Louisville Safety Council, the mayor of the city and the president of the Chamber of Commerce of the United States among the speakers.

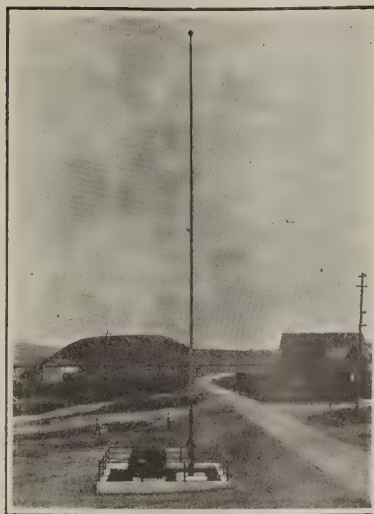
In the afternoon at 2 o'clock the Secretary of Labor will speak on the "Fundamentals of Our Industrial Safety Program," Dr. Arnold L. Jacoby, director, psychopathic clinic, Detroit, Mich., on "Mental Causes of Accidents," Jamie Heron, of Chicago, on "Building Men for Safety," and A. W. Whitney, chairman, American Engineering Standards Committee, on "Standardization of Safety Codes." A motion picture, the new industrial film of the National Safety Council, "A Word to the Wise" will then be presented.

### To Show Safety Developments

On Tuesday morning at 10 o'clock the Mining Section will hold its first session with the addresses of the officers, an address by E. E. Jones, electrical engineer, E. E. White Coal Co., Glen White, W. Va., on "Stray Electrical Currents, Their Dangers and Avoidance," C. L. Colburn, who has been travelling extensively, will deliver an address on "Safety Kinks," and W. W. Adams, U. S. Bureau of Mines, Washington, D. C., who has been collecting detailed statistics from members of the Mining Section, National Safety Council, will present summations of those statistics, giving no details, however, as to individual companies. On Tuesday afternoon C. E. Pettibone, vice-president and manager, Engineering Department, American Mutual Liability Insurance Co., Boston, Mass., will show one hundred new slides from photographs contributed by members of the National Safety Council, showing new outstanding developments in safeguarding.

At 10 o'clock on Wednesday morning N. S. Greensfelder, editor, *The Explosives Engineer*, Wilmington, Del. will discuss "The Safe Use of Explosives"; Francis Feehan, U. S. Bureau of Mines, Pittsburgh, Pa., will give an address on "Organizing the Mining Industry for Safety," and J. B. Johnston will follow with an address on "Safety in Underground Use of Electricity."

Thursday morning will see the third session of the mining section with G. F. MacWilliams, electrical engineer, Pennsylvania Coal & Coke Corporation, Cresson, Pa., discussing "Electrical Starting Apparatus from the Viewpoint of Safety"; and probably R. N. Hosler, superintendent Pennsylvania Compensation Rating & Inspection Bureau, "Schedule Rating for Compensation Insurance." This will be followed by a round table discussion.



### Unique War Memorial

Five-ton block of coal placed in front of the Lattimer (Pa.) office of Pardee Brothers & Co., Inc., as a memorial to the company's men who took part in the late war. It bears a tablet with the following inscription: "Memorial to the Employees of Pardee Bros. & Co., Inc., World War, 1917-1918." The enclosure is about 18 ft. square and the flagpole is 80 ft. high.

## Crossed Wires Cause Fire In Ohio Coal Mine

Special to Coal Age

Columbus, Ohio, Aug. 23.—Crossed wires in the Lincoln mine of the Lorain Coal & Dock Co., located near Bridgeport, Belmont County, Ohio, caused a fire late Aug. 22. A portion of the workings were closed up to stifle the flames and it will be a week or ten days before it can be opened and the loss definitely ascertained. In the meantime the loss in output will be about 500 tons daily, as it was one of the smaller operations of the company. It was not necessary for the mine rescue car to be called as there was no loss of life or injury to workers.

## Kansas Open-Shop Miners Join the Union

Employees of three open-shop mines near Scammon, Kan., accepted with alacrity an invitation delivered personally, Aug. 19, by more than 1,000 union miners, to cease work until they might be admitted to the United Mine Workers. The mines affected were the Mackie J., a co-operative mine, operated by twelve men and employing forty-five; Mayer No. 11, leased and operated by Overjohn Brothers and employing forty-two men, and the Stocker mine, operated by George Mertz and employing thirty-seven miners.

## Orient No. 2 Resumes Work

Orient Mine No. 2 of the Chicago, Wilmington & Franklin Coal Co., Herrin, Ill., has resumed operations, after having been idle since July 16. The strike was the result of a controversy between the company and men over the scale for undercutting machine men. Three hundred men are now at work.

## More Glen Alden Mines Close Because of Card Strikes

Special to Coal Age

Scranton, Pa., Aug. 27.—In an effort to impress upon the minds of alleged insurgent union leaders the futility of unauthorized, contract-breaking strikes at its collieries, the Glen Alden Coal Co. has evidently adopted a policy of closing down operations indefinitely after outlaw strikes have been put into effect by the men at the workings.

During the week the Hallstead colliery at Duryea, near here, employing 200 men, was shut down when the miners declared a strike after one of the employees refused to show his working card to a union official. After a day of idleness the men decided to return to work, but the company in the meantime had taken action. The fires were pulled and power shut off. Everything was placed in a condition for a long shutdown and the miners were told that the company had called off operations and the mine would remain closed for an indefinite period.

Similar action was taken at the Woodward colliery, at Edwardsville, about a month ago, with the result that the 1,800 men employed there have been on the idle list for more than four weeks and will continue to remain so for some time to come. Repairs are now being made at the Woodward colliery.

The frequency of outlaw strikes, it is understood, has resulted in this mode of procedure by the company officials.

## Wants Pittsburgh Rates Cut, Others Raised

Under the arrangement in the Lake Cargo coal case August Gutheim, on behalf of the Pittsburgh Coal Producers' Association and other complainants, has submitted to the Interstate Commerce Commission a digest of the testimony on which his argument, to be submitted later, will be based. In submitting the digest of the testimony to the commission, Mr. Gutheim makes the point that the Pittsburgh rate of \$1.66 should be reduced to \$1.26 and at the same time points out that the differential from the Fairmont, Kanawha, Thacker, New River and Pocahontas districts, the so-called preferred districts, should be increased, when due consideration is given the commercial and competitive situation. He presents evidence to the effect that Pittsburgh has lost some 40 per cent of its lake business, while the preferred districts have been gaining. In 1912, when the commission reduced the Pittsburgh from 88c. to 78c., it was pointed out that the latter rate still was too high when measured by the cost of service. At the same time the Norfolk & Western was authorized to increase its rate. The B. & O., the C. & O. and the New York Central, however, made no attempt to justify a rate increase, with the result that the Norfolk & Western could not apply it.

Since that time Pittsburgh rates have been increased 115 per cent, whereas the southern district rates have been increased only 90 per cent, thereby aggravating the situation still further.



## Herrin Mass Meeting Finds No Cure for Ills of Southern Illinois

**Union Men Fail to Attend and Operators Recount Handicaps Imposed by Inelastic Wage Scale—Miners Insist on Maintenance of Present Contract**

"Illinois mines are idle not because of a business depression or because coal substitutes are being used but because coal from other fields is going where Illinois coal formerly went," declared Dr. F. C. Honnold, secretary of the Illinois Coal Operators' Association, at a mass meeting held at Herrin, Ill., Aug. 20. "The output of the mines of Illinois has failed lamentably to show normal consecutive growth during the past dozen years."

The meeting was held under the auspices of the Lions Club in an effort to bring about the rehabilitation of mining in southern Illinois, which is suffering from all the economic ills that a general shutdown and unemployment in its main industry naturally would bring about. The coal operators and state officials of the United Mine Workers were invited to be present prepared to set forth all angles of the case. The union miners, who were held responsible for the present depression by both the coal operators and the railroad officials, failed to attend the conference, but in a letter made public just before the meeting reaffirmed their determination to maintain the present wage scale until its expiration in 1927.

### Faint Hope of Resumption Soon

The conference indicated that there were scant hopes of resumption on the part of the operators. Dr. Honnold and several operators with large mines in this vicinity declared that orders for Illinois coal were steadily declining and that even Chicago customers of long standing were finding it cheaper to pay the heavier freight rates on non-union coal from Kentucky and West Virginia than to buy southern Illinois coal mined under the scale ratified at Jacksonville. "So long as the present scale persists we will observe the scale, but our mines will have few orders," the operators said.

There is no reason to expect, Dr. Honnold declared, that the annual output of Illinois mines for the next five years will exceed 60,000,000 tons a year (the prewar output), in spite of the fact that the bituminous coal consumption of the country has increased 20 per cent since 1912. If Illinois kept pace with other fields she should average 80,000,000 tons a year. This condition holds in spite of the fact that one-sixth of the bituminous coal production of the country is consumed in Illinois.

### Handicapped By High Costs

"Today the mines of Illinois furnish less than half the coal requirements of the state because the cost and consequent price of Illinois coal is too high. More than 50 per cent of the daily production of bituminous coal in the United States is coming out of mines where it is produced at a cost only

slightly over half the cost of similarly circumstanced Illinois mines. Part of this lower cost at competing mines is due to lower wage scales, part of it is due to more favorable contract and working conditions under the wage agreement, and part is due to the rapidly increasing use of mechanical devices and changed methods of mining."

Non-union mines are operating on the wage scale of 1917, Dr. Honnold declared, while Illinois mines pay \$1.25 a ton above the 1917 scale, which was higher than that of the non-union fields. "That differential permits competitors to pay the heavier freight rates to the Chicago market and undersell Illinois coal," he said. "We will have difficulty in regaining those customers and because of our non-elastic agreement with the union we must continue the present scale for three years. The industry loses from \$10,000,000 to \$12,000,000 a year on screenings because of union restrictions—a burden which must be borne by the prepared sizes of coal."

### Inelastic Scale Limits Work

"The operators are not opposed to unionism and they expect to continue to deal with the miners' union, but they feel bound to point out that refusal to accept a wage reduction does not guarantee daily earnings or annual income at demanded high levels when an ample and adequate fuel supply is readily available elsewhere."

"To insist that a non-competitive wage rate shall be written into the contract simply means greatly reduced work time for those who do have some work time and entire idleness for many others and a constantly growing decrease in production, all of which is much worse than a flat wage reduction, since it affects not only the mine owner and the mine worker but is against the interest of every mining community, of every industry and of every household and other consumer of coal in the entire state."

A similar note was sounded by Herbert Taylor and E. C. Searle, large coal operators in southern Illinois. Walter W. Williams, Benton attorney, appealed to the rank and file of the miners' union to insist on a wage reduction, "so that the mines may resume operation and this community not revert to the deserted farming village it was prior to the discovery of coal here thirty-two years ago."

The other side of the picture is given by George Stanfield, city editor of the *Herrin News*, who said that conditions are not as bad as they appear on the surface and that if the mines resume operation the community will soon be on its feet. Albert J. Nason, of Chicago, is sinking two shafts and investing heavily in a new mine in neighboring Jefferson County.

There was general disappointment when it became known that the union

side would not be presented. State Senator William J. Sneed, president of the Herrin subdistrict of the United Mine Workers and reported to be a contender for the presidency of the Illinois district of the union in the December elections, had been scheduled to give the miners' side.

In a letter to County Judge Morgan, who had charge of the conference, Mr. Sneed explained his absence as a protest against discussion of wage matters. He said it was his understanding that the conference would seek a remedy for the freight-rate problem as affecting west Kentucky and southern Illinois and that the conferees would unite to ask the Interstate Commerce Commission to eliminate the additional rate contemplated by them for southern Illinois coal.

Union officialdom attributes the present depression to the freight rate on coal and it has enlisted the Illinois Commerce Commission in the fight for a reduction in the rate. John L. Lewis and the officers of the Illinois district have reaffirmed their unwillingness to consider any reduction in the wage scale and Senator Sneed took his stand with them.

William Daech, president of the Taylorville subdistrict of the union, who came to the conference but did not participate, said that the union would never accept a cut in wages.

"We know it means unemployment for many miners, but if we took a cut the non-union operators would simply reduce their scale still further and Illinois would once more be idle. We'd rather starve on a high wage scale with irregular work than starve on a lower wage with more work."

### Railroad Men Tell of Work

Conrad Spens, vice-president of the Chicago, Burlington & Quincy R.R., and B. J. Rowe, traffic manager of the Illinois Central, described the efforts of their companies to serve the Illinois coal fields, but asserted that competition from non-union coal fields was due to lower cost of production at the mine rather than to freight rates, which they said could not be lowered with justice.

Meantime 35,000 miners are without any work and the other 55,000 miners do not work more than half of the time and twenty-six mines have been abandoned and 112 closed indefinitely.

## 20,000 Belgian Coal Miners Strike Against Wage Cut

Twenty thousand of the 36,000 Belgian coal miners in the Mons basin went on strike Aug. 14, declining to accept a wage reduction of 10 per cent. As a consequence a crisis threatens the nation's coal industry. The operators fear they cannot compete with German coal, of which 442,000 tons was imported last month. The fall in the pound sterling also favors British coal. The Belgian coal stocks are large and the operators declare the wage reduction is inevitable.

The Navy Department has called for bids on 8,000 tons of run-of-mine coal for delivery at South Brooklyn. The bids are to be opened Aug. 29.





## Problems In Underground Management



### This Rock-Dust Barrier Fits Odd Places

No Need for a Cabinet Maker to Make a Trough That Will Dump Dust on the Pioneering Explosion and Will Dump Again When the More Violent Blast Comes

THE JOB of making rock-dust barriers has seemed a delicate and rule-bound task to many coal-mining men. They have figured that troughs had to conform exactly to certain specifications and that the attachments were difficult to design. Not so at Rock Springs No. 4 mine, of the Union Pacific Coal Co. There they are making and installing the "Daniels Dust Barrier" easily and without purchasing anything. Elijah Daniels, assistant foreman, worked out the idea, with the aid of a few boards, a two-by-four and a couple of rods threaded at one end.

#### SIMPLICITY AND ADAPTABILITY

This trough is made of two 8-in. light planks nailed together in the customary V-shape with triangular end pieces. The whole is then mounted on the broad side of a two by four, the ends of which extend out 8 or 10 in. These ends are split down so as to be of triangular cross section with a flat base. This base rests in a stirrup which is made of a piece of  $\frac{1}{2}$ -in. rod bent into a 3x4-in. loop at one end and threaded at the other end so that it can be screwed into wooden plugs driven into the roof of an entry.

The 3x4-in. loop and the shape of the end of the trough base permits the trough to turn through 45 deg. This is calculated to dump only a part of the rock-dust contents so that the balance

will be ready to be thrown into suspension by the recoil shock which almost always follows an explosion.

The superiority of this trough over some types is that it is supported strongly by the two-by-four which runs

#### Model Installation

Elijah Daniels, assistant foreman of No. 4 mine of the Union Pacific Coal Co., Rock Springs, Wyo., who devised this new barrier, showing a few troughs hung on 4x4-in. beams.



its full length. This prevents sagging of the trough under the weight of the dust within it, and thus helps to maintain its sensitiveness of balance and quick response to shock. The width of the trough at its top distributes the weight of the load so that it is easily tipped over as it rests on its 4-in. base in the two stirrups at the ends.

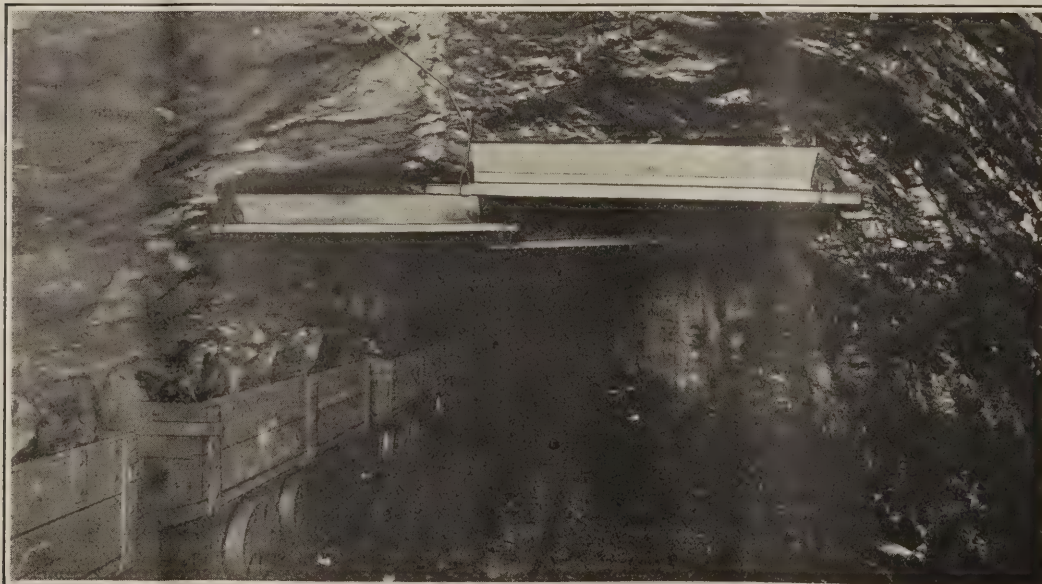
Barriers of any number of troughs can be built with this device and the troughs may be of varying length so that the barrier can be fitted into almost any shape of entry. They need

not all be hung in the same horizontal plane, thus eliminating the roof brushing which is ordinarily necessary to make the roof conform to the level of the barrier. Of course some brushing is necessary where entry head room is insufficient but for no other reason.

In the installations already made in Rock Springs No. 4 mine, the troughs are all about 6 ft. long and arranged in staggered order so that, as viewed from either end of the barrier, the full width of the entry is covered. Mr. Daniels

emphasizes the ease with which these troughs can be made and installed. There are no patents on any features of it and no specially designed materials are necessary.

Elaborate dust-tripping devices look well on paper but in the mine they are apt to warp and get out of shape, in which case they may dump prematurely or may not dump when needed. These troughs fit themselves to the mine. They may not look prepossessing to the visitor but they should effectively smother out an explosion.



#### Daniel Dust Barrier

The wooden troughs can be built of any length, but these are 6 ft. long. The staggered arrangement in this installation of the Union Pacific No. 4 mine, Rock Springs, Wyo., permits the full width of the haulageway to be covered. They need not all be hung in the same horizontal plane, so little roof brushing is necessary to make room for them.



# How to Support a Roof, Thus Increasing Extraction and Avoiding Squeezes

A Big Pillar Is Left, Two Rooms Wide, at Six-Room Intervals—Rooms Are Sealed and Big Pillar Extracted From Two Directions

BY CHARLTON DIXON  
Superintendent, Le Noir Coal Co.,  
Indianapolis, Ind.

Many mines in Indiana have had much difficulty and suffered no small loss by reason of squeezes, that develop because the entry and room pillars are inadequate. They come suddenly, burying rails, cars, mining machines and other equipment beneath them. Apparently no method can be devised that will prevent them entirely. A modification of the usual method of

the second from the No. 9 ends. Both rooms are started full width. This provides a protecting block of coal 45x75 ft. in plan.

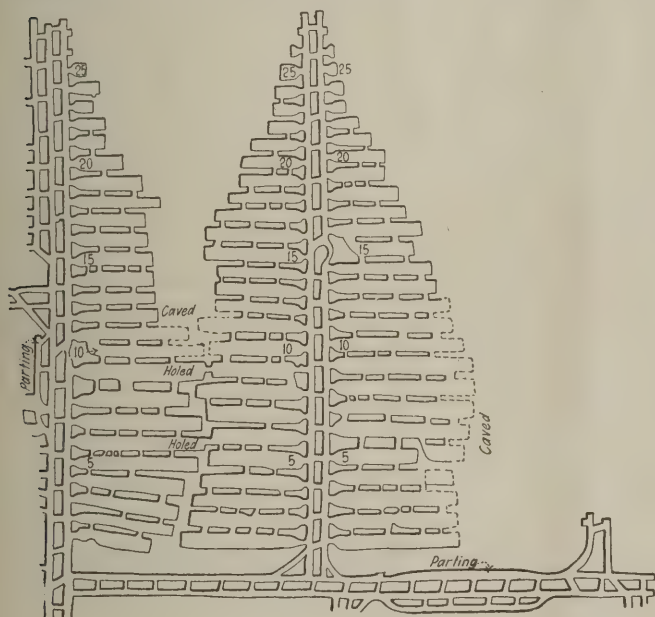
On the parallel entry the room arrangement is the same except that the blocks are staggered. This places the strongest roof support of one entry opposite the weakest part of the roof on the next. The cost is not increased

and the coal left in place is in such position that it can be recovered easily.

More coal is now being extracted from the rooms by this method than ever before. This is accomplished by thinning down the room or rib pillars to such an extent that they will support the roof adequately, yet offer but little resistance to a general cave. The depth of the bed is from 125 to 150 ft. With heavier cover the two short rooms could be left in the solid as a protection to the entries. When these latter passages have been holed through to a new panel the blocks of coal thus left standing could be attacked near the middle of the panel just completed, part of the coal being taken out one way and part the other. This would provide a rapid extraction.

At the depth mentioned, however, the method above outlined has proved to be both simple and safe, affording ample protection to the entries. The old layout, because of a slight but continuous settlement of the tender roof after a few rooms had been worked out and weight had begun to act on the weak pillars, was extremely dangerous, and roof falls were of daily occurrence. By the new method all this has been eliminated. Freedom from both roof falls and squeezes is now enjoyed even during strikes or long periods of shut down.

**BRASS GAUZES FOR FLAME SAFETY LAMPS**—In most flame safety lamps the gauze has been of iron or steel, states Bulletin 227, recently issued by the Bureau of Mines. Some brass gauzes have been adopted, and a few lamps have been provided with copper gauzes. The laws of several states require that a certain number of lamps must be kept on hand at each mine for emergencies. Lamps used in this kind of service should have a non-corrosive type of gauze as a necessary safeguard. Before bonneted lamps became so widely adopted, iron and steel gauzes had advantages over those of brass. To-day, however, it might be more economical to use a good brass gauze for bonneted lamps used in general service.



## Former Working Method

Every little while the roof would start to move, crushing down the pillars, heaving the bottom and burying rails, cars and mining machines, and making much good coal inaccessible. Such coal even where approached from another direction is difficult to extract being laden by the weight of unsettled roof adjacent to it.

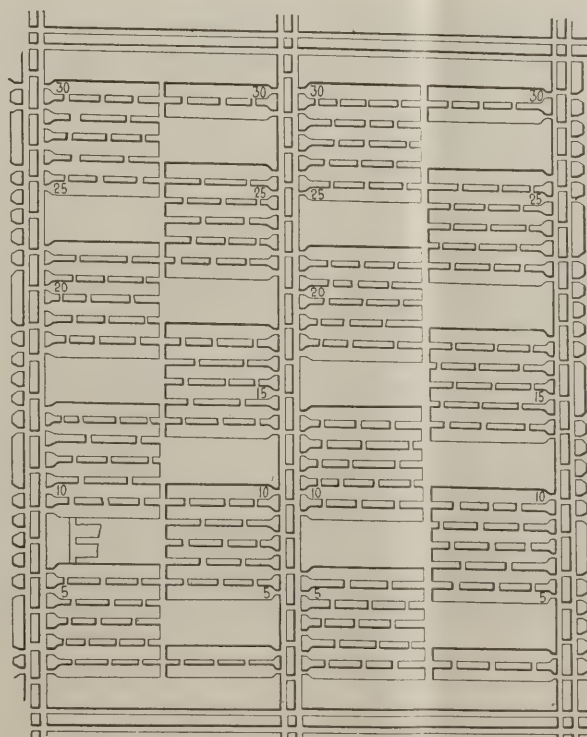
room placement, however, as will be shown, may do much to render operation safer and to save coal that would otherwise be crushed and lost.

About two years ago I took charge of an operation where scarcely a pair of butt entries reached their projected length although none of the room ribs were slabbled. In this region the miners' union insists that tracks be laid in the center of the room. This practice is responsible for the loss of about 30 per cent of the coal in the bed. Under ordinary conditions an extraction of approximately 55 to 60 per cent of the coal is attained. The usual arrangement of rooms is shown in Fig. 1.

In order to prevent the development of squeezes I adopted the extremely simple but efficient method of room placement shown in Fig. 2. Beginning, say, at the lower left-hand corner of the figure, six rooms are successively turned from the entry. Next the distance occupied by two rooms and their rib pillars is left blank. When room No. 6 has been driven 45 ft. (the legal distance) the first crosscut is started. From this, rooms Nos. 7 and 8 are turned, the first from the No. 6 and

## Two Rooms Omitted

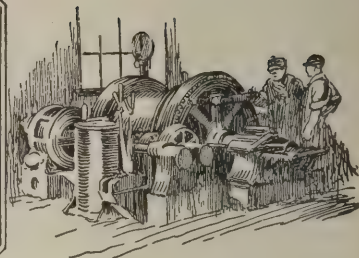
These two-room spaces serve as barrier pillars. They prevent squeezes from occurring, and most of the coal in them can be recovered. With this method the pillars can be slabbled. For these reasons the recovery percentage is high. It will be noted that pillars are staggered thus strengthening adjacent ill-supported areas. Illinois and Indiana have both had much trouble from uncontrolled roof despite the low extractions usually attempted.







## Practical Pointers For Electrical And Mechanical Men



### Present Mine Shop Equipment Used For Factory Repair Work

**New Mining Machinery Requires Special Apparatus for Making Repairs—Large Lathe Adapted to Do Horizontal Boring—  
Pump and Motor-Frame Parts Renewed at Low Costs**

SOME coal companies are favorably located near large towns to which they can send their electrical and mechanical equipment to be repaired; others are not so fortunate and therefore must depend upon their own resources when emergencies arise or whenever some special work must be done. In any event certain repair equipment is always necessary at a mine and, of course, the more machinery in the repair shop, the more independent the mine becomes.

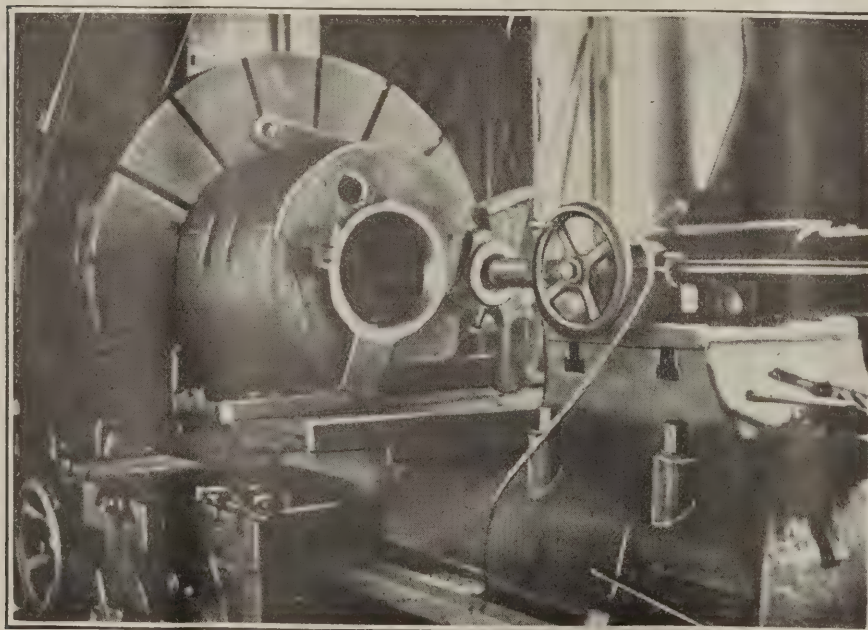
Boring machines are nearly always considered an important part of the equipment of a mine repair shop. However, there are few shops equipped with large boring machines. For years there has not been much demand for large machines of this kind among the coal mines but, since the centrifugal pump has been extensively used, mining men have often had occasion to use such a unit to repair centrifugal-pump casings.

Usually a pump casing or mine-locomotive frame is scrapped as soon

as it has worn to such an extent that the parts no longer fit properly. To avoid such losses and obviate the delays occasioned by placing orders for new parts and awaiting deliveries, the Pennsylvania Coal & Coke Co. found that a large boring machine would soon pay for itself. However, before purchasing the unit the workmen looked around for another way to repair their worn pump and motor parts.

In the repair shop of the company located at Gallitzin, a large lathe has been installed for machining heavy pieces of equipment. Locomotive wheels and pump parts are often machined in this lathe.

Turning to the big lathe the workmen soon converted it into a horizontal boring machine. When repairs are to be made to a centrifugal-pump casing or a locomotive motor frame it is set on the lathe and tools mounted on a shaft driven from the face plate do the cutting, the casing or frame being moved to the tool on a traveling carriage specially designed for this work.



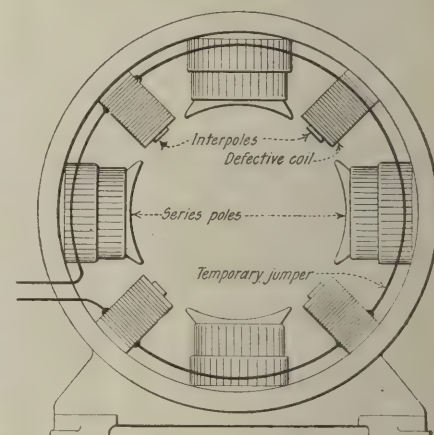
**How Repairs Are Made to a Locomotive Motor Frame**

After the worn parts have been built up by welding, the motor frame is accurately mounted on a traveling carriage. The cutting tool is fastened to a revolving shaft driven by the lathe. Inside cuts are made by moving the motor frame to the revolving tool.

### Series Motor with Shorted Interpole Kept in Service

Sometimes an interpole in a direct-current motor burns out or is grounded, thus putting the motor and the equipment it drives out of service until the winding has been replaced or repaired.

In a case of this kind it is possible to operate series motors, especially on



**Cutting Out an Interpole**

By placing a jumper to carry the current around a defective interpole field coil, a motor may be kept in service the remainder of a working day.

locomotives, by simply connecting a strap or jumper across the defective or removed pole to the remaining adjacent poles, which are still in good condition. No change will be made to the polarity of the remaining poles, it being necessary only to take the defective pole out of service. The above method will lead the current across the removed pole and will cause a slight sparking on the commutator, but it will not prove serious to the operation of the motor under light loads. Motors in this condition should not be run under overload. Of course the defective field should be repaired and placed in position as soon as possible.

R. J. HERMANN.

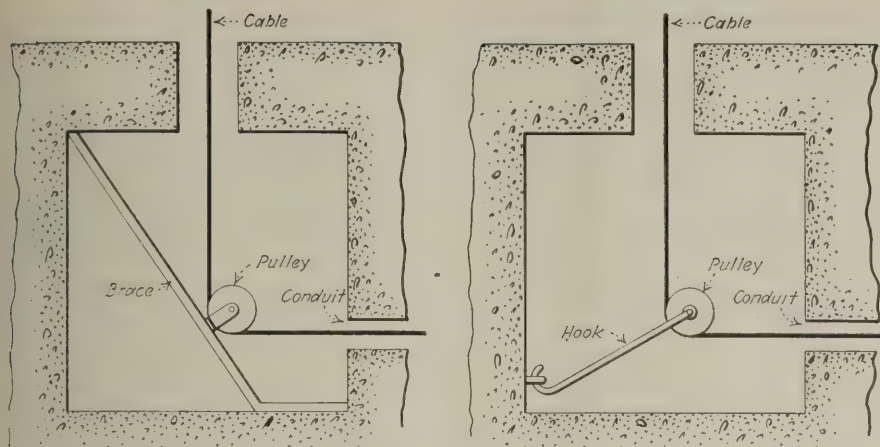
Terre Haute, Ind.

### Pulling Cables into Manholes

Several clever arrangements for pulling electric cables are shown in the accompanying illustrations. One of these sketches shows how special shoring of a heavy beam holding a pulley may be installed. The other illustration shows how a hook may be used. It is obvious that the hook and arm should be long enough so that the pulley will line up somewhere near the center of the conduit.

The necessary pulling power at the





Ways to Pull Cables Through Conduits

Special shoring inside the hole or an iron hook with a pulley may easily be arranged to take the strain of the pulling rope.

mine may easily be obtained from a hoist or locomotive. Special gasoline engines or storage-battery driven de-

vices are also available for this purpose where the hoist must be portable or used without tracks.



Unique Steel Structure

This tower at Donk Bros. mine, Edwardsville, Ill., serves as a guide for the hoisting ropes and an unloading structure. It is fitted with a large crane.

### Rotary Breaks Down Due to Imperfect Foundation

Some few days ago one of the rotary converters operated by our company was reported to be sparking slightly. The attendant noticed that this sparking had gradually increased in severity during a period of about a month.

During heavy loads the brushes on the alternating-current end of the armature threw off fine white sparks, but when the load was low the fire from the rings and brushes practically stopped. After resetting the brushes and polishing the rings the conditions improved but little. The cause of this trouble was a mystery to the attendant.

The other day the armature in this machine burned up. Undoubtedly the sparking at the brushes was a premonitory sign of this accident. Inspection of the damaged machine disclosed no further clew and a spare armature

was installed. As soon as the machine was started it vibrated severely; further investigation revealed the fact that the foundation was loose from the floor of the building.

The cause of the accident no doubt was the vibration of the machine and foundation. Years ago when the rotary was new and the foundation was solid to the floor of the station there was little vibration, but, as years have gone by, parts of the machine are now slightly out of balance and the foundation has proved to be too small.

Little warnings like that given by the sparks at the brushes usually presage trouble, but the cause frequently is ascertained too late.

GEO. MYRICK, JR.

### Tarnish-Resisting Coat for Polished Metal Surfaces

About coal-mine offices, power plants, substations and similar places are frequently many metal surfaces that for the sake of appearance should be kept bright and clean. "Polishing, the bright work" of engines, turbines, boilers and the like is a never-ending job and one that is the bane of the engine tender's existence.

One method of partially avoiding this difficulty consists of polishing the surface that it is desired to keep bright, thoroughly removing all traces of the polishing compound, and then lacquering. Lacquer, however, fre-

quently dulls the luster or bright appearance of the surface upon which it is placed. This is probably due to the fact that to a certain extent it darkens with age.

Another protective coating that may be applied to polished metal surfaces is one of collodion. This dries quickly and is practically transparent. For best results two coats should be applied.

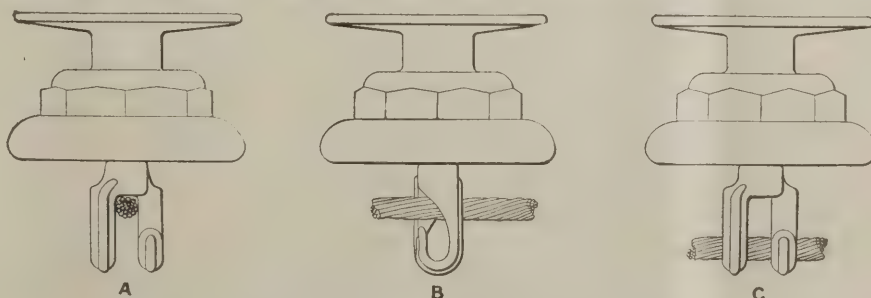
### Holding Feeder Wire from Mine Hanger

Many types of insulators and insulator supports are used in the mines; some are good and some are bad. One of the best types of insulators is the trolley hanger. This device performs its functions under most unfavorable conditions. Often it is mounted on a loose board or a wet roof where the vibration of the trolley wire and the pounding of the trolley wheels combine to cause rust or failure.

In a section of one of our mines, the electrician had been having much trouble with the continued tearing down of the feeder wires, mounted on the side of the gangway. These feeders had been rehung and repaired until most of them were almost bare. This condition made the haulway dangerous, but had new feeders been provided the difficulty would not have been met, for they soon would have been in as bad condition as the old ones. It so happened that an old trolley wire on the side of the road was also used as a feeder. This wire was small and therefore insufficient in itself to carry the total load.

Continual trouble with the feeders on the side of the haulway prompted the electrician to make a change. Looking around he came to the conclusion that the feeders would be much safer and freer from damage if mounted on the roof. The old trolley wire, just mentioned, was mounted on the usual type of mine hangers and after removing the wire and trolley ears the electrician fastened some sister hooks to the hangers as shown in the illustrations. After this was done a heavy feeder was hung on the hooks as shown. The results were unusually satisfactory because no new insulators had to be installed.

As shown in the illustration the hook is turned so that the wire enters between the two prongs. When this is done the hook is turned 90 deg. and the wire dropped into position. The wire is thus locked in place and side strain in any direction cannot pull it out of the hook.



Use of Mine Hanger to Hold Feeder Wire

A, shows an end view with the cable raised in position between the two prongs. B, illustrates a side view of the hook and wire. C, shows the sister hook turned and the wire dropped into position where it is held by the two prongs.



## Discussion

### Saving Time in Gathering Mine Cars

Description of Work of Reel-and-Trolley Locomotive Gathering to Main-Line Locomotive, with Switches for Loads in Inbye Crosscut

BY ALEXANDER BENNETT  
Edwardsville, Ill.

The plan, submitted by Mr. Shacikoski for speeding haulage, in the Aug. 7 issue of *Coal Age*, page 196, is certainly an improvement over the first one mentioned by him, and which he justly criticises as inadequate. Even his remedial method, however, leaves much to be desired, especially where a large tonnage is in prospect. He does not indicate the tonnage obtainable by his revised mine layout and whether it is applicable to a mine that is subject to the generation of dangerous quantities of methane.

My experience has laid wholly in the production of coal where gas is emitted in sufficient quantities to command a wholesome respect. However practicable either of the plans mentioned by Mr. Shacikoski may be in a non-gaseous operation, I am satisfied that neither would be tolerated in any well-regulated gaseous coal mine. This would be particularly true if gas is generated in dangerous quantity, and each panel is sealed off by double concrete walls as soon as the coal is extracted.

I have in mind a mine in which coal is being gathered from the faces, without serious loss of time to either loader or operator. A three-ton car is being used on grades so steep that it is considered to make the use of mules inadvisable, but over which a five-ton reel-and-trolley locomotive can be utilized successfully.

One such locomotive can supply cars to the loaders working after two cutting machines. This, with fourteen men to

each machine, would give an average daily output of 150 tons. The conditions are favorable, with from 6 to 6½ ft. of coal after leaving one foot of top coal in place to protect the roof. The panel system of mining has been adopted.

The accompanying sketch illustrates the method of gathering the coal. Briefly, it is as follows: The haulage locomotive leaves fourteen empty cars on the parting, taking an equal number of loads to the bottom. The gathering motor takes the fourteen empties to the point A, where half of the trip is uncoupled and left. With the other half the gathering machine proceeds to the 1st North and, pushes the cars ahead of it, one empty being dropped into the neck of each room where loaders are working. This is all done in one operation.

The last empty is pushed into the last room to the switch nearest the face. Here the motor couples onto the load and takes it to the entry and up to the next room switch where it is uncoupled. The locomotive then pushes the next empty into the room, up to the switch nearest the face, brings out another load, couples onto the one on the entry, and continues the operation until all seven loads are picked up. These are then pulled out to the point B, at the main-line switch, and left there.

Running light the locomotive then goes to the point A, picks up the other seven empties, backs them into the 1st South, and repeats the same sequence

of operations as in the 1st North but this time leaving the loads at point C. The haulage motor can then pick up both these short trips after its own empties have been thrown in the clear.

With a favorable grade, however, the gathering motor can put all the loads on the parting and save time in switching later on. Each room should be equipped with a latch switch, with heavy latches. The trip-rider should kick this switch open as soon as the loads pass out over it, in those rooms, where loaders are working.

It is necessary to work only one north, and one south entry at a time. In level workings, however, two other machines can operate inside the parting, and the haulage locomotive can pull twenty-eight empties instead of only half this number.

Every successful operation presupposes that those employed shall be "live wires." The plan above outlined is no exception to this rule. The trip-rider and motorman must have average intelligence, and to a reasonable degree must possess the ability to co-operate. They must be predisposed to get maximum results. Where cars are plentiful, doubleheader trips will give still more gratifying results than are attainable by the plan just outlined.

Transportation is today a vital problem in successful coal mining. The sporting instinct, if possible, should be aroused in everyone responsible for the movement of coal toward the shaft bottom. Turn-boards should be placed on each parting where two or more drivers or motormen leave their trips. These should be kept by the trapper or parting tender. Tact and common-sense will do the rest.

### Not Protecting the Fan Duly

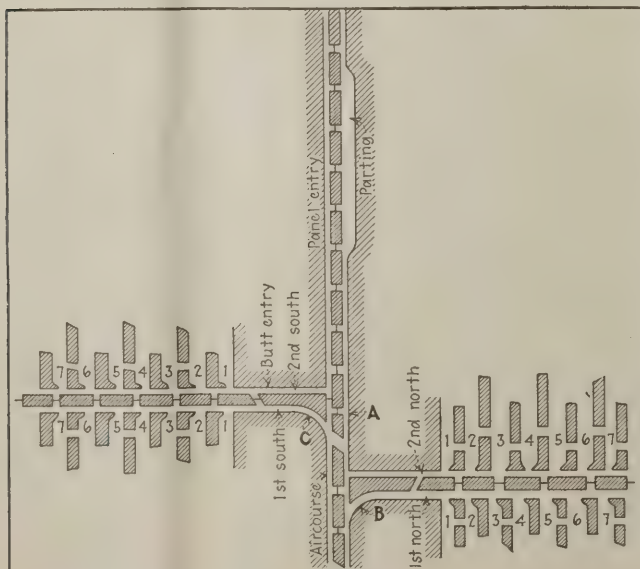
In some recent explosions to which reference has been made in *Coal Age* the fan has been put out of commission, thus delaying rescue work. This makes me wonder whether the practice of placing a relief section on the fan way at the surface is in common use. The fan should be at least 50 ft. from the tunnel and the airway leading to it should be of concrete with a concrete roof, but on the way should be a slight turn if the entrance is by a slope or drift, and the outer angle should embody a wood frame made of light dressed lumber that could be made airtight by placing red lead at the joints. A good coating of paint would preserve the wood.

As the frame is at the outer side at the angle the force of an explosion would be directed at it and the fan saved. In the case of a shaft almost a right angle is made in the airway between the fan and the airshaft, and in this case the wooden framework can be put immediately over the top of the shaft. This opportunity for relieving the pressure could not fail to assist greatly in preventing injury to the fan.

The frame could be readily repaired and the ventilation restored in a few minutes after the arrival of help, especially if the right materials were left on the ground and in proper condition for their replacement.

JAMES GRAY.

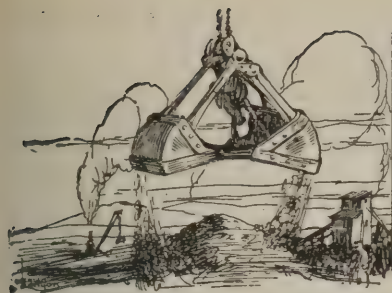
Newcastle, Wash.



### Haulage Layout

By gathering with a locomotive specially engaged in that service delays are avoided and loaders are kept busy, all this without spoiling the ventilation by excessive interconnection. The use of switches in the last crosscut of each room involves some labor and reduces, in a degree, the efficiency of the arrangements. At this particular mine cars have to be delivered to the working face.





# Production And the Market



## Bituminous-Coal Business Begins to Show Signs of General Improvement; Price Gain Holds

Signs of improvement in the bituminous-coal trade are beginning to appear in most of the market centers of the country, apparently reflecting the beginning of the long looked-for beginning of a fall revival in business. This is the most encouraging development in the industry since the recent prolonged depression set in, the betterment being so much broader in character than the previous fitful flurries as to be indicative of lasting qualities. New England, however, continues to be an exception to the tendency toward betterment. Officials of the Pennsylvania R.R. have issued "shop early" advice to coal consumers desiring to be prepared for the cold weather, warning them that shipments are below normal for this time and that consequently there is a likelihood of a car shortage, with the usual attendant evils, unless there be an increase in movement soon. The New York Commissioner of Markets has expressed himself in a similar vein.

### Dawes Plan Holds Hope for Export Trade

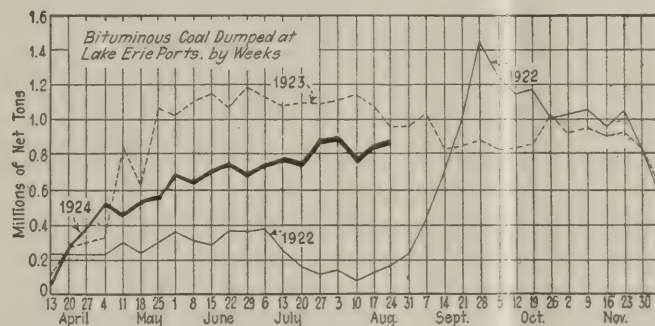
A revival in world trade is forecast by the U. S. Department of Commerce as a result of the adoption by the London conference of the Dawes report, which is hailed as "the greatest effort since the war to bring about economic reorganization in Europe," forecasting a stimulation in exports of American raw materials and the eventual restoration of world markets upon which American producers depend. All of which has an interesting bearing upon the much talked-of plan to build up America's export coal trade.

Coal Age Index of spot prices of bituminous coal continued to maintain the slight advance reported last week, standing on Aug. 25 at 165, the corresponding price being \$2, the same as for the preceding week.

Activities at Hampton Roads showed a pronounced falling off during the week ended Aug. 21, dumpings of coal for all accounts totaling 315,540 net tons, a decrease of 80,028 tons from the previous week.

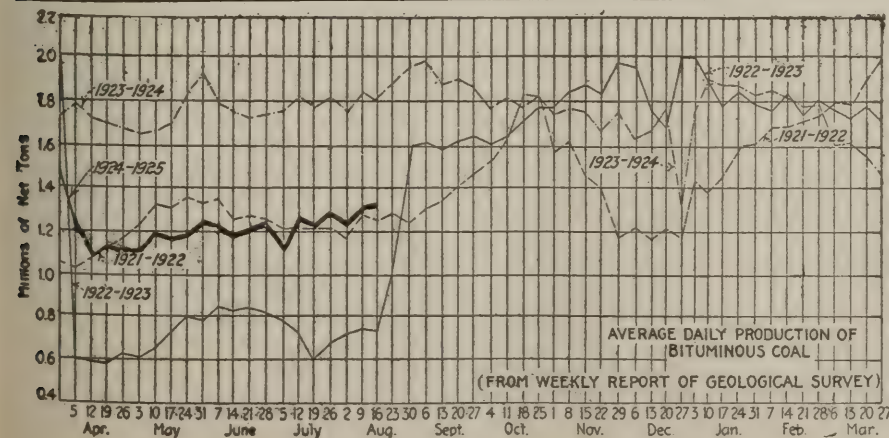
A further upturn marked the movement of coal at the lakes, dumpings during the week ended Aug. 24, according to the Ore & Coal Exchange, being as follows: For cargo, 804,133 net tons; for fuel, 42,021 net tons. This compares with 765,872 and 42,785 net tons respectively for the week before.

Production of bituminous coal again increased slightly during the week ended Aug. 16, the output, according to the Geological Survey, totaling 7,831,000 net tons. This compares with an output of 7,789,000 net tons during the week ended Aug. 9, according to revised figures. Anthracite production, however,



showed a marked falling off, 1,386,000 net tons having been produced during the week ended Aug. 16, compared with 1,664,000 net tons during the preceding week.

Anthracite also showed slight indications of an early upturn, though tangible evidence in the shape of actual orders is still rather meager. Stove coal continues to be the size most in demand, activity being largely confined to independent coals, which for the most part are quoted below company schedule. The larger companies are still working on a schedule of four days a week, but they all expect to be working full time during September.



### Estimates of Production

(Net Tons)			
BITUMINOUS			
	1923	1924	
Aug. 2 .....	10,564,000	7,484,000	
Aug. 9 (a) .....	9,851,000	7,789,000	
Aug. 16 (b) .....	10,843,000	7,831,000	
Daily average .....	1,807,000	1,305,000	
Cal. yr. to date (c) ..	343,229,000	277,504,000	
Daily av. to date .....	1,776,000	1,431,000	
ANTHRACITE			
Aug. 2 .....	2,018,000	1,720,000	
Aug. 9 .....	1,735,000	1,664,000	
Aug. 16 .....	1,858,000	1,386,000	
Cal. yr. to date (c) ..	64,417,000	57,239,000	
COKE			
Aug. 9 (a) .....	326,000	89,000	
Aug. 16 (b) .....	334,000	94,000	
Cal. yr. to date (c) ..	12,473,000	6,763,000	
(a) Revised since last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.			



### Hopes Being Realized in Midwest

The Chicago coal market is beginning to reflect signs of returning industrial activity and prosperity. The country trade in Iowa, Illinois, Minnesota and the two Dakotas is showing signs of renewed activity and it is expected that their inquiries and orders will increase daily from now on. Smokeless coals in the prepared sizes showed a very slight decrease this week, but eastern Kentucky block coal shows very material signs of strengthening. The market on steam coals is in fair shape. The demand has increased a little but the supply remains just about the same as it was about a week ago. There has been a little strengthening in prices on high-grade screenings in southern Illinois. Operators who have coal loaded on track and can furnish car numbers to the big industrials in Chicago are having no difficulty whatever in disposing of their coal.

### Autumn Buying Movement in Kentucky

Sentiment in Louisville is better, indicating better working time at the mines, freer movement of coal and that many mines that have been operating only half time or less are now running fairly close to full time. There has been a notable improvement in demand for prepared sizes,

while prices are stiffening somewhat on prepared, especially block sizes, and screenings are holding their own in eastern Kentucky and increasing a little in western Kentucky, there being good demand in the latter field and better mining conditions.

In eastern Kentucky it is said that there is little block coal to be had at under \$2.40 to the trade, and more operators are asking as high as \$2.75 for top grades. It appears as if the long-awaited fall demand is at hand and that business will be fairly active over the next several months.

The western Kentucky market has been firmer over the past two weeks, but prices may drop soon if the operators resume operations on a non-union basis at the 1917 scale, as it is also asserted that miners will be paid on a production basis of prepared that will run over a 1½-in. screen, in an effort to force miners to quit blowing coal to dust by overshooting it.

### Northwest Markets Getting Stronger

The Duluth market is stronger with slight increases in prices. Anthracite remains the same as last reported, but the demand is increasing, as the last regular 10c. monthly advance goes into effect Sept. 1. Forty cargoes arrived

### Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern		Market Quoted	Aug. 27 1923	Aug. 11 1924	Aug. 18 1924	Aug. 25 1924†
Smokeless lump	Columbus...		\$5.85	\$3.60	\$3.60	\$3.50@ \$3.75
Smokeless mine run	Columbus...		3.00	2.10	2.00	1.85@ 2.15
Smokeless screenings	Columbus...		2.35	1.20	1.20	1.15@ 1.35
Smokeless lump	Chicago...		6.35	3.85	3.85	3.50@ 3.75
Smokeless mine run	Chicago...		3.35	1.85	1.85	1.75@ 2.00
Smokeless lump	Cincinnati...		6.10	3.85	3.85	3.50@ 4.00
Smokeless mine run	Cincinnati...		3.25	1.85	1.85	1.75@ 2.00
Smokeless screenings	Cincinnati...		2.75	1.30	1.35	1.15@ 1.50
*Smokeless mine run	Boston...		5.05	4.20	4.15	4.10@ 4.20
Clearfield mine run	Boston...		2.20	1.90	1.85	1.35@ 2.35
Cambridge mine run	Boston...		2.85	2.25	2.45	2.00@ 2.90
Somerset mine run	Boston...		2.50	2.05	2.10	1.75@ 2.50
Pool 1 (Navy Standard)	New York...		3.25	2.30	2.30	2.50@ 3.25
Pool 1 (Navy Standard)	Philadelphia...		3.10	2.80	2.80	2.35@ 2.50
Pool 1 (Navy Standard)	Baltimore...					
Pool 9 (Super. Low Vol.)	New York...		2.50	2.05	2.05	2.00@ 2.25
Pool 9 (Super. Low Vol.)	Philadelphia...		2.55	2.15	2.15	1.95@ 2.35
Pool 9 (Super. Low Vol.)	Baltimore...		2.50	1.95	1.95	1.90@ 2.00
Pool 10 (H.Gr. Low Vol.)	New York...		2.25	1.95	1.85	1.70@ 2.00
Pool 10 (H.Gr. Low Vol.)	Philadelphia...		2.15	1.75	1.75	1.65@ 1.90
Pool 10 (H.Gr. Low Vol.)	Baltimore...		2.25	1.70	1.70	1.65@ 1.75
Pool 11 (Low Vol.)	New York...		2.00	1.60	1.60	1.50@ 1.75
Pool 11 (Low Vol.)	Philadelphia...		1.80	1.45	1.45	1.35@ 1.60
Pool 11 (Low Vol.)	Baltimore...		1.90	1.55	1.55	1.50@ 1.60
High-Volatile, Eastern						
Pool 24-64 (Gas and St.)	New York...		1.75	1.50	1.50	1.35@ 1.65
Pool 54-64 (Gas and St.)	Philadelphia...		1.80	1.50	1.50	1.40@ 1.60
Pool 54-64 (Gas and St.)	Baltimore...		1.85	1.45	1.45	1.40@ 1.50
Pittsburgh sc'd gas	Pittsburgh...		2.90	2.40	2.40	2.30@ 2.50
Pittsburgh gas mine run	Pittsburgh...		2.45	2.10	2.10	2.00@ 2.25
Pittsburgh mine run (St.)	Pittsburgh...		2.20	1.85	1.85	1.75@ 2.00
Pittsburgh slack (Gas)	Pittsburgh...		1.55	1.30	1.30	1.25@ 1.35
Kanawha lump	Columbus...		3.05	2.10	2.10	2.00@ 2.25
Kanawha mine run	Columbus...		1.85	1.40	1.40	1.30@ 1.55
Kanawha screenings	Columbus...		1.05	1.05	1.05	1.00@ 1.15
W. Va. lump	Cincinnati...		3.50	2.25	2.25	1.85@ 2.25
W. Va. gas mine run	Cincinnati...		1.75	1.45	1.55	1.40@ 1.60
W. Va. steam mine run	Cincinnati...		1.75	1.45	1.40	1.40@ 1.60
W. Va. screenings	Cincinnati...		1.20	.85	.90	.90@ 1.10
Hooking lump	Columbus...		2.75	2.45	2.45	2.25@ 2.55
Hooking mine run	Columbus...		1.85	1.55	1.55	1.45@ 1.65
Hooking screenings	Columbus...		1.10	1.05	1.05	1.00@ 1.15
Pitts. No. 8 lump	Cleveland...		2.65	2.40	2.40	2.00@ 2.85
Pitts. No. 8 mine run	Cleveland...		2.10	1.85	1.85	1.75@ 1.85
Pitts. No. 8 screenings	Cleveland...		1.35	1.20	1.30	1.15@ 1.30
Midwest		Market Quoted	Aug. 27 1923	Aug. 11 1924	Aug. 18 1924	Aug. 25 1924†
Franklin, Ill. lump	Chicago...		\$4.20	\$2.85	\$2.85	\$2.75@ \$3.00
Franklin, Ill. mine run	Chicago...		3.00	2.35	2.35	2.25@ 2.50
Franklin, Ill. screenings	Chicago...		1.65	1.70	1.85	1.75@ 2.00
Central, Ill. lump	Chicago...		2.60	2.50	2.60	2.50@ 2.75
Central, Ill. mine run	Chicago...		2.20	2.10	2.10	2.15@ 2.25
Central, Ill. screenings	Chicago...		1.40	1.60	1.60	1.35@ 1.75
Ind. 4th Vein lump	Chicago...		3.35	2.60	2.75	2.75@ 3.00
Ind. 4th Vein mine run	Chicago...		2.60	2.35	2.35	2.25@ 2.50
Ind. 4th Vein screenings	Chicago...		1.55	1.70	1.80	1.75@ 1.85
Ind. 5th Vein lump	Chicago...		2.75	2.35	2.50	2.40@ 2.65
Ind. 5th Vein mine run	Chicago...		2.10	2.10	2.10	2.00@ 2.25
Ind. 5th Vein screenings	Chicago...		1.40	1.55	1.50	1.40@ 1.65
Mt. Olive lump	St. Louis...		3.00	2.85	2.85	2.75@ 3.00
Mt. Olive mine run	St. Louis...		2.00	2.50	2.50	2.50
Mt. Olive screenings	St. Louis...		1.50	2.00	2.00	2.00
Standard lump	St. Louis...		2.50	2.15	2.15	2.00@ 2.35
Standard mine run	St. Louis...		1.85	1.80	1.80	1.75@ 1.85
Standard screenings	St. Louis...		1.00	1.20	1.20	1.15@ 1.25
West Ky. lump	Louisville...		2.40	2.10	2.20	2.15@ 2.35
West Ky. mine run	Louisville...		2.10	1.60	1.60	1.40@ 1.85
West Ky. screenings	Louisville...		1.05	1.15	1.20	1.25@ 1.35
West Ky. lump	Chicago...		2.75	2.05	2.30	2.15@ 2.45
West Ky. mine run	Chicago...		1.60	1.60	1.55	1.35@ 1.90
South and Southwest						
Big Seam lump	Birmingham...		3.50	3.40	3.40	3.30@ 3.50
Big Seam mine run	Birmingham...		1.95	1.75	1.75	1.50@ 2.00
Big Seam (washed)	Birmingham...		2.35	2.00	2.00	1.75@ 2.25
S. E. Ky. lump	Chicago...		3.10	2.10	2.50	2.50@ 2.75
S. E. Ky. mine run	Chicago...		1.80	1.50	1.60	1.50@ 2.00
S. E. Ky. lump	Louisville...		3.00	2.10	2.10	2.00@ 2.25
S. E. Ky. mine run	Louisville...		1.85	1.55	1.50	1.25@ 1.75
S. E. Ky. screenings	Louisville...		1.10	.95	.95	.85@ 1.10
S. E. Ky. lump	Cincinnati...		3.25	2.35	2.35	2.25@ 2.75
S. E. Ky. mine run	Cincinnati...		1.70	1.45	1.55	1.45@ 1.65
S. E. Ky. screenings	Cincinnati...		1.15	.95	1.00	.90@ 1.15
Kansas lump	Kansas City...		4.50	4.50	4.50	4.50
Kansas mine run	Kansas City...		3.50	3.50	3.50	3.50
Kansas screenings	Kansas City...		2.60	2.50	2.50	2.50

\* Gross tons, f.o.b. vessel, Hampton Roads.

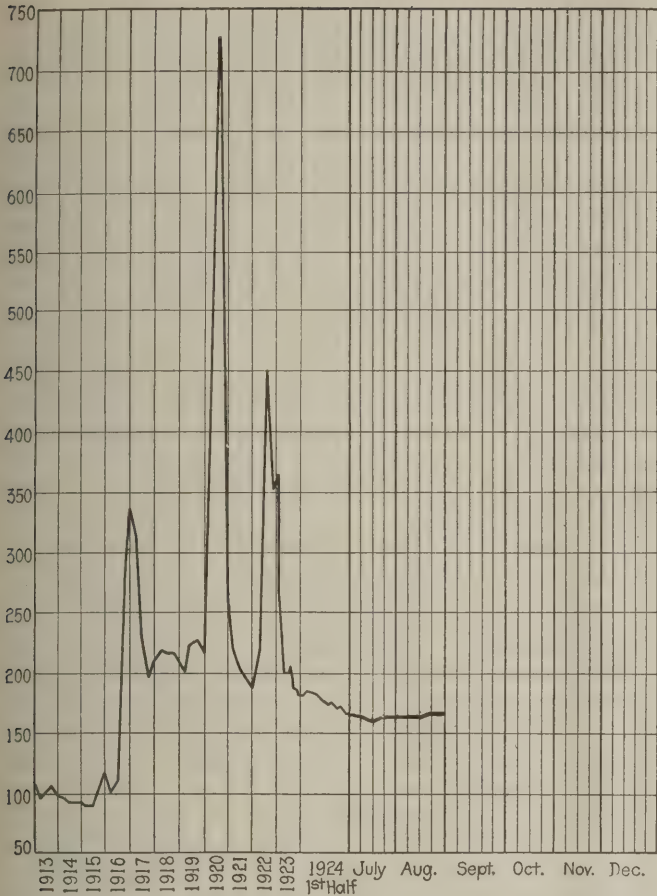
† Advances over previous week shown in heavy type, declines in italics.

### Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

		Market Quoted	Freight Rates	Aug. 27, 1923		Aug. 18, 1924		Aug. 25, 1924†	
				Independent	Company	Independent	Company	Independent	Company
Broken	New York...		\$2.34		\$7.75@ \$8.35		\$8.00@ \$9.10		\$8.00@ \$9.05
Broken	Philadelphia...		2.39		7.90@ 8.10		8.90@ 9.05		8.90@ 9.05
Egg	New York...		2.34	\$8.50@ \$13.00	8.00@ 8.35	\$8.35@ \$8.75	8.65@ 9.10	\$8.50@ \$9.00	8.65@ 9.05
Egg	Philadelphia...		2.39	9.25@ 11.00	8.10@ 8.35	9.00@ 9.70	9.00@ 9.05	9.00@ 9.70	9.00@ 9.05
Egg	Chicago*		5.06	8.50@ 12.00	7.25@ 7.45	8.09@ 8.20	8.03@ 8.10	8.00@ 8.20	8.03@ 8.10
Stove	New York...		2.34	8.50@ 13.50	8.00@ 8.35	9.25@ 9.60	8.65@ 9.45	9.00@ 9.50	8.65@ 9.30
Stove	Philadelphia...		2.39	9.25@ 11.00	8.15@ 8.35	9.35@ 10.00	9.05@ 9.10	9.35@ 10.00	9.05@ 9.10
Stove	Chicago*		5.06	8.50@ 12.00	7.25@ 7.45	8.40@ 8.50	8.43@ 8.53	8.40@ 8.50	8.43@ 8.53
Chestnut	New York...		2.34	8.50@ 13.00	8.00@ 8.35	8.25@ 8.75	8.65@ 9.15	8.50@ 9.00	8.65@ 9.15
Chestnut	Philadelphia...		2.39	9.25@ 11.00	8.15@ 8.35	8.85@ 9.80	9.00@ 9.05	8.85@ 9.80	9.00@ 9.05
Chestnut	Chicago*		5.06	8.50@ 12.00	7.25@ 7.45	8.18@ 8.33	8.28@ 8.34	8.18@ 8.33	8.28@ 8.34
Range	New York...		2.34		8.30		8.90		8.90
Pea	New York...		2.22	6.75 @ 8.50	6.00@ 6.30	4.25@ 5.25	5.75@ 6.00	4.25@ 5.25	5.50@ 6.00
Pea	Philadelphia...		2.14	7.00 @ 7.50	6.15@ 6.20	5.75@ 6.25	5.75@ 6.00	5.75@ 6.25	5.75@ 6.00
Pea	Chicago*		4.79	7.00 @ 8.50	5.30@ 5.65	5.23@ 5.55	5.36@ 5.91	5.23@ 5.55	5.36@ 5.91
Buckwheat No. 1	New York...		2.22	3.50	3.50@ 4.15	2.00@ 2.25	3.00@ 3.15	2.00@ 2.25	3.00@ 3.15
Buckwheat No. 1	Philadelphia...		2.14	3.50	3.50	2.50@ 3.00	3.00	2.50@ 3.00	3.00
Rice	New York...		2.22	2.50	2.50	1.70@ 2.00	2.00@ 2.25	1.75@ 2.00	2.00@ 2.25
Rice	Philadelphia...		2.14	2.50	2.50	2.00@ 2.25	2.25	2.00@ 2.25	2.25
Barley	New York...		2.22	1.50	1.50	1.15@ 1.40	1.50	1.15@ 1.40	1.50
Barley	Philadelphia...		2.14	1.50	1.50	1.50	1.50	1.50	1.50
Birdseye	New York...		2.22		1.60		1.50		1.50

\* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.





Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

	1924			1923
	Aug. 25	Aug. 18	Aug. 11	Aug. 27
Index .....	165	165	163	202
Weighted average price.....	\$2.00	\$2.00	\$1.98	\$2.44

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1924, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board.

last week, of which nine were hard coal, and thirteen are en route, of which three are hard coal. The railroads are giving good dispatch from the docks and unless ordering falls off considerably the docks will not get choked to any marked degree this year. The second cargo of Ford coal has arrived, being 13,000 tons on the steamer Ford 2nd. Announcement has been made that Ford will bring up 200,000 tons this year.

The requirements of the Northern States Power Co. have just been filled, and 200,000 tons of screenings came to the docks here. This was divided among the Pittsburgh Coal Co., the Peter Reiss Coal Co., the Inland Coal Co. and the Berwind Fuel Co. The price was not disclosed.

There has been some pickup in the Twin Cities of late, but it is a good month late, so that deliveries are far below normal for this time. Prices on dock coal remain at recent levels. Southern Illinois coal is on a \$3 basis as before, with little moving to the Northwest as yet. Hard coal is moving to the interior and to some extent to the Twin Cities, but not as much as normal at this date. Yet the crop movement is under way and that should give a return cargo of coal for the cars which bring wheat and other grains to the terminals.

The Milwaukee market is very quiet. A change in the price of anthracite is promised for Sept. 1, when undoubtedly there will be a greater demand than for some time past. Receipts by lake are slow. Thus far this season 445,323 tons of anthracite and 1,139,655 tons of soft coal have been received. Last season up to the same time 552,680 tons of anthracite and 1,735,700 tons of soft coal had been received.

Western Markets Looking Up

A slight improvement in noticeable in the Southwestern market over last week, the operators believing the fall demand actually has started at last. Increased inquiries more than a month ago were thought to presage the opening of the fall market, but there was a setback in the latter part of July and the first half of August, from which the district only now is beginning to recover. Prices hold at recent levels.

The Colorado market continues to drag along, but it is thought that with the heavy movement of crops the railroads will be demanding more coal and a heavy demand for domestic coal is anticipated, as stocks are reported to be low at nearly all points. Colorado mines worked on an average of nineteen hours last week, 50 per cent of the working time lost being due to no market. Prices remain unchanged.

Utah operators have announced a 50c. increase on sizes above 3-in. nut, this size having been reduced 25c. The new schedule will be as follows: Big lump, \$4.50; 3-in. lump, \$4.25; 3x8-in. lump, \$4; 3-in. nut, \$3.25. Run of mine, screen slack and straight slack remain at \$3.50, \$2 and \$1.50 respectively. Lump coal is moving best now, but there is a demand for all sizes. The domestic storage business is better than a year ago, due, it is thought, to the rising market more than anything else. Industrial buying is light.

Ohio Trade Gains in Momentum

Business at Cincinnati shows a gain in momentum with some slight advances in the quotations of southeastern Kentucky firms, and from Elkhorn mines in particular. The smokeless market is not enjoying as good a position as the bituminous, the cause seemingly being the fact that the steady run of business through the summer has kept the yards stocked on the domestic and the lake buyers are still chary about rushing in for any more tonnage. River business remains at the same volume as for weeks past. The attempt to work through Kanawha coals has been a bit disheartening to those who reopened on an open-shop basis.

With domestic trade showing slightly more activity, there has been a slight improvement in demand in Columbus. Pocahontas and other smokeless varieties are selling fairly well and there is also a good demand for splints and Kentucky grades. There is little doing in steam coal and the trade is marking time, so to speak. Reserves are still fairly large in some localities and buying is mostly for immediate needs. While there is not nearly as much demurrage coal on the market as formerly, still cheap cargoes can be picked up and bargain hunters are busy. Utilities and railroads are good consumers. Schools are taking in a good tonnage while there is also considerable activity in coal for municipal departments, hospitals and public institutions. Production is showing slight signs of improvement. The lake trade is not as active as formerly owing to the fact that the wants of the upper lake region are close to being filled.

Trade in eastern Ohio seems to be moving along with a casual but slightly increasing steadiness. Inquiries show more life, especially in the retail trade, and this demand is, no doubt, emanating from apartment houses, schools and the domestic consumer. Steam stocks are now a negligible quantity, and steam buyers are taking advantage of every opportunity to purchase small lots at advantageous prices, thereby augmenting whatever small stock they may have and at the same time providing for current requirements.

Coal Moving Better at Pittsburgh

Pittsburgh district coal has been moving a little better of late. Quotations on Pittsburgh steam and gas coals have not been favorably affected by the heavier call for coal. The movement of domestic coal is still in the incipient stage, there being nothing like a regular tonnage. Buying demand for slack has increased noticeably. The additional quantity is furnished by strip mines producing somewhat more and by there being more from deep mines, partly through increased shipments of domestic lump. Pittsburgh steam mine-run continues quotable at \$1.75@\$2 as the full range of the market, and there has been no distinct change since the decline to this level late in March.

With little or no change in prices, inquiries are becoming



more plentiful in central Pennsylvania, and although to date not much coal is being sold or contracted for, indications point to heavier buying after Sept. 1.

Demand at Buffalo is about as before, but the feeling is somewhat better. Prices are at the bottom and have not changed to any visible extent for quite a long while: \$2.25 @ \$2.50 for Youghiogheny gas lump, \$2 @ \$2.25 for Pittsburgh and No. 8 steam lump, \$1.75 @ \$2 for all mine run, \$1.10 @ \$1.25 for slack.

### New England Sees Further Price Drop

In New England pool 1 New River and Pocahontas declined 15c. to \$5.25 per gross ton on cars, Boston, brought about entirely by competition, for prices for spot tonnage at the southern loading piers have been slightly firmer. Some business has been done in small lots at \$5.40. Consumers' stocks are larger than has been generally believed. In the aggregate quite a fair tonnage has been booked at the low figure, but it is not as large as was anticipated.

The price seems to be sustained at Providence as no really pool 1 mine-run coal is known to be offering under \$5.40 on cars, with some business noted at \$5.45 within the past few days. And orders are no more plentiful than at Boston.

The situation at the southern loading ports is just a bit firmer. There is little strictly pool 1 mine-run coal offering under \$4.10 gross ton, f.o.b. Hampton Roads, now and 5c. and 10c. more is being paid. Some tonnage of pool 1 coal has been shipped to New England in the past fortnight for which the f.o.b. price was under \$4, but this is no longer possible. Tonnage appears to remain rather heavy, but there is less slack standing and this injects a firmer tone to prices.

The all-rail situation offers nothing new. Regular consumers of Pennsylvania coal are taking it right along, but there is practically no spot buying. Prices manifest no change from the past week or so.

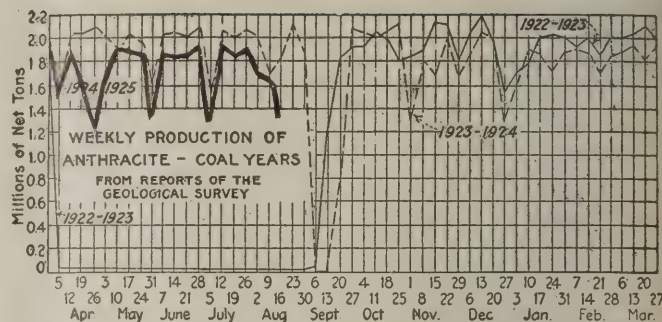
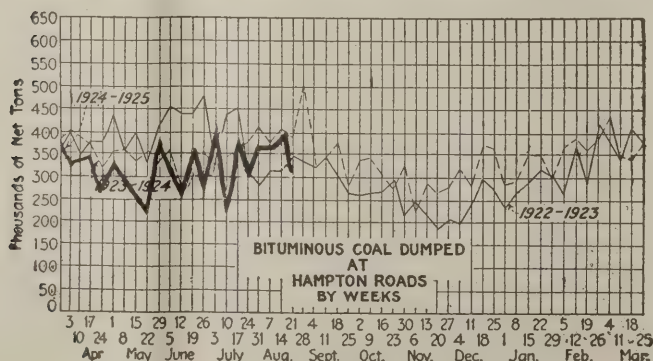
### Encouraging Signs in Atlantic Markets

An encouraging sign in the New York situation is the number of inquiries by large consumers. Confidence is slowly increasing and with general business showing signs of greater activity it is expected that actual buying will soon set in. Reserve stocks are slowly fading. Accumulations at tidewater range between 1,100 and 1,500 cars daily, more than sufficient to meet current requirements and in some instances too large to prevent some buyers from picking up bargains when shippers find it necessary to sell coal to avoid demurrage charges.

Buying at Philadelphia is increasing but spotty, the orders being small. Big buyers are still holding off, but expect to be in the market soon, as general business is picking up. Prices remain on about the same level.

Despite the persistent dullness a note of optimism pervades the Baltimore market. Inquiries are not brisk and spot purchasing is at an extremely low ebb, but the trade is encouraged by reports from various industries that conditions are slowly but surely improving. Another lull has come to the export movement, only one ship having cleared during the past week.

Some improvement is being shown at Birmingham, but progress is slow. Orders are somewhat more plentiful for steam fuel in the open market and consumers are taking to contract making in greater numbers. However, there is no great amount of room for optimism as far as actual business booked is concerned, but the undertone is unmis-



takably healthier and more hopeful and steadily increasing activity is expected from now on. Production for the week of Aug. 9 was 326,000 net tons, showing a fair increase over the previous week, but there has been no improvement in working time at the mines. The iron market is very dull and foundry coke is in a rather quiet position with quotations \$5 @ \$5.25 per ton ovens for 72-hour product.

### Independents Heavily Booked for Hard Coal

Activity in the New York hard-coal market is largely confined to independent coals, which for the most part are quoted below company schedule. The exception is stove coal, which is quoted by some of the smaller operators at slightly above company schedule, especially when taken straight. Many independents are heavily booked for future delivery and some are refusing quotations for immediate delivery. Stove coal continues to lead in demand, some retail dealers complaining of inability to obtain sufficient to meet the demand. However, most buyers are willing to take a share of their order in either egg or chestnut if assured of the other size. Pea coal moves slowly and operators find it difficult to keep their tonnages moving. There are no favorable signs in the steam-coal situation. Buckwheat No. 1 continues the weakest, while barley appears to be the best seller.

Signs of improvement continue in the Philadelphia anthracite trade, mostly in the retail trade, where the dealers report an increase of small orders. The larger companies still maintain a four-day schedule, but they all hope to make full time during September. Stove coal continues to be the size the dealer wants if he asks for anything at all. Nut and pea are plentiful with all shippers. Steam coals have not improved, although there are faint signs that better movement is likely to be in order soon.

A number of Baltimore anthracite dealers report better ordering. Practically all have liberal stocks on hand and they are delivering as quickly as orders are placed. Coal men are urging consumers to take fuel now, pointing out that prices will undoubtedly advance about 25c. Sept. 1.

Buffalo consumers are buying a little better now. Canadian buyers, however, are far behind their usual outlay.

### Not Much Activity in Coke Market

There has been little actual market activity in the past week in the Connellsville coke market, but general conditions show a slight improvement in the outlook. The operators are all firm at \$3.25 for furnace coke except for a few that hold out for still more. Foundry coke has been still duller in the past ten days, but the market is unchanged, at \$4.00 to \$4.50. The *Courier* reports coke production in the Connellsville and Lower Connellsville region in the week ended Aug. 16 at 16,300 tons by the furnace ovens, an increase of 100 tons, and 33,320 tons by the merchant ovens, an increase of 3,200 tons, making a total of 49,620 tons, an increase of 3,300 tons.

### Car Loadings, Surpluses and Shortages

	Cars Loaded	Coal Cars
Week ended Aug. 9, 1924	942,198	149,482
Previous week	945,731	144,865
Week ended Aug. 11, 1923	973,162	177,259

	Surplus Cars	Coal Cars	Car Shortage
Aug. 7, 1924	296,496	138,325	
Previous week	322,530	146,840	
Aug. 8, 1923	74,168	6,546	10,149 4,897



Foreign Market  
And Export News

British Market Subnormal but Steady;  
Output Hard Hit by Holidays

The Welsh steam coal market continued steadier though holidays have interfered with production and the volume of business is anything but satisfactory. The progress made at the Inter-Allied Conference has encouraged buyers abroad and the pressure for supplies has shown a slight increase. French inquiries are better, Italian business is fair, and South America is taking more coal than during the last two months. Supplies are limited owing to the number of collieries that are closed because of the unremunerative prices, the latest stoppage being the large Cambrian collieries. The better grades of coal are firmer, other sizes are plentiful and cheap. The market position is regarded as increasingly serious.

The Newcastle market remains very quiet except for some improvement in the gas coals section. Many collieries are still closed down, some are on short time, and several are being operated on a day-to-day basis, according to the amount of business received. The Amsterdam gas works has taken 30,000 tons of gas coals, and has placed another order for 30,000 tons in Germany at a lower price. The Lithuanian Rys. have placed an order for 30,000 tons at 28s. 6d. per ton, the class of coal not stated. Northumberland coal hewers will undergo a reduction of 9d. per shift this month on account of the June audit.

The output of the British collieries during the week ended Aug. 9, a cable to *Coal Age* states, was 3,446,000 tons, according to the official reports. This compares with 5,010,000 tons during the week ended Aug. 2. The decline in production was due to the observance of the holiday week.

July exports totaled 5,487,889 tons as compared with 6,767,255 tons a year ago. Exports for the first seven months of 1924 amounted to 36,618,946 tons, which is 10,000,000 tons below the figures for the corresponding period of

1923, or 21 per cent reduction this year. This decline was caused by lower shipments to Germany, the Netherlands, Belgium and France.

Trade Slack at Hampton Roads;  
Outlook Lacks Promise

The Hampton Roads market shows little or no change from last week, prices remaining almost the same and tonnage dumped continuing in about the same volume. The Norfolk & Western piers dumped 157,000 tons during the week, and indications were that during the coming week the tonnage would pick up.

Shipments to South America continue to be the outstanding movement, cargoes moving out regularly. Returning ship masters assert that Rio de Janeiro is being stocked with American coal.

The three railroads handling coal at the Roads report business slack with prospects of only small increases, if any, in tonnage.

French Domestic Coal Active;  
Industrial Grades Quiet

Little change is observable in the French coal market, industrial fuel being quiet while house coals are animated and even active; but even in the case of the former stocks are not very important.

Imports from Great Britain are rather weak, buyers holding back owing to the instability of exchange and the prohibitive prices for anthracite grades. Sales of sized coals are few for the present time. Free offers for German coals, outside of indemnity deliveries, are now being made on the Paris market.

The O.R.C.A. was supplied with 39,522 tons Ruhr coke from Aug. 1 to 5, or a daily average of 7,904 tons. Deliveries continue to decline at the re-

quest of French industrialists, impelled by financial considerations on one hand, and lack of room to store supplies on the other. No change in price is foreseen for the present.

The M.I.C.U.M. agreement between the German mine owners and the Franco-Belgian Commission in the Ruhr regarding industrial operations and the making of deliveries in kind by the Germans for the reparation account has been extended until Sept. 23.

Export Clearances, Week Ended  
Aug. 23, 1924

FROM HAMPTON ROADS		Tons
For Brazil:		
Br. Str. W. F. Radcliffe for Rio de Janeiro	7,653	
Am. Str. Corvus for Rio de Janeiro	6,993	
Br. Str. Cornish City for Rio de Janeiro	6,791	
Nor. Str. Hermon for Rio de Janeiro	6,688	
For Canada:		
Am. Schr. Mary G. Maynard for Hamilton	1,046	
Am. Schr. Marguerite M. Wemyss for Hamilton	844	
For Newfoundland:		
Dan. Str. Nordhavet for St. Johns	4,964	
For Cuba:		
Br. Str. Mabay for Sagua	2,262	
Am. Schr. Jennie Flood Keger for Cienfuegos	2,087	
For Italy:		
Ital. Str. Clara for Trieste	2,485	
FROM PHILADELPHIA		
For Canada:		
Br. Schr. Avon Queen for St. John	—	
FROM BALTIMORE		
For Porto Rico:		
Am. Str. Delisle for San Juan	2,285	

Hampton Roads Pier Situation

	Aug. 14	Aug. 21
N. & W. Piers, Lamberts Pt.:		
Cars on hand	1,680	1,051
Tons on hand	103,370	65,827
Tons dumped for week	156,371	157,234
Tonnage waiting	25,000	10,700
Virginian Piers, Sewalls Pt.:		
Cars on hand	1,253	1,797
Tons on hand	94,700	127,000
Tons dumped for week	80,119	53,826
Tonnage waiting	15,880	10,163
C. & O. Piers, Newport News:		
Cars on hand	1,334	1,458
Tons on hand	73,100	79,010
Tons dumped for week	116,696	70,670
Tonnage waiting	5,670	3,285

Pier and Bunker Prices, Gross Tons  
PIERS

	Aug. 16	Aug. 23†
Pool 9, New York	\$5.25@ \$5.40	\$4.50@ \$4.85
Pool 10, New York	4.25@ 4.50	4.35@ 4.65
Pool 11, New York	4.00@ 4.15	4.00@ 4.35
Pool 9, Philadelphia	4.70@ 5.00	4.90@ 5.25
Pool 10, Philadelphia	4.45@ 4.70	4.45@ 4.70
Pool 11, Philadelphia	4.30@ 4.50	4.30@ 4.50
Pool 1, Hamp. Roads	4.15	4.10@ 4.20
Pool 2, Hamp. Roads	4.05	4.00@ 4.10
Pools 5-6-7 Hamp. Rds.	4.00	3.90@ 4.00

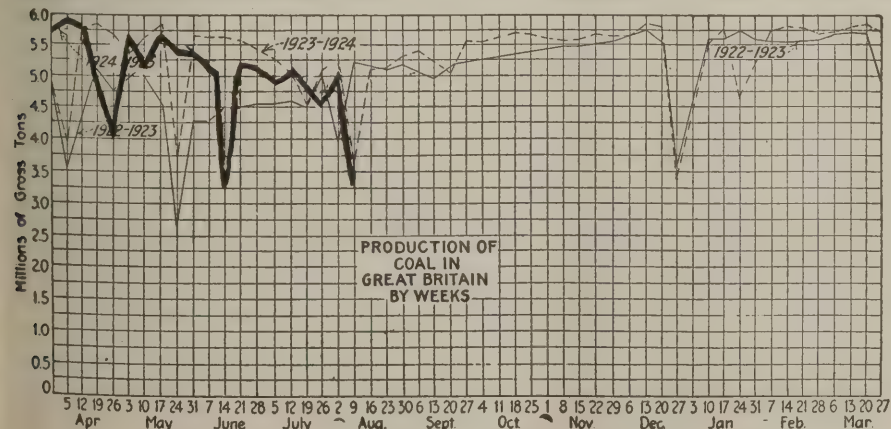
BUNKERS

	Aug. 16	Aug. 23†
Pool 9, New York	5.00@ 5.25	4.75@ 5.10
Pool 10, New York	4.70@ 5.00	4.60@ 4.90
Pool 11, New York	4.50@ 4.75	4.25@ 4.60
Pool 9, Philadelphia	5.00@ 5.30	4.90@ 5.25
Pool 10, Philadelphia	4.75@ 4.95	4.75@ 4.95
Pool 11, Philadelphia	4.50@ 4.70	4.50@ 4.70
Pool 1, Hamp. Roads	4.20	4.10@ 4.20
Pool 2, Hamp. Roads	4.10	4.00@ 4.10
Pools 5-6-7 Hamp. Rds.	4.00	3.90@ 4.00

Current Quotations British Coal f.o.b.  
Port, Gross Tons

Quotations by Cable to <i>Coal Age</i>		
Cardiff:	Aug. 16	Aug. 23†
Admiralty, large	28s. @ 28s. 6d.	29s.
Steam smalls	17s.	17s. @ 17s. 6d.
Newcastle:		
Best steams	22s. @ 22s. 6d.	20s. 9d. @ 21s.
Best gas	22s. @ 22s. 6d.	22s. @ 22s. 6d.
Best bunkers	20s. 6d.	19s. 6d.

† Advances over previous week shown in heavy type, declines in italics.







## News Items From Field and Trade



### ALABAMA

The Sloss-Sheffield Co., of Birmingham, recently placed with the Link-Belt Company, of Chicago, an order for a gondola car dumper. This dumper will be similar to that installed at the Cahokia power station, East St. Louis. The new machine will be required to dump gondola cars of coal of a capacity of 100 tons at the rate of twenty an hour. Only a 19-hp. motor and one man are required for its operation.

According to a statement from John T. Cochrane, president of the Alabama, Tennessee and Northern R.R., with headquarters in Mobile, three surveys recently have been made for a proposed line from Reform, Tuscaloosa County, through Walker County to connect with the St. Louis & San Francisco R.R. at or near Fayette. If this line is built it will afford an outlet to valuable coal fields in Walker County not now served by transportation facilities and will provide a direct short route to the Gulf. It has not been definitely decided that the line will be built or which route it will take if it is constructed.

### ALASKA

Wood as fuel is being replaced by coal at a number of Alaskan mining properties in the Fairbanks region as a result of the development of a well equipped mine on the Healy River. The property is operated by the Healy Coal Corporation. The quality of the coal is described as good. The main haulway now has been completed for distance of 1,100 ft. It is timbered, lagged and muddilled throughout. A new power plant has been installed and electric units to operate the mine on the most economical basis. Sizing equipment also has been installed. This coal also is replacing wood for domestic use in a wide territory along the upper end of the railroad.

### COLORADO

Union mine officials, in a letter to the State Industrial Commission, charge the Bell Mining Co., operating in the northern Colorado coal fields, with making an unauthorized cut in wages. The union officials assert that the company, without authority, reduced wages from \$8 to \$7 a day. The management of the company verbally denied the charges, maintaining that the cut was made in accordance with an agreement made with the Mine Workers when the company took over the properties, May 1. Under terms of the agreement, the management says, it was agreed to pay the same scale in effect at the Eureka

mine, another company working. This scale provided for \$7 a day.

### ILLINOIS

Frank F. Tirre has been appointed general manager of the Mulberry Hill mine of the St. Clair Coal & Mining Co., at Freeburg, and also in charge of sales, with headquarters in the Fullerton Bldg., St. Louis.

In these times of despondency in the coal trade it is unusual in Illinois to learn that coal leases are being taken up, for which reason much surprise has been occasioned by the activities of agents purporting to represent the Crawford Coal Co., of Chicago, who have been leasing acreage in eastern Williamson County, along the Illinois Central R.R.'s Edgewood cutoff.

Railroad building in the Franklin County coal field would seem to indicate an early pick up in the coal industry. The Illinois Central is planning a switch from a point between Benton and Logan to mines Nos. 1 and 2 of the Chicago, Wilmington & Franklin Coal Co., also tapping mine No. 18 of the Industrial Coal Co. at West Frankfort. The Missouri Pacific R.R. will build from half way between Buckner and Benton to mines Nos. 1 and 2. Trains at these mines will be made up as the coal is loaded and a "Joint-road" locomotive will deliver the "trains" to each of the four trunk coal carriers, the Illinois Central, the Missouri Pacific, the Burlington and the C. & E. I.

Richard J. O'Halloran, a coal miner, of Spring Valley, has announced his candidacy for president of the State Labor Federation. "The interests of labor require the entire time of its leaders," says O'Halloran. "In the present campaign John Walker, president of the state Labor Federation, and his group of co-workers devote about 80 per cent of their time working in behalf of Governor Small's re-election. And while the officialdom of the state labor federation is working for Small the interests of 40,000 unemployed coal miners in the state are neglected. Most of these miners don't know where the next meal is coming from." According to O'Halloran he has been promised the support of the state miners and a number of large Chicago unions. The nominations will be held this month and the election in December.

The Lovington Coal Co., successor to the Lovington Coal Mining Co., was organized at a meeting held at Lovington, Aug. 12. The new company starts with more than half of the capital stock of \$100,000 subscribed for on the first day. Old stockholders of the

company which went into bankruptcy, to the number of probably 125, attended the meeting and were given the first chance to subscribe for stock in the new company. At the receivers sale, the old company was sold to George Spitler, acting for a group of the stockholders, for \$5,000, recognized as a nominal price for the property, which represented an investment of a half million dollars and which had paid dividends during the life of the company to the total amount of \$300,000. Directors of the new company were elected as follows: J. A. Vent, Hammond; E. L. Beall, Decatur; R. E. Bowers, Lovington; Daniel Hall, Dement; John Benson, Decatur; George Spitler, Mt. Zion; D. W. Beggs, Decatur. A meeting for the election of officers and for general organization will be held soon.

### INDIANA

The Triangle Coal & Coke Co., Auburn, has reduced its capital from \$25,000 to \$10,000.

Work in the new Deep Vein coal mine, three miles south of Princeton, was resumed recently after it had been shut down for several months for the installation of new equipment. The present force consists of fifty men, but this will be increased as soon as rooms are opened up on the two main entries. The mine is electrically equipped. It is situated on the Chicago & Eastern Illinois R.R. E. J. Smith, of Terre Haute, is president of the company.

Improving conditions in the Indiana coal fields are reflected in the resumption of operations by the McClelland Coal Co., at its mine south of Terre Haute after several months' idleness. Two hundred men have returned to work and within a short time from 50 to 100 more men will be placed at work there. Several of the larger mines in the Terre Haute-Clinton field and in the field south of Terre Haute have resumed operations in the last few weeks, sending many miners, who had been idle for several weeks, back to their work.

Governor Branch has named twenty-one delegates to represent Indiana at the American Mining Congress to be held in Salt Lake City, Utah, Sept. 29 to Oct. 4. The list of delegates is as follows: William Johnson, Vincennes; Harvey Conrad, Bicknell; James Moore, Evansville; Harry Sherburne, Terre Haute; Clem Richards, Terre Haute; Frank A. Kattman, Terre Haute; Richard Thomas, Universal; Norman McClevey, Petersburg; John A. Templeton, Terre Haute; Homer Talley, Terre Haute; Duncan McDill,



Clinton; Ed Shirkie, Terre Haute; W. G. Spears, Terre Haute; George T. Gillson, Universal; John Sieffert, Terre Haute; L. M. VanArsdale, Sullivan; T. I. Roberts, Terre Haute; John Ellison, Winslow; John Oglivie, Bicknell; W. E. Cox, Francisco and H. P. Dyer.

## IOWA

Increased consumption of fuel mined in Iowa to the exclusion of foreign mined coal was urged at a meeting of miners and union officials at Des Moines Aug. 11. Lawrence Love, representing the mine operators, and John P. White, former international president of the mine workers, urged an active campaign to convince householders of the state that it is to their interest to burn Iowa coal. George Baker, head of the farmers' union, pledged the help of the farmers of the state to the movement of the miners. Joe Morris, president of district No. 13, United Mines Workers, and John Gay, secretary of the district, declared the officers and district board would co-operate with the local miners.

## KANSAS

A. C. Ellsworth, who as a member of the Ellsworth-Klaner Coal Co. thirteen years ago pioneered steam-shovel coal mining in the Pittsburg field and more recently has been directing the affairs of the Ellsworth Coal Co., has sold his Pittsburg residence and announced that he will dispose of his coal interests. Mr. Ellsworth will move to Chicago, where he has real estate and other property interests. The Ellsworth company has two large steam-shovel mines near Minden, Mo., in operation and recently acquired a tract of coal land near Bronaugh, Mo.

W. C. Ernhart, superintendent of the Central Coal & Coke Co. mines in the Pittsburg field, resigned, effective Aug. 15, to take a position with an Indiana coal company. He is succeeded by Roscoe H. Reid, who had been assistant superintendent. Mr. Reid entered the

employ of the Central twenty-two years ago as a clerk. The Central operates four large shaft mines and a shovel mine in the Pittsburg field and has a large unworked acreage. It has recently acquired large tracks in Craig County, Oklahoma, adjoining the Kansas border, and will soon develop it. The office of assistant superintendent will be abolished with the promotion of Mr. Reid to the superintendency.

## KENTUCKY

Abner Lunsford, who has charge of the Henry Ford mining interests in West Virginia and Kentucky, when in Cincinnati recently, said that he was so well satisfied with the movement to the Ford coal roads, boats and upper lakes docks that he had given orders to run the Pond Creek Coal Co.'s properties on full time.

The Gatliff Coal Co., of Williamsburg, has increased its capital stock from \$75,000 to \$375,000.

Fire starting in the boiler room of the Norton Coal Mining Co., at Empire, Ky., in Christian County, on Saturday night, Aug. 16, destroyed tippie, boiler room, a loaded gondola, and put the mine out of operation.

J. W. Ailstock has resigned as assistant superintendent of the Youngstown Sheet & Tube Co.'s Rum Creek No. 5 mine, at Dehue, Logan County, W. Va., and is now mine superintendent of the Weeksbury mines of the Elkhorn Piney Coal Mining Co.

Five men were reported to have been killed in the mines of the United States Coal & Coke Co., near Harlan, Ky., on Aug. 18. Three men were crushed to death in a slate fall, a fourth later from injuries received in the fall, while a fifth man was electrocuted in another company mine.

The rapid development of strip mining in Kentucky is shown at Centertown, Ky., where the Morrison Coal Co. is reported to be loading around

600 cars a month, and the Kershaw Mining Co., around 1,000 cars a month. The Dawson Daylight Coal Co., near Dawson, the newest and largest strip operation, has had its first cars set in and has just completed its shovel and equipment, and was reported to be starting operations this week. This mine is on the new Central City-Dawson Springs extension of the Illinois Central R.R., which will be in full operation for its entire length in October.

An order has been issued by Judge A. M. J. Cochran of the U. S. Court of the eastern district of Kentucky for the sale of three mining properties of the Jewett, Bigelow & Brooks group in southeastern Kentucky. As soon as the legal requirements can be met receivers E. L. Douglas and Harry Ritchey have been ordered to sell the properties of the Hazard Jellico Coal Co., the Black Joe Coal Co. and the First Creek Coal Co. All of these are in the Hazard district. The receivers have been handling the properties for about three months.

Tax assessments of five coal companies in Pike County and one in Hopkins County were certified to W. H. Shanks, Auditor of Public Accounts, and to the County Courts by the State Tax Commission. All make considerable raises, Commissioner Wells said. The assessments in Pike County: Edgewater Coal Co., \$577,592; Big Sandy Co., \$1,225,010; Consolidated Coal Co., \$1,028,167; Colony Coal & Coke Co., \$393,610; Fordston Coal Co., \$2,975,028. The St. Bernard Mining Co., Hopkins County property was valued at \$2,393,497.

## MINNESOTA

Bids were opened last week by the City and County Board of Control in St. Paul for furnishing coal for the county poor farm and for the Ancker city hospital. The low bid for the hospital for 2-in. Indiana screenings was that of the North Western Fuel Co., St. Paul, at \$5.15 delivered, while the C. Reiss Coal Co. was low for Hocking screenings at \$5.60. For the county home, the M. A. Hanna Coal Co. was low for 2-in. Indiana screenings at \$4.60 and the Northwestern Fuel Co. for Hocking screenings at \$5.15.

## MISSOURI

The miners' union and coal operators of the Fulton district have reached an agreement on prices for the next fiscal year, the miners setting a price of 8c. a bushel for mine run and 9c. a bushel for screened coal. Contracts on this basis are being signed.

## NEW YORK

Sealed proposals will be opened by the Superintendent of Lighthouses, Staten Island, N. Y., 2 p.m., Sept. 2, 1924, for approximately 1,800 tons of bituminous coal in quantities as required during October, November, and December, delivered and trimmed into vessel's bunkers under contractor's coal chute, New York Harbor. Information upon application.



Courtesy U. S. Distributing Corp.

### Seams of Mammoth Thickness Are Found in Wyoming

This scene is in No. 45 mine of the Sheridan-Wyoming Coal Co., at Monarch, Wyo. The height of the topping is almost as great as the depth of the car from upper edge to car bottom.



Coal dealers docking their barges at the municipal docks in the City of New York will have to pay an increase of about 1c. per ton if the new wharfage rates proposed by Dock Commissioner Michael Cosgrove become effective. The proposed rates show practically a uniform increase of 100 per cent above the existing schedule and, according to Commissioner Cosgrove, will be the first general revision since 1870. The new rates propose a charge of 1c. a running foot with a minimum charge of \$1 for boats transporting coal docking at bulkheads or unshedded piers. For boats docking at shedded piers the charge will be 2c. a running foot, with a minimum charge of \$2.

## OHIO

The receivers of the Maynard Coal Co., Columbus, have appointed A. L. Allais, of Chicago, manager of their eastern Kentucky properties in the Hazard field. Two of the mines use Lennut, as their shipping point, the third, Heiner. Mr. Allais has been authorized by the receivers to make all repairs necessary for the immediate opening of the three operations and it is expected that within the course of the next week or so the mines will be running again. Mr. Allais is president of the Columbus Mining Co., with headquarters in the McCormick Building, Chicago, operating four mines adjacent to the Maynard properties in the Hazard field. The Columbus Mining Co., will market the output of the Maynard properties.

## OKLAHOMA

The strip pit of the Pine Mountain mine at Heavener is installing machinery costing \$250,000. A steam shovel equipped with electric lights, so that it may be worked night and day, is a feature. A specially constructed shovel for loading coal also is to be installed. A rotary dump and cars of 5 cu.yd. capacity have been purchased. The tipples will be equipped with a scraper line conveyor which takes the coal from the rotary dump hopper to the shaking screens, where the different sizes will be separated, and then to the 40-ft. loading booms and dumped in freight cars. An 18-ton dinky engine will furnish power.

## PENNSYLVANIA

Pennsylvania State College will start in the autumn a new optional course for students desiring special training in coal-mine engineering.

The two big mines of the Mather Coal Co., at Mather, Greene County, which had been closed for six months, resumed two weeks ago with the expectation of producing about 9,000 tons daily by the end of the week.

The Scotch Valley mines, near Mt. Grove, between Berwick and Bloomsburg, will soon resume operations and 200 men who have been out of work since last December will be put on their old jobs. Work on the new \$100,000 breaker to replace the one burned during the strike last December is being rushed and it is expected that the plant

will be ready for the preparation of coal early in November. The new breaker will have a capacity between 600 and 800 tons of coal a day.

The Buckeye Coal Co. has resumed 75 per cent activity at its mine at Nemaquin, ten miles east of Waynesburg, Greene County. Its first day's production was 2,500 tons, but it expects to have full production of 5,000 tons daily by Sept. 1, with the completion of a skip shaft. The mine had been closed since June 4.

Many workers who left the anthracite fields during the suspension of 1923 and located in New England cities and towns are returning because of industrial conditions, employment agents report. There has been some retrenchment in the hard-coal collieries, but it is predicted they will be operated on full time soon. Some of the small mines have been closed or workers have been laid off on account of a drop in demand for the steam sizes of fuel.

The British Government has shipped to Pittsburgh half a ton of its permitted explosives, which will be tested by the Bureau of Mines.

Maderia, Hill & Co., of Philadelphia, owners of several large anthracite-producing mines, have purchased the Buck Ridge Colliery near Shamokin. The mine has been shut down since last December, when the Buck Ridge Coal Co., which formerly operated the mine, was forced to ask for a receivership. The new owners have issued orders for a resumption of work. The colliery, during normal operation, gives employment to 400 men.

M. R. Campbell and W. T. Thom, of the Geological Survey, have been doing geological work in the Lykens Valley region of the anthracite field.

## UTAH

The Oregon Short Line Ry., which maintains large offices in Salt Lake City, will construct a line to the Brown Bear coal mine in Teton County, Idaho.

Two noteworthy tipples are now under construction in the Utah coal fields, each of which represents an investment of more than \$200,000. The United States Fuel Co. is erecting a five-tracker at Hiawatha which should go into service this autumn and the Spring Canyon Coal Co. is about to erect one at its Storrs mine. Both tipples, especially that at Storrs, will be equipped to supply the latest refinements of coal preparation.

## WEST VIRGINIA

Fire of unknown origin on Aug. 12 caused "several thousand dollars" damage in the Putney mine of the Campbells Creek Coal Co., Putney, according to M. V. Rensford, general manager.

The Super Fuel Co. is being formed by O. Proelss and others at Moundsville, W. Va., with a capital stock of \$100,000, about \$40,000 of which has been subscribed by the officers of the Franklin Coal Co., of West Virginia. The contract for the erection of a plant at which the sulphur will be separated from the fuel part of coal has been

awarded to the Pittsburgh Super Fuel Co. and the new plant is to be ready for operation some time in December. The plant will employ about 200 men. O. Proelss will have charge of the new plant.

With a view to building three miles of railroad from Henlawson to the mines of the Merrill Coal Mines, Inc. in Logan County, the Little Creek Railroad Co. has been organized with a capital stock of \$400,000. Active in organizing this company were C. V. Jones, F. M. Livezey, S. S. McNeer, J. F. Eaton and M. L. Burnett, all of Huntington.

## WYOMING

A. J. Collier has mapped the Buffalo anticline in Sweetwater County for the U. S. Geological Survey.

P. J. Quealy, head of the Kemmerer Coal Co., of Kemmerer, was originally slated to be one of the committee which formally notified John W. Davis of Clarksburg, W. Va., of Mr. Davis' nomination by the Democratic party for the Presidency of the United States. Mr. Quealy was slightly indisposed, however, and did not go East.

## CANADA

J. F. Soward, of the John Soward Coal Co., of Kingston, Ont., has returned from Scotland, where he purchased a new steamer for the lake coal trade. The boat, which was built in Glasgow, has arrived at her dock in Kingston.

James Smith, of Edmonton, has been appointed by James Murdock, Federal Minister of Labor, chairman of the board of conciliation to investigate the dispute between the operators and men in the Edmonton coal field. R. J. Drinnan will represent the operators and P. J. Rowe the employees.

## New Companies

**The Mender-Patton Coal Co.**, Nelsonville, Ohio, has been incorporated, with a capital of \$10,000, by William Patton and E. D. Mender.

**The Martins Ferry Coal Co.**, Martins Ferry, Ohio, has been incorporated by J. D. Hall and Lenora Boyers. The company has a capital of \$10,000.

Articles of incorporation for the **Medicine Lake Coal & Clay Co.**, in Sheridan County, Montana, have been filed with County Clerk and Recorder Verne Johnson. The location is section 16, township 32 north, range 55 east. Headquarters will be in the town of Medicine Lake. Capital stock is listed at \$100,000, the three directors being R. P. Jones, of Medicine Lake, T. H. Class and John O'Boyle, of Billings.

**The Cornelius Coal & Mining Co.**, Vincennes, Ind., has been incorporated with a capital of \$25,000. The directors are: James H. Cornelius, Homer L. Oliphant and A. J. Marks.

**The Kentucky Coal Distributing Corporation**, Evarts, Ky., capital \$10,000, has been chartered by W. B. Smith, O. H. Wood and W. C. Turner.

**The Barnett Fuel Co.** has been incorporated in Kansas City, Mo., with a capital stock of \$25,000, by Max Barnett, David R. Derge and Alton Gumbiner, and has opened headquarters in the Gloyd building.

**The Cass Coal Co.** has been incorporated at Cass, Ind., for the purpose of prospecting for coal and clays. The incorporators are: Charles Arthur, Charles Scammehorn, Earl Cox, Jesse Daniels and William Thompson.



## Traffic News

### Recommends Revised Rates from Colorado and New Mexico

The Colorado & New Mexico Coal Operators' Association was upheld by Examiner Koebel, of the Interstate Commerce Commission, Aug. 18, in its contention that the rate structure on coal, including anthracite, bituminous and lignite, was unreasonable and prejudicial and preferential to competing coal-producing districts of other states. The complainants operate coal mines in Colorado and northern New Mexico and sought a revision of rates on coal in carloads to Missouri River points and destinations in western South Dakota, Nebraska and Kansas.

Examiner Koebel recommended a revision of the present rate structure to the commission.

### Rate Boost by C. & O. Suspended

Proposals of the Chesapeake & Ohio Ry. to increase the westbound rates and reduce the eastbound rates on bituminous coal, carloads, moving between stations in West Virginia, north of Belva, were ordered suspended by the Interstate Commerce Commission Aug. 22. Pending an investigation by the commission the carrier's proposals have been suspended from Aug. 25 until Dec. 23 next.

## Recent Patents

**Apparatus for Washing Coal;** 1,477,955. René A. Henry, Liege, Belgium. Dec. 18, 1923. Filed Dec. 31, 1919; serial No. 348,672.

**Coal Cutting and Loading Machine;** 1,478,280. Francis K. Holmsted, Charleston, W. Va. Dec. 18, 1923. Filed Jan. 3, 1920; serial No. 349,210.

**Coal Cutting and Loading Machine;** 1,478,281. Francis K. Holmsted, Charleston, W. Va. Dec. 18, 1923. Filed Oct. 3, 1922; serial No. 592,057.

**Miner's Kit;** 1,478,296. W. K. Peters and Alex Foster, Freeman, W. Va. Dec. 18, 1923. Filed Feb. 2, 1922; serial No. 533,534.

**Mine-Air Stop;** 1,478,303. Stephen H. Snyder, West Pittston, Pa. Dec. 18, 1923. Filed April 5, 1922; serial No. 549,947.

**Mine-Door Operating Mechanism;** 1,478,970. Hugh G. Liggett, Roy Peterson and Sherman W. Liggett, Sallineville, Ohio. Dec. 25, 1923. Filed May 27, 1922; serial No. 546,022.

**Coal-Loading Machine.** Mike Persech, Walsen, Colo.; 1,481,737. Jan. 22, 1924. Filed April 6, 1922; Serial No. 550,047.

**Aerial Tramway System.** Edward H. Sackett, Arvada, Colo.; 1,481,746. Jan. 22, 1924. Filed June 26, 1922; serial No. 570,921.

**Mining System and Apparatus.** Edmund C. Morgan, New York, N. Y., Olive E. Morgan, executrix of Edmund C. Morgan, deceased; 1,481,875. Jan. 29, 1924. Filed Dec. 23, 1919; serial No. 346,902.

**Tool for Handling Blasting Caps.** Elmer Dial, Mill Run, Pa.; 1,482,184. Jan. 29, 1924. Filed May 25, 1923; serial No. 641,363.

**Automatic Mine Pump.** Chester Lewis, Hazard, Ky.; 1,482,238. Jan. 29, 1924. Filed Dec. 30, 1922; serial No. 609,974.

**Rubble for Low-Temperature Coal Distillation Purposes.** Edward Barrs, London, England; 1,482,342. Jan. 29, 1924. Filed Dec. 19, 1921; serial No. 593,561.

**Tie for Mine Tracks.** Edward A. Booher, West Austintown, Ohio; 1,479,531. Jan. 1, 1924. Filed July 28, 1923; serial No. 654,390.

**Jig-Pan Supporting and Vibrating Means.** George W. Wilmot, Hazleton, Pa., assignor

to Wilmot Engineering Co., Hazleton, Pa.; 1,479,573. Jan. 1, 1924. Filed Nov. 10, 1921; serial No. 514,164.

**Lamp Holder for Miners' Caps;** 1,485,842. James J. Fisher, Austen, West Va. March 4, 1924. Filed Aug. 23, 1922; serial No. 583,809.

**Rotary-Dump Feeder Mechanism;** 1,486,104. James A. Nolan, Bowerston, Ohio. March 4, 1924. Filed Aug. 7, 1922; serial No. 580,260.

## Obituary

**"Dutch" Bowling**, superintendent of the Cardiff Pocahontas Coal Co., of Lexington Ky., was killed near Bluefield, W. Va., on Aug. 13, when his auto was sideswiped by another machine, causing Bowling's machine to plunge over an embankment into Tug River, death being instantaneous.

**Edwin Thomas**, identified for years with the iron and coal industries in the Lehigh Valley, Pennsylvania, died Aug. 17, at his home in Catasauqua, Pa. He was president of the Pioneer Mining & Manufacturing Co., of Birmingham, Ala., before that concern was taken over by the Republic Iron & Steel Co. Mr. Thomas was 70 years old.

**Charles Oliver**, 68 years old, of Paonia, Col., a retired mine operator, died in Pueblo, Col., recently. He was a pioneer resident of Colorado, having gone to that state in 1879. He leaves his widow, Mrs. Mary Oliver, of Paonia; a brother, Alexander Oliver, of Alamosa, Col.; a son, Curtis L. Oliver, and two daughters, Mrs. C. D. Hailey, and Mrs. E. T. Morgan of Maywood, Ill.

**Dover Williams**, 50 years of age, brother of John W. Williams, well known Knoxville (Tenn.) operator, and himself active in the Harlan (Ky.) fields for a number of years, died at Fountain City, Tenn., Aug. 15. He was an assistant to K. U. Meguire in Harlan County for some years as superintendent of the Lick Branch Coal Co., lessee of the Harlan Coal Mining Co., of which K. U. Meguire was president. For years he was active at Harlan and Coxton. More recently he had been in charge of mining operations at Summitt, Ky., for a rock asphalt company. A widow, son and two daughters survive.

**William D. Walbridge**, coal operator and authority on bituminous coal mining, died Aug. 8, funeral services being held Aug. 10, at his home in Shrewsbury, N. J. Mr. Walbridge was president of the Pulaski Anthracite Coal Co. and the Delparin Anthracite Briquet Co., having retired from the presidency of the American, Kentucky Block and other coal companies. He was born at Toledo, Ohio, in 1856, a son of the Rev. Henry B. and Helen Chase Walbridge, his mother being a sister of the late Chief Justice Salmon P. Chase. His wife, formerly Mary Southwick, of Albany, and a daughter, survive.

## Coming Meetings

**New York State Coal Merchants Association, Inc.**, 14th annual convention, Sept. 4-6, Stamford-in-the-Catskills, N. Y.; headquarters Churchill Hall. Executive secretary, G. W. F. Woodside, Arkay Building, Albany, N. Y.

**American Chemical Society.** Fall convention Sept. 8-11, 1924, at Ithaca, N. Y. Secretary Gas and Fuel Section, O. O. Malleis, the Koppers Co., Pittsburgh, Pa.

**Oklahoma Coal Operators' Association.** Annual meeting Sept. 11, 1924, McAlester, Okla. Secretary, A. C. Casey, McAlester, Okla.

**Association of Iron and Steel Electrical Engineers.** Annual meeting and exposition at Duquesne Garden, Pittsburgh, Pa., Sept. 15-20. Secretary, John F. Kelly, 1007 Empire Bldg., Pittsburgh, Pa.

**National Safety Council.** Thirteenth annual safety congress Sept. 29 to Oct. 3, Louisville, Ky. Managing director and secretary, W. H. Cameron, 168 N. Michigan Ave., Chicago, Ill.

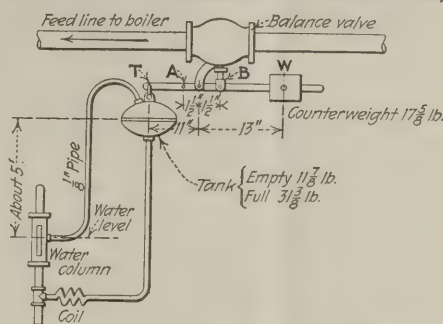
**American Institute of Mining and Metallurgical Engineers.** Fall meeting, Birmingham, Ala., Oct. 13-15. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

**American Institute of Electrical Engineers.** Fall convention, Pasadena, Calif., Oct. 13-17. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

## New Equipment

### Device Keeps Boiler Water At Fixed Level

To keep water in a boiler at any given level the Cooperative Utilities Co., 1014-15 Harrison Building, Philadelphia, Pa., has provided a feed-water regulator, both simple and practical. When the water rises in the water column to the level of a small pipe, steam ceases to flow through the pipe to a small tank, which weighs empty about 12 lb. and full of water about 32 lb. When the stream is thus shut off,



### Feed-Water Automatically Regulated

The float-like tank fills with water when the water is high and so falls pushing up a valve on the other end of a lever. This shuts off feed.

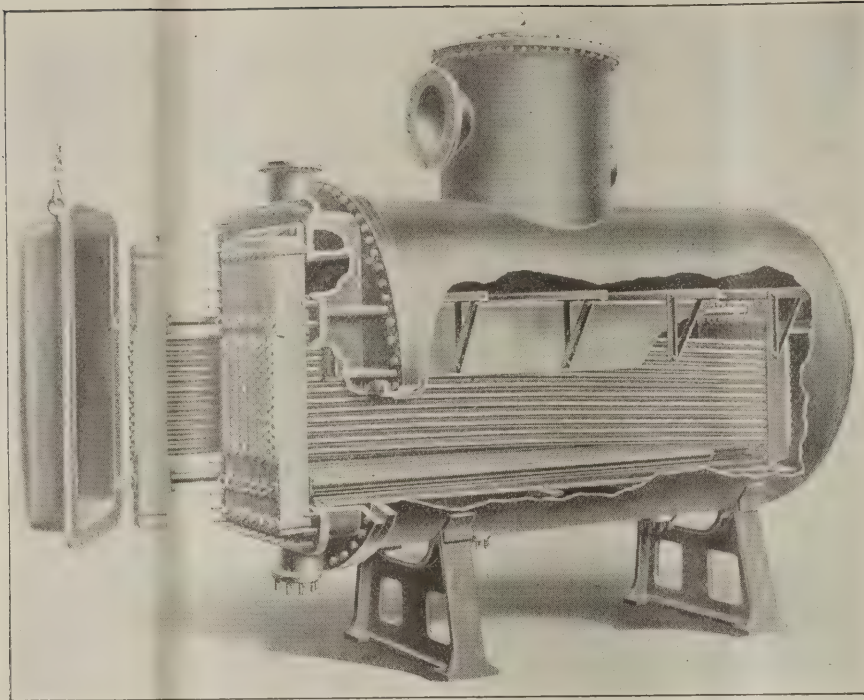
that which is already in the tank and pipe condenses and the water is forced from the column up the pipe and into the tank. The tank is suspended from a lever TW at T, a counterweight being hung at W and the fulcrum being at A. When, owing to the increased weight of the tank, it descends lifting the counterweight, it raises the stem B of the balanced valve in the feed line and thus shuts off the flow of water to the boiler. As soon as the water in the boiler drops, the water flows out of the small tank, steam taking its place. The tank is thus made light and the counterweight accordingly falls pulling down the stem of the balanced valve and thus restarting the flow of water to the boiler. Thus the water is kept at a constant level.

### Frees Boiler from Scale And Keeps Itself Clean

Pure distilled makeup water enables boilers to be run without scaling, makes boilers efficient in operation and enables them to be run without being blown off or shut down for repairs. Equipment known as the G. R. Bentube Evaporator has been placed on the market by the Griscom-Russell Co., 90 West St., N. Y. It has self-scaling heating tubes widely spaced which carry steam through the evaporator and vaporize the raw water in the shell. These tubes being bent distort with temperature changes and effectively crack off accumulated scale.

The tubes being fully submerged give the heating surface maximum efficiency, prevent superheated vapor, the baking





**Bentube Evaporator for Makeup Water**

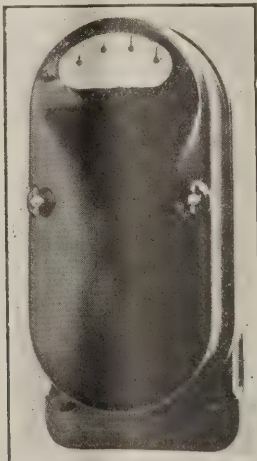
When water is used again and again, efforts spent in keeping the little water clean that the boiler requires to replenish its losses, result in great boiler efficiency. The bent tubes in this evaporator buckle when heated, break off the scale and keep clean and pervious to the heat of the steam passing through the tubes.

of scale on the tubes and the formation of corrosive gases. Ample room is provided for the removal of accumulated scale at the bottom of the shell. The heating surface is sloped for the

free drainage of condensed steam. The tube bundle consists of a series of independent vertical sections, each easily removable for inspection. The shell and vapor dome are of welded steel plate.

### Unusually Small and Light Watt-Hour Meter

A new service type of direct-current watt-hour meter has been placed on the market by the General Electric Co. This meter is much smaller and lighter in weight than the present type. In addition to its reduced size and weight, other outstanding features are a thin cast alloy back or base; bottom con-



**Small Direct Current Meter**

nections with separate terminal compartment and removable terminals, and the same damping magnets and register as used on standard service type alternating-current meters, together with armature and shunt field

coil similar to those used in a previous type.

### Primer for Steel Surfaces

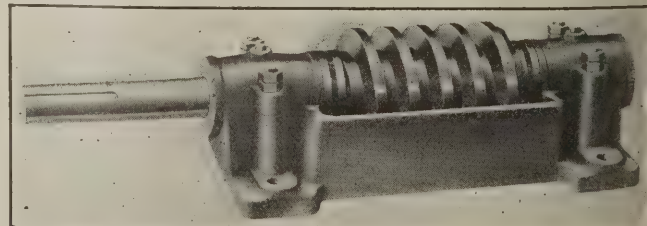
A new paint known as Dixon's Red Lead-Graphite Primer recently has been placed on the market by the Joseph Dixon Crucible Co., of Jersey City, N. J. For over a year this product has been under test by practical painters and has been found to meet the most rigid requirements.

Flake silica-graphite, red lead and a high-grade oxide of iron make up the pigment of this paint. The vehicle is boiled linseed oil. This primer will thus dry under normal conditions in about 22 hr.

It has been the design in making this paint to combine the desirable qualities of red lead with the water-repellant characteristics of silica-graphite. In application both the drag on the painter's arm and the wear on the brush are less than where straight red lead is used. Furthermore, this product will not chip or scale off, has greater covering power than red lead and is appreciably cheaper. It thus

### Semi-Closed Worm Box

These units are constructed so as to take any of the standard size worms made by this company.

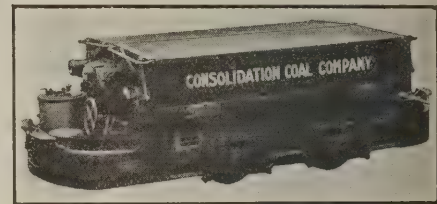


meets the needs of those who desire to use a red-lead paint as a primer.

### Permissible Locomotive Has Approval of Bureau

The Bureau of Mines, has approved as permissible for use in gaseous mines a storage-battery gathering locomotive built by the Mancha Storage Battery Locomotive Co., St. Louis.

The locomotive has single-end control and has a single motor with worm drive for each axle. Its weight complete is from 7 to 8 tons. The same type of headlight, headlight switch and headlight fuse compartments are used on both locomotives. The motor on these locomotives was made somewhat larger than formerly was used for the same weight, and the capacity of the resistance has been considerably increased. The new controller is more



**Approved Battery Locomotive**

readily accessible than the one on the first locomotive built by this company and approved by the Bureau. The casings of the main three-way fuses have an insulating liner with greater clearances inside. The ampere-hour meter is housed in an explosion-proof casing and is insulated from the casing.

The motor, controller, resistance, main fuse box, headlight, headlight switch and headlight fuse box and ampere-hour meter housing were judged to conform to the requirements established for testing storage-battery locomotives for use in gaseous mines.

### Housing Takes the Thrust In Either Direction

A double-thrust worm box has just been placed on the market by the W. A. Jones Foundry & Machine Co., of Chicago. It provides an accurate and rigid support for the worm shaft and holds a liberal supply of oil in which the worm operates. Finished thrust washers are provided at both ends of the worm. They consist of two steel and one hard fiber washer placed in the center. The bearings are babbitted and faced on the ends. These boxes are now made in standard sizes to suit the standard-cut steel worms made by this company. These boxes are recommended for use with open worm-gear drives when something less expensive is demanded.



# COAL AGE

McGraw-Hill Company, Inc.  
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Devoted to the Operating, Technical and Business  
Problems of the Coal-Mining Industry

R. Dawson Hall  
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Number 10

## Not Being Sure, Be Careful

STATIC electrical charges of rather high voltage are sometimes generated by leaks in steam and air lines. These charges are equalized by sparks jumping from the charged cloud of steam or atmosphere near the leak. Such discharges or so-called sparks may be several inches in length and even though of static origin conceivably might ignite an explosive mixture of gas and air. We are not too sure yet that no static discharges or mechanical sparks will ignite methane, and it is well still to act cautiously lest in a gassy mine, where compressed air or steam is used to the exclusion of all electricity, fire, or explosions may be caused by steam or air leaks. There is only one reasonably safe procedure: Do not allow an accumulation of gas in any place at any time.

## Better Mines, the Only Hope

WITH the proposed issue of the Dominion Coal Co. of \$15,000,000 in securities, and with the visit of George S. Rice to the mines of the company, the public is assured that the British Empire Steel Corporation does not intend to have its subsidiary meet the present low prices with inaction. Some companies have done this. One cannot commend their action. Most of them are up and doing, realizing that coal mining is not going to continue in the old rut but is going to have a renaissance.

We are unwilling to admit that coal mining is an unprogressive industry. It has made wonderful progress in recent years, but the next decade is going to see an accelerated movement, and those that lag behind soon will have to drop out of the race. The walk is going to change to a dog trot and the dog trot to a run in the next few years. The railroad industry is merely becoming more efficient, but the coal operator is not only handling recent equipment more effectively, but is reaching out for new methods. Some are sending men to Europe to see what the mines of that continent may afford.

## Canadian Competition

DESPITE the newness of Canadian coal enterprises—excluding in this reference those of Nova Scotia and perhaps Vancouver Island—the nearness of the seams to the surface, the opportunity to select which bed to work and which to reject, the price of coal at the mine is not low in Canada. Alberta coal, which Mr. Geddes in a recent issue deplored was not driving out coal from the United States, sold at the mine in 1922 and 1923 for an average price of \$4.07 and \$4.12, respectively. It would seem that the Albertans with their exceptional coal beds might blame themselves

rather than the railroads for any failure to drive out competing coals.

The Nova Scotia field is old and has extremely difficult circumstances to overcome, and that may explain why in 1922 and again in 1923 it realized an average of \$4.42 for its coal. New Brunswick received \$3.75 and \$3.90, respectively. Another section with great difficulties is British Columbia, its average price being \$5 and \$4.98. The Yukon price in 1922 was \$10 for its small production. Only Saskatchewan, with its lignite field, has low prices. It realized \$2.10 in 1922, and \$2.09 in 1923. The prices in the United States for bituminous coal in these years were \$3.02 and \$2.85. They have dropped since that time to \$2, as *Coal Age* price index shows.

The hope for Alberta and the other provinces of Canada is in more machinery, larger tonnage per plant and per day, and simplification of operation. Neither in politics, polemics nor in feverish recriminations but in industrial efficiency lies the real future of Canada.

## One Meaning for Every Word

ELECTRICAL engineers have a well-defined, exact nomenclature for their industry. No one has any doubt as to what the words used by an electrical engineer mean, provided one knows the technique of the industry. This favorable situation has not happened by chance. The technicians have met together and decided on the meaning of certain words.

The result is not wholly fortunate. The words are exact but there are no synonymns, with the result that good electrical literature is somewhat bald, and repetitions of the same word are inevitable. Moreover, it does not improve with time. We still use such awkward expressions as "alternating current" where we might use some abbreviated form without descending to the use of initials.

Furthermore, electrical engineers in general use awkward verbs. A motor "burns up" or "out" rather than "burns." Why it should "burn up" or "out" no one knows. There is nothing particularly upward or outward in the burning. It may burn down or in, but the engineer insists on the motor burning the other way whether or no.

Nevertheless the standardization of the words the electrician uses is of great help toward a comprehension of his meaning, and it would be well if the mining industry were to attempt a similar standard, drawing from its wealth of words liberally so as to use them all, simply limiting their meaning. Then we would have synonymns that would make the language flexible. We could draw from all our mining regions, from all those of England, Scotland and Wales, perhaps also from those of France, Germany and Mexico, and get a well-rounded nomenclature that could be written fluently.



If need be a few words could be invented to suit modern needs.

Our glossaries are of little use. They tell us all the corrupt usages of mining terms and do not indicate any preference in favor of one or the other usage. We need authority back of our technical dictionary—arbitrary authority if necessary. Then we would know just what is considered the best usage and cease to use the words for other purposes. Thus "gob" is used to express a place where the coal has been extracted and filled with refuse or a place which might be so filled without detriment, if room were needed for such refuse, but we use it also to express a place where the coal, wholly or partly, has been removed so that the roof has fallen or may be expected or desired shortly to fall. It does not include places where the coal has been extracted and in which it is desirable to keep rock from falling or being stowed. To express the place where the roof has fallen or may be expected to fall the English use "goaf" and where it has fallen the words "the broken." It would seem well to adopt "goaf" and to distinguish it from "gob," but there are other definitions that should be determined that are even more important than these. We only half know a science the definitions of which are contradictory and uncertain.

### Glamor from the Past

OUTSIDE the anthracite region how little has been written about the history of the coal industry! H. H. Stoek gave us a little about the Illinois field; something has been done, but meagerly, for Iowa; a little is vouchsafed about the Georges Creek field, Muhlenberg County in western Kentucky, the Hocking Valley and one or more other districts; but a complete history of American coal mining has yet to be written.

The anthracite region has been unusually fortunate. It contains some companies so old that they reach back to the early days. These companies have kept the story before the public, and, strange to say, those who would analyze the anthracite industry to its disadvantage usually have prefaced their remarks with a history of its development. In other sections no such close connection exists between the present and the past, and the work, if done, has been left to antiquarian societies.

Strange to say, no better way exists of reaching the public than through history. The public reveres its Lares and Penates, however questionable, and, truth to say, the original mine owners were respectable and respected. They were pioneers and builders. They were the "forty-niners" of the regions they developed. Around them can be weaved a romance; from them may be evolved a tradition.

Americans never speak ill of their forefathers. Enough of mystery surrounds the past that the names that survive are like the heroes of Greek mythology—supermen. Hence if we would have the public pay the industry the respect due to its importance and value, recall not so much our present-day leaders in mining as those that, being shrouded in antiquity, can be glossed with all the glories of the imagination. Back in past years were men whose ways were dubious. There are railroad men whose actions were questionable, more than questionable—in fine they were rascals—but the hand of time has dealt kindly with them. We

note now only their courage, their foresight, their energy and resourcefulness. The rest is quite generally forgiven, forgotten.

With these exemplars the coal industry does ill to pass over its pioneers. Through them, though they may not have been better than the general run of their enterprising neighbors in other industries, may be found a way to the hearts of the public. They are not less noble than those of our ancestors that burned what they chose to call "witches," that ducked the scolds and persecuted those who disagreed with them. Those who trace their origin from these originals regard that fact as a merit. Surely the story of the pioneers of our industry might be recited to give the public a sense that the mining of coal is "an ancient and honorable" industry, in the development of which the public might take a kindly and not an antagonistic interest.

Then also should we keep the history of the mechanical developments in coal mining. Just at present it is customary to speak of them with disrespect, but surely the story of mining is a record of achievement, no matter what is said. After all, in our transportation methods we are not so remiss. Cars go twice and thrice, even four or more times, to the working face every working day, under conditions of exceptional difficulty. The railroads would find it difficult to prove equal efficiency, even considering the greater distances to be traversed.

The past, of course, will not save the industry from censure. Our contemporaries are too wise to be hoodwinked, but with a goodly present and the glamor of the past we may attain the good word of the public despite the fact that no one is kindly disposed toward any essential industry. The credit of an historic past cannot save us from the consequences of our faults but may spare us unjustifiable persecution.

### Algebra First

HOW MANY first-class efforts to give helpful training of all kinds have been ruined by scholasticism. Many an attempt to give a man the results of experience has been sidetracked by the pedagogs who can see nothing but algebra, geometry and the relation between these studies and pneumatics, chemistry, hydraulics and what not. Industrial education has drifted so far in the wrong direction that the pupil has been discouraged or has been led finally to believe that according to his mathematical ability will his fitness for a position be judged.

In our mine foremen's examinations, unfortunately, we have put geometry, rather than safety, first. Our calculating fiends have put cube and square root where accident prevention should rightly be. The rigorous tests as to a knowledge of safe shooting, safe haulage and safety from gas have taken a back seat. "Let no one enter who is unacquainted with algebra" is our dictum instead of "Safety first." We need mathematical ability in engineers and a knowledge of plain figuring and simple mensuration in mine foremen, but so much geometry and so little safety in our examination questions for mine foremen has made these tests a farce. Looking at these questions would you believe that the mine foreman was about to undertake a responsibility in which men's very lives hung in the balance?

There are two kinds of coal miners today: Non-working union and non-union working.



# "The Hartshorns" Open Big Illinois Strip Pit

Careful Prospecting and Long Stripping Experience Utilized in Pit Layout—Except for One Shovel and Six Locomotives, Pit Will be Electrically Operated Throughout

BY E. W. DAVIDSON  
Assistant Editor, *Coal Age*  
Chicago, Ill.

**I**N THESE desperate days of high mining cost and abyssmal market the lure of the strip pit is strong among coal men. If they could but strike a piece of perfect strip land and steadily produce a lucrative stream of "dollar a ton" coal that would sell as fast as it was loaded out, what bliss life would hold for them! But it is axiomatic that strip property is often more heavily deposited with heartbreak than with coal.

As a result, successful coal stripping largely remains in the hands of men who have learned the science of stripping, and, although many new pits are opening up this year—three huge ones in Illinois alone—the most promising among them are operated by veterans who know that a strip mine, to be an earner, must contain the right kind of coal and plenty of it, that its operating conditions must be good and that its output must be clean, for the day of selling "any old thing" to the public is definitely passed.

Such a pit is the new mine operated by the Black Servant Coal Co., at Elkhart, Ill., on the western edge of the great southern Illinois field. The Black Servant Coal Co. really means "the Hartshorns of Danville," a family whose experience has contributed materially to the development of the stripping art in this country.

## STRIP PIT PROVIDED WITH FIVE-TRACK TIPPLE

The company has opened a 420-acre tract calculated to contain nearly five million tons of No. 6 blueband coal varying in thickness from 5 to 8 ft. under 20 to 45 ft. of cover. It also has an additional 600 acres under 45 to 70 ft. of cover with coal running up to 9 ft. in thickness. A five-track tipple has been built to prepare and load a maximum of 3,000 tons per day and production is now up to 2,000 tons a day. This plant bears many earmarks of an ideal stripping proposition. It has been working at least five days a week since last fall with few unbilled loads ever held over night—and this during a period when most of the deep mines of Illinois were either shut down or were getting two days a week of running time under a burden of "no bills."

Nobody knows better than the Hartshorns that there

is public prejudice against stripped coal. This prejudice has been created during past years when stripping was little more than a matter of ripping off some cover, running a string of railroad cars down into the pit and shoveling into them whatever coal was handy, along with any lumps of clay and shale that didn't get out of the way. Real preparation of strip coal—even washing in some regions—is more recent. But the prejudice still exists.

So the Black Servant Coal Co., following the trail that it and a handful of other big stripping concerns have blazed, set out at Elkhart to overcome a little of that prejudice by giving its output as careful a preparation as any strip pit product ever got, short of washing—a process considered unnecessary in this field.

Although there is a variation in the quality of the coal from section to section of the tract, due in part to the fact that a protecting stratum of limestone overlies only 60 to 70 acres of it, still, the whole coal bed is covered by 4 to 20 ft. of shale. As a result the sulphur impurities carried by ground

water have not raised the sulphur content of the coal to more than 3 per cent in any of the samples that have been tested. Analysis of four samples show heat values ranging from 11,500 to 12,233 B.t.u. per lb. The moisture content runs from 6.30 to 9.71 per cent, ash from 7.09 to 10.18 per cent and fixed carbon from 47.38 to 49.58 per cent. On such analyses as these, the coal is sold as a high-grade steam and good-quality domestic fuel.

More than twenty years ago the farmers of the region excavated a little of this coal for their own use at points near the outcrop of the measure. Geologic disturbances left the deposit so badly broken up, however, that there had never been any mining of consequence, in the bed nearer than the shaft mines at Dowell and Duquoin, two and eight miles respectively to the northeast, and at Hallidayboro, two miles to the southeast of Elkhart. The Hartshorns, with their Danville tracts exhausted, became interested in the region, however, and spent more than a year in prospecting it. Over 2,000 drill holes were sunk before 1,000 acres in two separate tracts were purchased in the winter and spring of 1922-1923.



Main Bottom at the Black Servant Strip Pit

Into this 50-ton hopper, feeding the hoist conveyor, ten-car trips from both sides of the mine deliver their loads. The track layout, when it is complete, will enable locomotives to dump their trips, three cars at a time, and proceed forward around a curve through a switch before they back their empties down into the works for reloading. Thus each side of the mine will have its own haulage operating unhampered by the other half of the mine.





**Few Strip Pits Have Such Tipples as This**

Five tracks, four of them provided with loading booms, together with efficient screening and picking arrangements, enable this tippie to furnish coal as carefully prepared as that coming from a shaft mine. Today the public is prejudiced against strip-pit coal. It is hoped that some of this aversion may be overcome by careful preparation.

In April, 1923, with the 420-acre tract thoroughly mapped, shovels started removing the cover. Tipple construction was begun at once. In November the first coal was loaded out, but without much preparation, for the tippie, designed and built by the Jeffrey Mfg. Co., was not put into operation until this spring. It was finally completed and accepted early in June. Only about two months more of development are required—granted a steady market—to get the stripping, loading and haulage systems lined up in their permanent form and the whole enterprise into full stride.

The tract to be stripped is, roughly, a mile and a quarter wide east and west, and half a mile deep north and south. A spur from the Illinois Central railroad skirts the northern edge of the pit as far as the tippie which stands a little east of center. The coal measure dips to this point and the loaded trips in the pit will have the advantage of an average 2 per cent grade, running down to a 50-ton dumping hopper. From that point a conveyor lifts the coal to the top of the tippie.

The working plan calls for stripping and loading on the advance through the property from north to south maintaining a cut in the form of a cross. Little or no coal will be lost. A thorough cut will be driven straight south from the main bottom, thus opening a permanent haulageway. A stripping and a loading shovel will work back and forth along each arm of the cross. The east and west workings thus are operated as independent units, each with its own haulage system. Three 20-ton steam locomotives are expected to operate in each unit. Each locomotive will handle nine or ten 6-ton cars per trip, moving the loads to the main center haulageway and thence northward to the dump hopper.

#### **CARS WILL BE DUMPED THREE AT A TIME**

The inner rail of each load track will be laid directly along the rim of the receiving hopper, into which the side-dump cars will discharge by threes. After dumping, the locomotive will push its trip of empties forward and around a curve laid close to the north bank of the pit. It then backs down the empty track past the dump hopper and onto the main line again for its run back to the loading shovel. Passing tracks at proper intervals will permit the steady operation of three such trips, for each half of the mine. The only double track will be that down the main center road so that there can be no interference between the two lines of haulage.

The two stripping shovels that are now in the mine will do most of the work of cover removal. They will be assisted, however, by a dragline with a 125-ft. boom

and a 3-yd. box. This machine will work ahead of the shovels on the thorough cuts, so as to move the spoil farther back than the big shovels can reach. One of the shovels is a 300-ton and the other a 350-ton machine. Each is fitted with an 8-yd. bucket and a 90-ft. boom. Of the two loaders mentioned earlier one is steam-operated and the other driven electrically. Both are mounted on caterpillar trucks. Each is equipped with a 2-yd. dipper and ordinarily loads two tons at a dip.

These machines load strips of coal 20 to 25 ft. wide, and the stripping shovels work behind them on berms at least 40 ft. wide, moving the spoil over into the place from which the coal has been removed. It is the effort, however, always to leave an open space in front of the coal face, so as to enable the loading shovel to remove coal with as little clay and other foreign matter mixed with it as possible.

The overburden is of such nature that the only cleaning of the coal bed necessary is done by two men with shovels and wire brooms. These men also lay track for the stripping machines. In parts of the mine already opened, the top of the coal is practically flat containing few pockets and dips such as require cleaning by hand. Throughout most of the work thus far performed, the track for the big shovels has been laid directly on the coal. Only occasionally has it been necessary to timber under the tracks. This simplifies track work to such a degree that two men comprise the entire track-laying crew for each stripper.

#### **SHOOTING RAILS FORWARD UNDER SHOVEL**

One further detail helps to simplify the work of the tracklayers. This is the use of two sections of roller conveyor as long as the shovel frame and suspended under the machines close to the ground. On these the short, heavy sections of rail at the rear of the shovel can be shot to the front whenever the shovel is ready to travel. This saves the time and labor necessary to carry the rails around by hand.

In parts of the pit the work of the stripping shovels is heavy not only because the cover in places runs as deep as 70 ft., but because of the presence in certain localities of heavy lime rock above the coal. Shots are placed in this stratum of sufficient strength to break it up fairly well. Churn drills working on the top of the bank, back from the cut, also put down holes on 20-ft. centers. These are used to shoot up the shale which rests immediately on the coal.

Where the proportion of rock in the spoil is great, one difficulty encountered in this stripping is avoided, for this rock reduces the tendency of the spoil bank to slide. The soil of the overburden is extremely slippery when wet. Because of this fact, throughout the early work in this pit, slides were frequent, covering up the coal face and causing trouble generally.

After several such occurrences the mine operators struck upon a way to put this slipperiness of the spoil to good use. If moisture would make the front of the spoil bank mobile, coasting dirt down into the cut, why would it not coast dirt down the other side as well? Accordingly a water line was run to the rear side of the bank on which each stripper was dumping spoil. A man was placed at this point with instructions to sluice down the rear slope so that each dipperful of dirt would skid to as distant a stopping place as possible. This expedient helped move back the weight of each waste bank and prevented the loss of much time and obviated



much plain and fancy "cussing" down in the workings proper.

Thus far, drainage in this strip pit has not been difficult. Lines of tile leading to the nearest pumping sump are laid under the advancing spoil banks. From the sumps the water is pumped out over the rim of the pit and discharged into convenient gulleys. Up to the present, nine comparatively small centrifugal pumps—one 8-in., four 4-in. and four 2-in.—have done all the work of draining the pit and have been used only periodically, thanks to the fact that the natural contour of the property drains both ways from a low divide running across the tract. A system of 4-ft. ditches encircling the entire pit also helps. Practically no surface water runs into the mine. Ground water and that which rains into the open workings is about all with which the pumps have to contend. The pit has never had to stop work on account of a flood—that bane of the average strip mine.

The mine is electrified throughout except for one of the small loading shovels and the haulage locomotives. Central-station power is delivered from a 33,000-volt line and is stepped down to 4,200 volts in the power company's substation on the property. Thence it goes to the coal company's combination switch house and electrical repair shop which contains the main oil circuit breaker and the metering equipment. One feeder line runs to a separate substation where the current for the tippie is stepped down to 440 volts and where oil-switch protection against overload helps to make the tippie power supply uninterrupted. An underground cable extends from the tippie substation to a central control "pulpit" from which all the motors in the building are started and stopped.

Other feeder lines run into the pit to serve the shovels, the pumps and the compressors that furnish air to the coal drills. Great care is exercised in taking this 4,200-volt power into the pit. Two miles of 3-phase line is built around the rim of the workings that are now active. Those lines that run along the north edge and the east and west ends of the property are carried on poles and the construction is permanent. The cross

line spanning the property on the south side of the workings will be moved southward from time to time to keep pace with the advancing face. It is always to be maintained at a considerable distance, at present 1,500 ft., back from the rim. Laterals tapping it at 1,000-ft. intervals extend northward toward the rim of the cut to supply the lines that actually run into the workings.

Two of these laterals are carried directly to the two big stripping shovels which require the full 4,200-volt current. Everything else in the pit operates on a potential of 440-volts. Portable substations, brought up close to the rim of the cut—but for safety's sake, not down into the pit—supply the loading shovels, the pumps and the compressors with 440-volt "juice." A safeguard against electrical accidents in the mine is provided through the use of a metallic neutral carried on all lines of consumption. By all these precautions in line building and protection the possibilities of accident are greatly reduced. Thus far no injury from electrical shock has been suffered by any employee.

#### COAL PRODUCED RECEIVES EXCELLENT PREPARATION

The five-track tippie is completely equipped to prepare and load mine run, 1½-in. screenings, 2 x 1½-in. nut, 3 x 2-in. nut, 3 x 6-in. egg, and 6-in. lump or any combination of these sizes. All grades above 1½-in. screenings can be delivered to a 400-ton-per-hour single-roll crusher. Of late much crushing has been done. The flexibility of the tippie equipment is noteworthy.

Coal is delivered from the big hopper on the main bottom of the pit to the tippie by means of a 48-in. steel-pan conveyor operated by a 100-hp. slip-ring motor taking 440 volts alternating current as do all the other motors in the tippie. The extra-long shaker screens have two cranks driven by a 40-hp. induction motor.

The over-all length of the shaker screens is 72 ft., and their width is 7 ft. There are 16 ft. of 1½-in., 14 ft. of 2-in., 12 ft. of 3-in. and 10 ft. of 6-in. perforations. In addition there are three more feet of 1½-in. perforations in a degradation screen set into the chute under



#### East Wing of Mine

At this particular point there is about 5 ft. of coal under 35 ft. of cover. Development has not yet progressed sufficiently to furnish the normal output. Eventually the two working faces will form practically a straight line extending across the property from east to west. Haulage will be along either face and thence down the main haulway northward to the tippie bottom. Note the limestone ledge which is over much of the coal and has to be blasted individually. It has aided in keeping the coal below it in good condition.





#### West Wing of Pit Is Only Well Started

This is a view looking west across the main bottom where a trip is being dumped three cars at a time. The haulage locomotives and one shovel are the only machine in the whole plant that are not operated electrically.

the 2-in. screen and a short 2-in. degradation screen under the 3-in. discharge, thus making separation of the small sizes as complete as possible.

The screenings fall directly from the shaker into a hopper delivering to railroad cars. By the use of a fly-gate all the screenings can be delivered to a conveyor extending along one wall of the tippie and parallel to the railroad tracks. This discharges to a flight conveyor running across the front of the tippie just above the forward ends of all the loading booms. This is the assembly or mixing conveyor.

The lower run of this mixing conveyor moves from the screenings side of the tippie to the lump side. Thus the screenings can be delivered alone by a drop gate and chute into any car on the five tracks or they can be mixed with any other size being loaded. Any of the other sizes can be cross-hauled by this mixing conveyor by the simple expedient of lifting the end of any loading boom so that it will deliver onto either the top or the lower run of the mixing conveyor, depending upon which direction the coal is to move. The upper run delivers to the crusher.

#### LARGER COAL SIZES ARE THOROUGHLY PICKED

Between the shaker screen and the loading booms are ample picking tables, each 26 ft. long. It is customary to employ 11 pickers. Four work on the lump table, four on egg, two on the 3 x 2-in. nut and one on the

2-in. nut. A refuse conveyor moves the pickings back toward the pit delivering them into a hopper from which trips can be loaded so that this material can be hauled back and dumped into areas from which the coal has been removed.

Railroad cars are moved by gravity from the point where they are delivered in the empty yard over a 2 per cent hump above the tippie until they have been lowered across an automatic recording scale into the flat-grade load-storage yard below. A caterpillar tractor has proved handy around the tippie for occasionally moving cars against the grade and forms the coal company's nearest approach to a switch engine. It was a highly useful piece of apparatus around the works during the early development stages. It moved everything that needed moving and did it with precision, neatness and dispatch.

The coal company has built a two-story brick office building and weigh house and a small bath house 150 yd. east of the tippie. Seldom are such substantial buildings seen around a strip pit.

The shop building is a 50 x 90-ft. steel structure and houses a most complete set of mine-shop equipment and a crew of mechanics. These latter under the direction of C. W. Norman, who is in charge of all top work, can do practically all the repairs that will ordinarily be necessary in the mine. They can do heavy forging on steel such as is used on the shovels, they can manufacture all the switches, frogs and steel ties the company uses. In fact they are balked at little or nothing.

The equipment of the shop consists of a forge, a 500-lb. power hammer, a 300-ton hydraulic press, a 24-in. shaper, 24-in. and 26-in. drill presses, 13-in. and 54-in. lathes, two emery-wheel stands, a 6 x 9-in. high-speed, power hack saw, oxycetylene welding and cutting torches, an electric welding outfit, a small power-driven air compressor and an assortment of small tools. Traveling cranes aid in handling heavy work. A pit has been sunk in the floor and eventually a track from the workings will be run directly into the shop to facilitate locomotive repairs.

The staff at this mine consists of W. B. Reid, general superintendent; Otto Ullom, field boss; F. S. Burns, electrical engineer; C. W. Norman, top boss; Henry Meyer, shovel boss, and E. H. Elder, chief engineer.



#### Black Servant Buildings Are Permanent

In the foreground is the main office and scale-house building while in the left background appears a portion of the wash house. Both have been built with the idea that they should last throughout the life of the property. Strip-mine buildings are seldom made as permanent as these.

#### Accident Rate at Coke Ovens Falls

Accidents in the coke-oven industry of the United States in the year 1923 killed 45 employees and injured 2,593, according to statistics compiled by the Bureau of Mines. Coke manufacturers employed during the year 23,729 men, a larger number than was employed either in 1921 or 1922. The accident rate for the industry was the lowest in 10 years, with the exception of the years 1915 and 1922. The reduction, however, was confined to accidents of a nonfatal character, as the fatality rate increased slightly as compared with the two preceding years. The accident rate for the year, based on 1,000 full-time, or 300-day workers, was 102.94, of which 1.76 represented the fatalities and 101.18 the nonfatal injuries. The fatality and injury rates for the year 1912 were 1.59 and 93.77, respectively, and those for the 5-year period 1916-1920 averaged 1.81 and 167.03. Comparing the rates for 1923 with those for the 5-year period, the fatality rate in 1923 represents a reduction of 3 per cent and the injury rate a reduction of 39 per cent.



# Recovery Work After the Castlegate Mine Disaster

## What It Taught and Exemplified\*

Typical Example of Organization and Recovery — Treatment of Bodies — Establishment of Ventilation — Testing of Apparatus Before Use — Inspection of Men on the Rescue Teams

BY A. L. MURRAY  
Surgeon, Bureau of Mines, Pittsburgh, Pa.

**R**ECOVERY of the Castlegate No. 2 mine at Castlegate, Utah, following the explosion of March 8, forms an excellent example of the organization that must be perfected and the procedure that is usually followed in the recovery of any large mine after a major disaster. Although each such occurrence has its own peculiarities, in which respect the one at Castlegate was no exception, yet the operations conducted after that explosion were of the type followed in recovery work in general.

The explosion in this mine occurred shortly after 8 o'clock on the morning of the date above mentioned. The day force had been underground only a short time, and the small night force had not yet left the operations. Every man underground at the time of the explosion—there were 171 in all—was killed.

On the morning of the disaster, the Utah Fuel Co., which had temporarily closed down its No. 1 operation replaced a number of the single men previously employed in No. 2 mine with older employees and married men from No. 1. This accounted in large measure for the large number of married men who lost their lives.

Immediately following the explosion, a call for rescue crews was sent out from the mine office to all coal-mining operations in the district. Within two hours teams from nearby camps were on the scene fitted with oxygen apparatus and ready to enter the mine. By afternoon more men were present than could be utilized at that stage in the recovery work. In all twenty-one apparatus teams took part in the work of exploration and recovery. They embraced six teams with the Paul and fifteen teams equipped with the Gibbs type apparatus. Both types gave excellent satisfaction.

The fact that twenty-one mine-rescue crews, all composed of trained men and provided with apparatus more than sufficient to equip them, could be assembled in less than twenty-four hours is a credit to the coal-mining companies of Carbon and Emery Counties, Utah. It also forms concrete evidence of the value and effectiveness of the training given apparatus crews by the Bureau of Mines. As these rescue teams reported for work they were grouped into three shifts, each consisting of seven apparatus crews.

Inasmuch as the change house adjacent to the main

mine portal was large, steam-heated and had an adequate supply of both hot and cold water it was selected as the apparatus base. Here all machines were cared for, recharged with oxygen, supplied with fresh regenerators and given a thorough test before being put to use underground. Suitable work benches were installed at one end of the change house, and experienced men assigned to the work of testing and recharging the

apparatus. An adequate supply of spare parts furnished from the surplus of the various companies which had teams present was kept on hand at all times.

From a preliminary survey of the conditions existing after the explosion, it was ascertained that roof falls and debris blocked the main portal of the mine. Accordingly, it was decided that an escapeway located about a quarter of a mile

up the canyon offered the best means of ingress and egress for exploration and recovery work. This opening was comparatively free from obstructions.

The general working schedule for the apparatus teams on each of the three 8-hr. shifts was as follows: Two teams were actively engaged in exploration and recovery work underground for a period of two hours, the actual time under oxygen varying from one hour to the full period. Two teams were held in support at the entrance of the escapeway ready to relieve the men underground at the end of their turn and also prepared to respond in case of emergency. The teams in support were housed in heated tents. The remaining three teams held in reserve rested at the change house.

### MOVE UP PAIRS OF TEAMS EVERY TWO HOURS

As the active teams completed their tour of duty underground, they returned to the change house to rest. Those in support took their place in the mine and two teams that had been resting at the change house moved up in support. Thus one team, the seventh on the shift, was available for any special exploration work or for replacements or as supernumeraries in case any member of the other teams became incapacitated. All teams, together with their apparatus, were transported from the change house to the escapeway and back by auto buses.

Each crew of apparatus men was supported by fresh-air crews—men who did not wear apparatus and worked only in sections of the mine where ventilation had been re-established. These men transported materials and

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supplies to the apparatus crews, and received the bodies brought out by the rescue teams and carried them to the surface.

Each shift was under the direction and supervision of three experienced men selected from the mine superintendents, engineers and mine foremen of the various mines in the district. One of these supervisors directed the work at the apparatus base, one that at the mouth of the escapeway and one the operations underground. Although this distribution of the work formed the general plan of direction, in many instances the underground supervision was augmented by advisory members made up of the general manager, general superintendent and chief engineer of the Utah Fuel Co., the general superintendent and chief engineer of the United States Fuel Co., the chief mine inspector and the coal-mine inspector of Utah, and mining engineers from the federal Bureau of Mines.

As soon as possible after the explosion, the ventilating fan was placed in operation exhausting. This machine had not been damaged but the controlling doors for reversal of the air current had been jammed by the force of the explosion coming out of the aircourse. A general plan for exploring and recovering the mine through the escapeway which connected with the main slope by the second left dip entry almost midway of the operation was adopted.

By this means, fresh air entering the escapeway could be carried forward by temporary stoppings. The apparatus crews kept in advance of the fresh air making explorations and constructing new stoppings to which points the fresh air was successively carried. In this way, the recovery work was advanced in safe stages, down the dips on the left, back up the dips on the right and then on up the raises until the entire mine had been reclaimed.

On several occasions progress was appreciably delayed by fires. These had to be dealt with when met and had to be completely extinguished before further progress could be made. As soon as any section of the mine was cleared of gas, by having fresh air turned into it, a patrol of two men was established whose duty it was during their shift constantly to traverse the section watching for evidence of fires and testing the air for explosive mixtures of gas. Each of these men carried a safety lamp and a canary. These birds, which form one of the most reliable means of testing for carbon monoxide, were extensively used in this work. Although about seventy were available, fifty having been shipped to the mine the day following the explosion, only about forty were actually used. Of the forty birds, the lives of about sixteen were sacrificed in order that the men might be amply protected.

One lesson learned from the use of canaries at Castlegate is that carrying cages should be provided with wooden bottoms. Several all-metal cages with bottoms unprotected were in use. In every instance the birds occupying these cages developed an affection of the legs resembling rheumatism. This probably resulted from the chilling of their feet when the cages were exposed

to continuous currents of cold intake air. Birds so affected would not use the perch, but would squat on the bottom of the cage. Birds in wooden cages were not affected in this manner.

Again, at least one side, or better two adjacent sides, of the cage should be closed to protect the birds. Canaries are highly sensitive to drafts, and cages with two solid sides will permit exposure of the birds to mine atmospheres yet afford some protection from currents of cold air. At the Castlegate disaster there were more than enough birds for all testing purposes, but in cases of a similar nature elsewhere the number available might be limited and the needless disability of only a few birds might seriously handicap exploration and recovery work and possibly endanger the lives of men entombed.

During the early stages of the recovery work, hope was entertained that some of the miners might be found alive. As work progressed, however, and evidence of the extent and severity of the explosive blasts accumulated, the chances of finding anybody or anything alive in the mine became fainter and fainter. Nevertheless, hope and effort were ever spurred by such a possibility.

Whenever the rescue teams in exploration work discovered a body, it was

placed on a stretcher and carried to the nearest fresh-air base. Here it was turned over to a fresh-air crew and brought to the surface. Many such bodies had to be carried more than three-quarters of a mile. The first body of the 171 men who lost their lives in this disaster was taken from the mine about 11:45 p.m. on the day of the disaster, and the last of the bodies were brought out on Thursday, March 18, at 4 p.m. Work of recovering bodies was pushed as rapidly as was consistent with safety. But, as previously mentioned, fires greatly delayed operations. These had to be controlled and extinguished before further progress could be attempted.

Medical organization under the direction of Dr. McDermit, the camp surgeon, consisted of one physician at the morgue, one at the local hospital, two on 12-hr. shifts at the apparatus base and six on 8-hr. shifts at the escapeway opening. The duties of these men were as follows: The physician at the morgue was Dr. McDermit, who was acquainted with most of the men at the mine as well as with their families. He completed identification of bodies where doubt existed, saw to the issuance of death certificates and burial or shipping permits.

The physician at the hospital cared for patients sent there and looked after the general medical welfare of the camp. Those stationed at the apparatus base examined members of the various teams before they went on shift, supervised the disinfection of apparatus mouthpieces and their covering with sterile gauze while awaiting use, the disinfection of hands of members of teams as they came off shift and the caring for and dressing of cuts, bruises and abrasions so as to prevent possibility of infections.

The reason for exercising so much care on the disin-

### DANGERS OF DOING ONE'S UTMOST

**I**N the recovery work, strain completely unnerved one apparatus man, and when his nose clip was brushed off he fought with his team mates and was brought to the surface still struggling. Unfortunately the captain's nose clip was dislodged in the struggle. When found he was already dead. It is believed his fatigue prevented him from making necessary adjustments. Later the work was better organized and none was allowed to do more than he could safely perform.



fection and protection of apparatus mouthpieces will be realized when the large number of men using apparatus is considered and when it is remembered that the same apparatus was not worn by the same man on the various shifts. Careful disinfection of the hands of the team members as they came of shift, as well as the protection by proper dressing of bruises, abrasions and cuts was necessary in order to protect the men from the results of a possible infection incurred while handling bodies in the mine.

#### IDENTIFICATION OF BODIES EXTREMELY CAREFUL

The physicians stationed at the escapeway received and examined all bodies removed from the mine with a view to aiding in their identification through mine checks, clothing, articles found in the clothing or peculiar body marks. For each body removed careful notes were made as to place of recovery and anything found about or on the body that could in any way aid in identification. These doctors were equipped also with necessary materials to care for any injury received by the men when in the mine. The physicians who assisted in the work at this disaster, aside from two from the Utah Fuel Co., were mainly those from surrounding towns and coal operations, as well as myself.

The Knights of Pythias Hall at Castlegate was turned over for use as a morgue and corps of sixteen undertakers was on duty constantly. In addition to these, the various Carbon County Posts of the American Legion kept a large number of men at the morgue to assist in handling the bodies and preparing them for burial. As rapidly as bodies were positively identified, prepared for interment and placed in caskets, they were removed to the Community Hall nearby.

#### ANIMAL CARCASSES TREATED WITH CHEMICALS

In addition to the 171 men, nineteen horses and mules were killed underground. No attempt was made to remove the putrid carcasses of these animals. Whenever one was discovered, chloride of lime was sprinkled over it and later, men in apparatus chopped open the abdominal and chest cavities, placing quick lime therein as well as over the entire carcass. By the action of this material through the absorption of body fluids, such carcasses were reduced eventually to dry flesh, skin and bone which could be removed later with little difficulty.

For the comfort of the men engaged in recovery work, the company maintained two canteens where hot coffee, sandwiches, fruit and tobacco were kept on hand at all times for free distribution. One of these canteens was placed near the apparatus base in the change house and the other near the escapeway. In addition to these comforts, the company also supplied both rescue crews and fresh-air men with the necessary changes of overalls, jumpers, socks, underwear, shoes and cotton gloves. During the later stages of the recovery work, electrician's rubber-faced gloves of a heavy type were furnished the crews which handled bodies.

From all the evidence obtainable, it is believed that death was instantaneous in every case. This was evident from the positions and attitudes in which the bodies were found, not a man having moved from the place occupied at the time of the first blast except, of course, those thrown an appreciable distance by the violence of the explosion. Not a single instance could be found where it was indicated that a man had

struggled or made any attempt to protect or save himself. A careful examination of the bodies showed carbon-monoxide saturation of the blood which, except for the few men who undoubtedly were killed instantly by direct violence from the initial blast, was the accepted cause of death.

Examination of the mine showed that the violence of the explosion varied in different sections, in some places being extreme and in others comparatively slight. Regardless of the violence shown in any given section, however, it is believed by those who made a careful examination that the initial explosions were of sufficient intensity to deplete most of the mine air of its oxygen and that the carbon-monoxide content of the afterdamp which quickly spread to every part of the mine except possibly the face workings at the top of the raises, was so high that no living thing could have survived it more than 30 sec. The thick bed of coal worked in this operation, the straight continuous main slope extending throughout the entire length of the mine and the numerous crosscuts no doubt appreciably aided in flooding the mine with afterdamp.

#### EVERYBODY BURNED BUT SOME AFTER DEATH

Burns were evident on everybody removed from the mine. Naturally, these were most severe on the exposed parts, such as the hands and faces, and in most instances these presented a complete charring of the surfaces, into which had been driven fine pieces of coked coal. On those bodies where the clothing had not been torn or burned away (the majority were found fully clothed), areas giving every evidence of burns from dry heat were found. All this burning apparently occurred after death, as no evidence was discovered of blistering or an inflammatory area surrounding the burns. This further strengthens the supposition that death in practically every case was due to carbon-monoxide poisoning. Severe burning of the face of nearly every one of the bodies necessitated care in noting the places where the bodies were found, and rendered it important to make a careful search of the clothing as well as an examination for peculiar body marks for purposes of identification.

#### COKED COAL DRIVEN INTO BURNED SURFACES

Small pieces of coked coal driven into the burned surfaces gives fair evidence that most of the burns were caused after death by the final dust explosion which was characterized by longer and more intense flame and by the formation of coke dust.

The apparatus crews worked a total of 121 shifts, or an average of 6 shifts each. Total rescue-apparatus hours amounted to 3,840 and only one serious accident was recorded during the time that work was in progress.

During the afternoon of the day on which the explosion occurred several men working in the open air on a fall of rock at the portal of the main opening, at least 20 ft. from the mine mouth, were overcome by gases issuing from the workings. At least eight hours had elapsed since the last explosion and much fresh air had been entering the mine meanwhile through the escapeway, yet the monoxide content of the mine air was sufficient to cause these men 20 ft. outside of the workings to be overcome. All of these men made a quick recovery when removed beyond reach of the fumes and given a short period of oxygen inhalation.

One highly unfortunate accident was the death of



a member of one of the rescue crews. During the first afternoon one of the teams from Spring Canyon, which had already made four exploratory trips into the mine, was on its fifth trip about 1,300 ft. in at a point where the going was difficult. One of the crew in passing another brushed off his nose clip. The man whose nose clip was thus removed became panicky, requiring considerable effort on the part of the balance of the crew to control him. With his nose clip replaced, he was being brought to the surface still struggling and wrestling. In attempting to keep the man quiet the captain had his own nose clip knocked off and possibly his mouthpiece dislodged.

At this time the team was still several hundred feet from the mine opening. The captain stopped, evidently to replace his nose clip, while the remaining members of the team continued with their partially overcome team mate to the surface. As soon as they reached the outside, Captain Wilson's absence was noted and a new team entered the mine and brought him out. Arrived at the surface, however, no signs of life could be detected, but artificial respiration and oxygen inhalations were administered and kept up continuously for more than an hour. Adrenalin injections were also given, but the heart and respiration failed to respond to anything that medical science could offer for resuscitation. This man left a wife and two small children.

#### FATIGUE PROBABLY CONTRIBUTED TO DEATH

Captain Wilson's unfortunate death occurred during the early hours of recovery work before complete organization of forces was possible. It is believed that a contributory cause to this accident was fatigue. The first teams on the scene naturally desired to accomplish the utmost possible toward the rescue of those in the mine, especially as hopes were entertained that many still might be alive. The repeated trips made by this crew undoubtedly caused fatigue which in the stress of their enthusiasm and excitement was little noticed. When a crucial moment arrived when reserve strength was necessary, a fatigued body could not endure the strain. This was evidenced both by the lack of nervous stability on the part of the man whose nose clip was first knocked off and again by Captain Wilson when his strength was not sufficient for him to right his apparatus and make his way 300 ft. to fresh air.

Later on when organization of the work and forces had been accomplished every rescue team before entering the mine was given a careful examination by a physician and upon the least sign of fatigue or other incapacitating condition, the men were forbidden to wear apparatus. After the establishment of this inspection, not a single accident occurred. On several occasions, however, men were excluded from teams for causes which in the opinion of the examining physicians made their use of apparatus not only a possible source of danger to themselves, but also to their team mates.

**LIQUID OXYGEN NOT SUITED TO COAL MINES**—Studies made by the Bureau of Mines indicate that though liquid-oxygen explosives may be used to advantage, especially in the lessening of blasting costs in iron, salt and other mineral mines and quarries, preliminary tests indicate that they are not suitable for use in gaseous and dusty coal mines. Experiments, however, offer some hope of so modifying these explosives that they may be made suitable for certain uses in such mines.

## Deadly Air Blasts from Falling Roof Rock Kill Many Miners in India

BY DAVID PENMAN

**M**OST of the workable seams in British India are of great thickness. This is particularly true of the mines of Bengal, Bihar and Orissa, where over 90 per cent of the total coal output of India is produced. Seams of 20 and 30 ft. in thickness are common, and in some cases coals 90 ft. thick, and even more, are found. In one instance 150 ft. of coal in one continuous seam has been reported.

Air-blasts, due to the sudden expulsion of air from the collapse of a large area, are not uncommon in Indian mines. One such occurred in 1923 in a mine of the Central Provinces. The area which collapsed was not unusually large, about 5,000 sq.ft. perhaps, and the seam was only 3 ft. thick; but the air in that space was propelled with such force through a narrow surface incline that fourteen persons who happened to be sitting in the incline entrance, preparatory to entering the mine, were hurled through the air for distances varying up to as much as 200 ft. Of these fourteen, twelve were killed outright and one died from the injuries received. In another instance five persons who had retired from a mined-out area on which the roof was weighting to what they thought was a safe position were blown off their feet and dashed against the sides and floor of the gallery. They were all injured, but fortunately none died.

As already has been mentioned, the roof is as a rule strong, and in consequence large areas are often mined out before the main roof gives way. Sometimes the goaf may be standing like a colossal hall, perhaps 400 ft. square, and not a sign of a break be apparent. A collapse of such a size in a 20-ft. seam would displace a volume of air of over 3,000,000 cu.ft. Assuming the actual collapse to occupy an interval of one minute, the velocity of exit of the air through a pair of shafts 18 ft. in diameter would approximate to a mile a minute. Sometimes the actual "fall" occupies much less than a minute.

If the whole area collapsed simultaneously from the surface (which is what probably happened in the mine of the Central Provinces just mentioned above), according to the law of falling bodies the fall in a 20-ft. seam would occupy only slightly more than one second. The collapse of a large area, however, is generally made up of a series of falls, and moreover some of the displaced air finds room in the spaces between the blocks of stone or in upper cavities left by the falls, so that the actual expulsion of air is always less both in volume and in velocity than the theoretical figures based on the assumption that the whole mass fell simultaneously and freely. Nevertheless, the danger is one that must be kept in mind by those who have charge of mines in which large areas of uncollapsed goaf occur.

It has been suggested that the sudden compression of the air at the instant of the discharge of explosives may result in a temperature sufficiently high to ignite an inflammable mixture of firedamp and air. The sudden compression of the mine air due to a large fall of roof must similarly bring about a considerable increase of temperature.

NOTE—From a paper entitled "Some Problems of Indian Coal Mining" read before The Mining Institute of Scotland at its Dunfermline meeting.



# Narrowing the Gulf Between Banker and Promoter

What the Banker Will Want to Have in Black and White —  
He Doesn't Know the Coal Industry but He Does Know Finance  
and He Will Ask Questions You May Not Have Duly Considered

BY P. H. GROSSMAN

Natural Resource Division, The American Appraisal Co.,  
Milwaukee, Wis.

IT IS sometimes said, by promoters, that bankers are the despair of those who would develop the natural resources of this country. It is also as frequently said, by bankers, that promoters are the despair of those who would soundly exploit our great natural resources. It is, in other words, quite evident to the student of the situation that a broad and sometimes impassable gulf separates the two.

The difficulty, like so many of its kind, seems to lie in a more or less superficial misunderstanding rather than in any deep-seated differences of viewpoint. The solution would seem to be a clearer understanding by each of the position of the other and of the means for bringing both banker and promoter together on a common ground.

To say that all bankers classify all natural resource developments as extremely hazardous is as erroneous as to endow all promoters with a belief that all their undertakings are absolutely safe and sound. The banker is primarily a conservator of wealth. The implicit trust imposed in him by the depositors of his bank, forces him to take a negative attitude until the merits of a proposition have been definitely proved to him. He is a banker first and last, and not a promoter. The banker's attitude toward a promoter must be based entirely on the evidence submitted to him: The examination of the property, a prospectus outlining the alleged development possibilities with a statement of expected earnings, prepared, all too briefly, by the promoters; and in most cases a rather glibly optimistic presentation.

Instantly, there arises in the banker's mind that basic element of banking, the seriousness of which only a banker can fully comprehend: "Suppose you fail, what will the investors get for the money I told them to give you?" The banker can be favorable only when every reasonable doubt has been banished from his mind.

For this incredulous attitude, the promoter is most to blame. A resumé of natural-resource financing for the past ten years or more would reveal an unfortunately large number of instances in which bankers, and through them investors, succumbed to the unlightened, if not frankly misrepresented, optimism of the promoters. The promoter never concedes that failure in his particular enterprise is possible. As a class, therefore, he is regarded as radical, as a dreamer, one to whom the unproven is real, one with unbounded enthusiasm, one whose sound business judgment is warped by his ambition, one who enters into a project

body and soul with little or no knowledge of the infinite details involved in the recovery of natural resources. It is this type of promoter who is directly responsible for the failure of many laudable enterprises to bear fruit, and for the abandonment of many properties which with proper financing and administration should have been profitable enterprises.

The question immediately arises as to how we can overcome this divergence of viewpoint. Our industrial and economic future which is dependent upon the development of our great wealth of natural resources, requires the sincerest co-operation between promotion and finance with unison of effort and understanding toward a common end.

Surely we cannot continue forever to attempt to

hurdle the wide gap between proposed enterprise and the source of finance, only to fall midway down the chasm which is becoming deeper and more difficult of spanning, because of the visionary attitude of the promoter on the one side and the unconsciously retrogressive attitude of the banker on the other.

What is the remedy of this situation, for remedy there must be? There can be only one answer: First, the use and dependence upon facts rather than dreams on the part of both banker and promoter; and second, the discovery and presentation of all relevant facts in each instance. This means, simply, that before he approaches a banker, the promoter should arm himself with all provable and reasonable facts regarding the raw material in the ground, the process of its extraction, the manufacture or fabrication, its distribution, and finally its potential usage. Only with such compendiums of facts, but with assurance if they are presented, can promotion and finance arrive at a mutual understanding.

The marshalling of this evidence is not a task for either the banker or the promoter. In the first place, both are interested parties, and both must consequently though unconsciously see things through the eyes of preference or prejudice. Neither has the facilities, the training, the experience, or the time to make a sufficiently adequate investigation. Both, however, can avail themselves of the services of organizations with a personnel of specialized training, each individual of which has the intellect and power to rid himself of any preconceived conclusions and to start out with a desire for the truth with facts as his only objective.

The facts are there. It is the natural-resource appraiser's duty to find them. He can add nothing to

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THE banker must leave the appraisal of the property and the question as to the marketability of the product in the hands of technical men in whom he has confidence and on whom he must rely sometimes not only for the mere facts, but also for the main inferences to be drawn from those facts, for being a novice at the industry he is without power of comparison.

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nature. He can only bring a trained mind to bear upon the gleaning of these facts. His investigations are unimpassioned but relentless. His findings are disinterested and authoritative.

The appraiser of natural resources must be more than an engineer. He must have the acute perception of the engineer, but he must combine with this the viewpoint of the investor, of the banker, and of the promoter. He must see details as they affect the whole. He must have the ability, the courage, and the conviction to conduct his investigations in an unbiased manner, with consideration of all hazards as well as of all advantages incident to the particular case. He must be competent to withstand the ambitious optimism of the promoter as well as the conservative pessimism of the banker. He must, in other words, arrive at his conclusions and present them in such manner as to be of the greatest possible assistance in the exploitation of our natural resources.

Much might be said about the qualifications of the natural-resource appraiser, and much should be understood by the banker and the promoter who are to successfully employ his services. The appraiser must be competent to test his own conclusions in the practical affairs of life, and if he has not the time or opportunity to do this, he must be eager to have other competent persons do it for him. He must be a guide in, and inspiration to, industrial progress. And above all he must be the rectifier of errors. There are few individuals or organizations so constructed as to be better or more exclusively devoted to the public good.

#### PROMOTERS FAIL TO SEE GLARING HAZARDS

The need for his services is peculiarly manifest in the promotion of undeveloped or only partially developed properties which have no history of operation. All too frequently in these instances, glaring hazards are overlooked or powerful advantages missed because of a too cursory view of the process. The following case is typical: Certain promoters desired to finance the acquisition of a certain marble deposit. The property consisted of several hundred acres of land underlaid with the deposit and equipment worth about \$100,000.

The product of the deposit was of unusual quality, and in a quantity that could not be exhausted in less than 300 to 400 years. These two elements were so plainly evident that the promoters, in their overabundance of enthusiasm, failed to give proper consideration to the great number of other facts which in this instance were of even greater importance, nor did they believe that anything else mattered once the facts as to quality and quantity had been definitely established. They failed to ask themselves and then answer the question "What will we do with it after we have it?"

They had a definite financial program in mind, which, however, was not acceptable to the financial interests approached, and was entirely changed after an investigation and analysis by an appraisal organization of the following points to which the promoters did not attach sufficient importance:

LOCATION:	Size, area underlaid, remoteness from metropolitan influence and nearness to other operations of a similar character.
EXPLORATION:	Method used, when, by whom, to what depth, and at what points on the property.
QUALITY:	Chemical and mechanical analysis and uses to which the product could be adapted.
RECOVERY:	Relation of quantity of commercially recoverable quantity to the total quantity in place.
DEVELOPMENT:	Cost of equipment, and all operations necessary to open the deposit to a point of commercially profitable recovery, representing capital invested.
COST OF RECOVERY:	Administration, labor, power, supplies, compensation and other insurance, taxes, depreciation and maintenance on equipment necessary for and devoted to recovery, working capital, interest on investment, and contingencies.
WASTE:	Relation of quantity quarried or mined to quantity commercially salable.
SHIPPING FACILITIES:	Nearness to and extent of railroad and water connections.
MARKET:	Where, to whom, in what quantity, for what purpose, at what freight rates, at what selling prices, from what source is this market now supplied? What quantity and quality of product is being supplied by competing operations?

Through analysis of these elements and the facts affecting them the reasonable expected gross return from which the cost of recovery is subtracted results in the net earnings available.

The net earnings in this instance were far from sufficient to justify the capitalization as proposed by the promoters, and thoroughly illustrated the folly of their financial program. Through the analysis that was made, however, elements of extreme importance were revealed to the promoters, thereby permitting intelligent construction of their organization and providing for certain advantages of which they knew nothing.

Only an organization thoroughly equipped beyond its engineering talent with ample reference resource, authentic statistical data, and an appraisal personnel of practical judgment, gained through years of experience, can in these unproven cases fairly and open-mindedly consider the hazards as well as the advantages in a manner which is of inestimable value to the proposed operators, of real assistance to the bankers, and of protection to the investor. Such an organization creates a situation built upon facts and affords an opportunity for sane discussion on a mutually understood basis.

#### APPRAISAL ORGANIZATION AIDS ALL PROPERTY

Even in the case of developed properties having a history of operation there is need for such services. These properties are too frequently found warped by weight of their own internal affairs; their management is often totally oblivious to progress in their own field of endeavor. An appraisal organization composed of specialists offers the best antidote for such and other business diseases. The appraisal investigation and analysis often provides for a new program of progress, many times bringing tottering businesses to their senses and frequently proving to the outside world that a particular enterprise has real merit and can proceed successfully with the aid of finance which it can get only through the uncovering of facts properly analyzed and presented in an understandable manner to the wants of those who "must be shown" in order to become convinced that the particular business is deserving of the financial assistance desired.



In cases where new projects are proposed as in the case of undeveloped properties, or, in cases where additional capital is required, the appraiser renders the most important service. He must be competent to determine the soundness of the new investments, the dependability of income to the investor, and to what degree the principal invested will be safeguarded, the adequacy of the security, and the degree of certainty of the borrower to pay the stated interest.

In one case, for instance, an operator needed added capital to the extent of a half a million dollars, but had difficulty in obtaining it. He knew his own business thoroughly, but he alone knew it. In approaching financial interests he was unable to present his problem in a manner free from conscious or unconscious bias. The statement of earnings as presented by him showed a rather substantial net income, but after the same process of investigation and analysis as was described above, it was revealed that the earning statement compiled by him was wrong.

He had charged to operating expense items properly belonging to capital account, and it was further revealed that a byproduct which had been given little attention in the past, could be diverted to a market which would bring a rather substantial return. As a result an earn-

ing statement was compiled which when presented with a detailed appraisal of the plant and its equipment showed the desired loan of half a million dollars more than justified and it was quickly obtained.

The value of any natural resource is dependent upon its earning ability and it is, therefore, fundamental that proper recognition be given to all relevant facts affecting the recovery, processing, marketing and utilization of the product and their collective influence upon the expected earning capacity of the enterprise.

Only after all investigation and necessary analytical work to determine the extent and truth of the advantages and hazards affecting these elements has been properly completed, can the facts be revealed and assembled into a workable plan of operation. A statement of anticipated earnings can then be compiled to show an expected net income which when capitalized in accordance with standard practices will result in the present fair value of the deposit.

Properties of real merit have failed to get started and may have failed in their infancy because of an improper beginning. In each instance it would probably be found that the underlying cause of these failures was the lack of a competent appraisal analysis compiled in a businesslike manner.

## The Miner's Torch

### Who Envies the Engineer?

IN THE course of a business transaction in which I have just been concerned I fell heir to a report covering the trusteeship of a coal-mining property dated only a few years back, and because it happened that at the moment when I first saw the report I had a few idle moments on my hands I read the report through carefully, which is something that I or no other person could have done ordinarily.

We hear much about the fees earned by professional men in the so-called learned professions in contrast to the fees earned by engineers. The report that I have just mentioned contained some sure enough first hand reliable information along that line and I am loaded now for the next college professor who tries to tell me that all this talk about engineers being poorly paid is untrue and harmful to the profession.

Boiled down the events contained in the "account" ran something like this:

(Act 1). Company thrown into bankruptcy with no money in sight to pay any of its creditors and all of its stock (\$200,000 original value) declared worthless. \$200,000 in bonds probably fully secured as the land and improvements were always considered worth in excess of \$300,000.

(Act 2.) Trustee in Bankruptcy appointed followed six months later by a Bondholders Protective Committee. All operations had been discontinued before the Trustee was appointed.

(Act 3). The lawyers appointed by the Protective Committee recommend a consulting engineer and he is employed to appraise the property and suggest, if possible, a purchaser to be interested in the property at the engineer's valuation.

(Act 4). Valuation report is submitted and purchaser located by the engineer who agrees to pay \$220,000 in cash and assume all outstanding bonds.

(Act 5). Committee makes final accounting and accounts for the \$220,000 in cash about as follows:

Compensation for fees and expense of counsel for Committee .....	\$50,000
Compensation of Committee .....	25,000
Compensation paid to Secretary of Committee .....	5,000
General expense including reports on property and all engineering services .....	11,000
Trustee in Bankruptcy .....	100,000
Taxes and Insurance .....	12,000
	<hr/>
	\$203,000

Amount for distribution to depositors of bonds..... 20,000

I was tempted to underscore certain items but it occurred to me on second thought that they might be construed as "contempt of court."

WASHES DIRT OFF COAL WITH WATER.—At the strip pit of the Harrisburg Coal Mining Co., Harrisburg, Ill., the overburden, 45 ft. thick, is removed by a large steam shovel and then the surface of the coal is scraped free of impurities. That done, the top of the coal is generously flushed with water from large reservoirs nearby. In this way the coal is rendered clean of overburden, but before it is cleaned of those impurities which go with the bed it passes over the screen and in so doing is thoroughly sprayed to move any overburden or bottom clay that by chance may have mixed with the coal.

BROWN COALS may be developed in various parts of the empire as a useful fuel, according to W. A. Bone, Professor of Chemical Technology at the Imperial College of Science, who, in an address to the British Association for the Advancement of Science in session in Toronto, pointed out that these coals are found in extensive deposits in the various colonies and dominions. He suggested that research by chemists and engineers will make it possible to utilize many of these reserves which are at present receiving little attention.



# How a Copper-to-Steel Bond Is Made, with Tests Proving Its Efficiency and Endurance

Direct Union of the Copper Terminal to Rail Provides High Electrical Conductivity—Mold Confines Heat to Terminal While Bond Is Being Formed—Copper Sleeve Protects Strands of Cable Against Breakage

By J. B. AUSTIN

Research Engineer, The Rail Welding and Bonding Co.,  
Cleveland, Ohio

**M**UCH PROGRESS has been made in the welding of copper to steel, in the design of bonds and molds and in the method of applying the all-copper bond. This process of welding copper to steel is well adapted to the bonding of mine tracks.

Each step in the development has been the outcome of careful tests in which the relation of any part of the process to the general problem has always been considered. In consequence of the many investigations, a simple, quick and reliable process has been evolved, providing a permanent electrical connection between rails that is cheaply and easily installed. As the sole object of the bond is to bridge the gap between the rails it seems only logical that this path should be copper. Such a bond is made by directly welding the all-copper bond terminals to the rail with copper.

In welding the terminal of an all-copper bond to the rail, it was soon learned that a mold was necessary in order to hold the weld metal in proper position in relation to the bond head. Copper melted under the electric arc is quite fluid, and without the mold it is impossible to retain the metal in contact with the rail. With such a mold, the bond is held in its correct position, relative to the rail, and the weld is confined to its proper limits. The casting is also compact and uniform in size. The metal can be positioned properly by the mold, the welder can focus his entire attention on the actual welding operation much improving the quality of his work.

The process of arc-welding copper to steel requires that the molten copper shall not only be held in contact with the rail but shall also be hot enough to bring the surface of the rail to such a temperature as will eliminate rust and scale and effect the weld. In building up a weld, it was found that the lower layers of copper were likely to chill against the rail. A refractory mold eliminated this chilling to a large extent by retaining the heat within the mold. Many materials were tested, and carbon was selected as the most suitable mold material because of its comparatively high electrical conductivity and its low heat conductivity. It was the only material tested which satisfactorily withstood the intense heat of the arc without mechanical failure or rapid deterioration.

## OLD PROCESS OF WELDING COPPER TO STEEL

The original process of welding consisted of melting scrap copper into a carbon mold by means of a carbon arc. In order to obtain a satisfactory weld with pure copper, it was necessary to direct the arc directly into the rail and to wash the scale oxide free so that the surfaces of the metals where in contact were clean. A weld was then made, but when the copper of such a weld was sheared from the steel, much porosity was noticed along the welding surface.

Further examination with the microscope showed that a weld of this type was of a questionable character. Between the copper and steel there was a rather wide brittle alloy zone in which were many fine hair-line cracks. This zone was in some cases  $\frac{1}{8}$  in. to  $\frac{1}{4}$  in. wide. The conclusion drawn from these tests was that any nicking or gouging of the rail was distinctly detrimental to the rail, as well as to the bond-head casting.

## COPPER-SILICON ALLOY MAKES BEST WELDING ROD

Extensive investigations were then made to obtain a flux or alloy which would eliminate the gases from the molten copper and reduce the oxide scale without what had been the inevitable gouging of the rail. Many different elements were tested as alloys, and probably 600 or more welds were made before a suitable element in the proper proportion was obtained.

As a result of this investigation, an alloy copper rod was developed which thoroughly eliminated the gases from the copper and from the surfaces between the copper and the steel. This rod contains a powerful deoxidizer which has the special advantages of reducing the oxide scale at a relatively low temperature, and of giving a resulting casting of relatively high electrical conductivity. This fluxing action permits clean degasified surfaces of copper and steel to come into intimate contact so that a weld can be made over the entire contact area.

In order to weld this copper-silicon alloy to steel it is only necessary to melt the alloy adjacent to the steel and play the arc upon it for a brief time. The rail is not gouged at any time, for the arc is played directly upon the copper. In shearing the weld metal from the steel, there is not the abrupt failure which character-

ized the rather brittle weld of pure copper to steel. Instead, the copper weld metal, which was dense, non-porous, fine-grained and ductile, sheared slowly. Microscopic examination of this union showed a distinct line of contact between the copper and steel. The alloy zone which joined the copper and steel when observed under high-power magnification showed that it varied but little

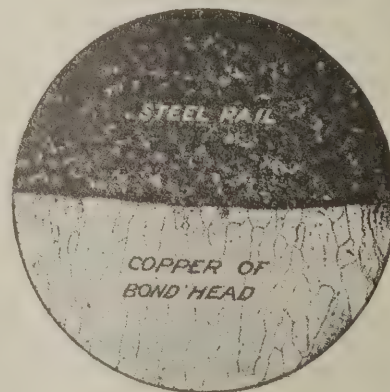
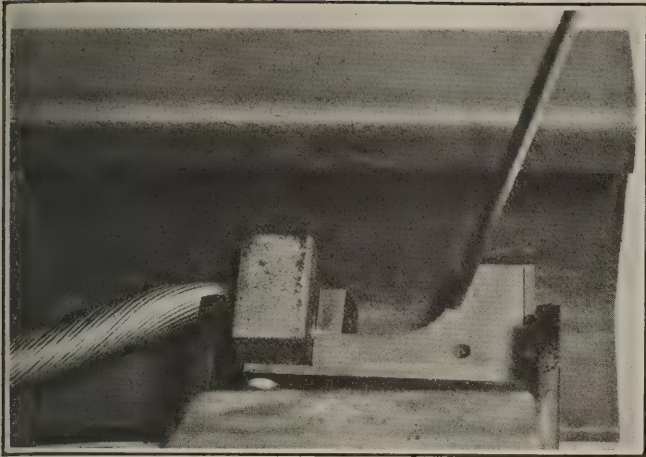


Fig. 1—Microscopic Structure

Photomicrograph of a copper-to-steel weld made with the new copper-silicon electrode. Note the absence of porosity and the uniformity of the union between copper and steel.





**Fig. 2—Mold in Position for Making Weld**  
A 4/0 base bond and mold are shown ready for welding. The mold holds the copper cable in place and retains the deposited metal. The arc is first drawn from the carbon mold.

in width. The hair-line cracks observed in previous welds made by the gouging process were entirely absent. Fig. 1 is a photomicrograph of a copper to steel weld made by this new process.

Two processes have been developed for applying all-copper rail bonds. The results obtained with either process are identical. They are known as the carbon-arc and the copper-electrode process. The former involves the use of a dynamotor which reduces the open-circuit voltage to about 60 volts, suitable for carbon-arc welding and sets up a local welding circuit with the rail of positive polarity and the carbon electrode of negative.

The alloy rod is then melted by means of the carbon arc. In the latter process either a dynamotor or a resistance welder is used, and the arc is drawn between the copper electrode and the mold. In the carbon-arc process, the electrode and the filler rod are separate, whereas in the copper-electrode process, they are one and the same. As the latter process is that used in the mines the rest of this article will be confined to a detailed description of the process as it has been developed for the application of mine bonds.

**ALLOY CLEANS RAIL OF SCALE AND RUST**

The process of applying a base bond may be described as follows: Excessive scale and rust are removed with a file or wire brush where the weld is to be made. It is not necessary to grind the rail as the alloy rod cleans the rail during the welding process. A current of 200 amp. is best for welding a 4/0 base bond.

Fig. 2 shows the position of the bond and mold ready for welding. The mold fits snugly against the web of the rail. This photograph also illustrates the use of the mold as a positioner for the bond.

The first step in the process is shown by Fig. 3. The arc is drawn from the carbon mold and with an arc length of about  $\frac{1}{4}$  in. the metal is deposited as indicated by the arrow starting at the extreme right. During this step, the first layer of metal is deposited and the weld to the rail is obtained.

The second step in the process is shown by Fig. 4, the pool of the first layer of copper is now attached to the cable. This is accomplished by directing the arc at the head of the bond on its lower side, near the rail flange.

The third and final step of the process consists of advancing the arc over the entire area and melting down the bond head and washing the copper against

the web as the molten pool of copper rises in the mold. The arc length may be  $\frac{1}{4}$  in. to  $\frac{3}{4}$  in. and still the results will be satisfactory. Fig. 5 shows the completed weld. In welding a 4/0 bond head by this process about 40 sec. is required to complete the entire series of operations.

**RESISTANCE LOWERED WHEN ALLOY WAS USED**

Resistance measurements were made of a number of bonds welded with pure copper and the silicon-copper alloy rod by the bridge method. Tests of the same bonds were made by the volt-ammeter method. The voltage drop was measured across the bond head on the center of the rail head with a current of about 275 amp. through the bond. Though this test is not as accurate as the bridge method the error is about the same for each type of rod and the results shown in Table I therefore are comparable.

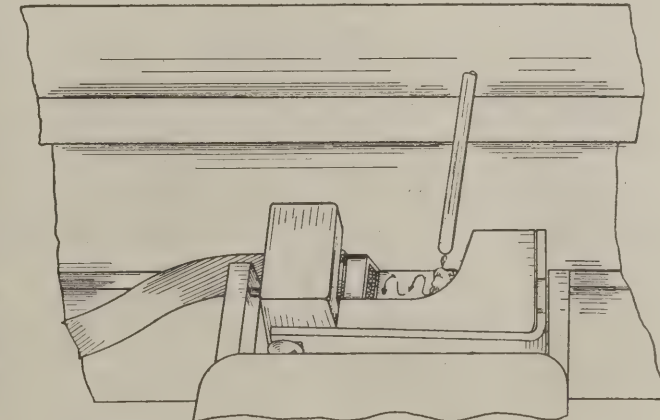
Table I—Resistance of Pure-Copper and Silicon-Copper Bonds			
Type of Rod	Number of Bonds Tested	Average Equipment Feet of 6-In. 100-lb. Rail	Volt-Ammeter Resistance of Bond in Ohms
Pure Copper.....	4	3.146	0.0000305
Silicon-Copper.....	4	3.042	0.0000294

The test shows that because of the elimination of porosity the use of the silicon-copper alloy slightly lowers the resistance. A small percentage of silicon remains in the finished bond head. The larger percentage of silicon in the original rod is used up in the reduction of the oxide. It is also interesting to note that of many of the alloys that might be used for welding copper to steel, the silicon-copper alloy lowers the electrical conductivity the least.

Comparative shear tests were made of pure-copper-to-steel welds and silicon-copper-to-steel welds. The bonds were welded to the head of a 6-in. 100-lb. T-rail. The bond heads were sheared in an Olsen universal testing machine of 200,000 lb. capacity. The results were as in Table II.

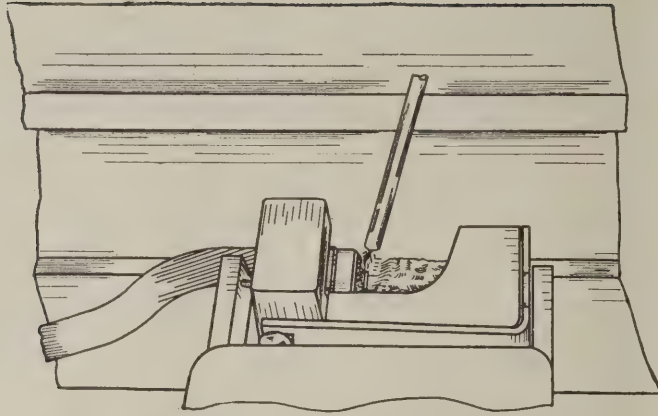
Table II—Shearing Strength of Silicon-Copper and Pure-Copper Bonds		
Type of Rod	Number of Tests	Average Shearing Strength, Lbs. per Sq. In.
Silicon-Copper.....	8	27,062
Pure Copper.....	6	17,380

The use of the silicon-copper welding rod increased the shearing strength of the bond head about 55 per cent. This increase in shearing strength of the weld is



**Fig. 3—Laying in the First Layer of Metal**  
The special electrode is used as shown and the metal deposited and welded to the rail. The arc used is about  $\frac{1}{4}$  in. long.





**Fig. 4—Welding Copper Wire to Deposited Metal**

In this step the first layer of copper is attached to the cable. This is done by directing the arc at the head of the bond near the rail flange.

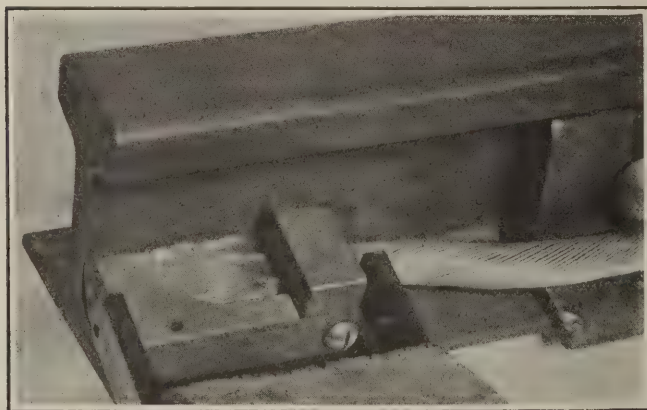
attributed to the elimination of porosity and to the general improvement in the union between the copper and steel.

The improvements in bond design have been accomplished largely through results of tests made by a specially constructed fatigue-testing machine. If bonds were placed in service in order to obtain an estimate of their fatigue life, much time would be required and the nature of the test would vary from one joint to the next.

In order to arrive at a proper bond design, it was deemed advisable to standardize a test and to construct a machine which would test the bond under the most severe conditions. The proper cable length, arrangement of strands, proper protection of the strands where they unite with the weld metal, etc., are all factors which are of vital importance in bond design.

The test was made as follows: The bond terminals were welded to steel plates which were attached to vertical arms actuated by cams on a rotating shaft. The position of the bond was similar to the position which it occupies relative to the rail in service. The maximum vertical relative displacement of the two heads was  $\frac{11}{16}$  in. which corresponds to an extremely severe service condition,—one, in fact, which seldom, if ever, exists.

The original all-copper bond has been greatly improved by the addition of a copper sleeve or skirt which gives a fillet effect to the bond where the strands unite with the weld metal. The fatigue stresses are distributed rather than concentrated at the strand-to-bond head union. Copper was found to be the best material



**Fig. 5—A Completed Weld of Copper**

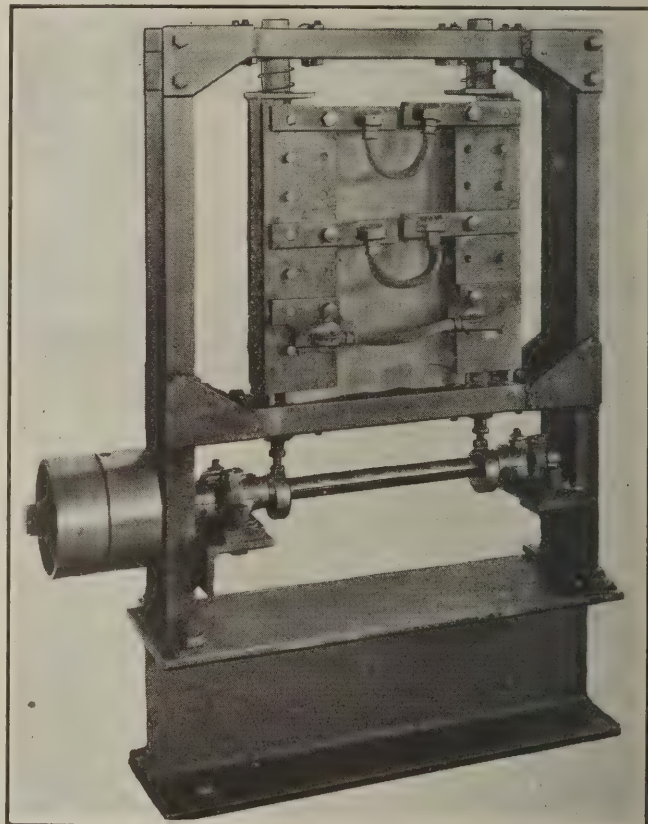
By advancing the arc over the entire area and melting down the bond head the molten copper is washed up against the web of the rail and the weld completed in about 35 sec.

for this protective skirt. The test has also made it possible to determine the best cable length and arrangement of strands. The improvements brought about by the addition of the copper skirt and by increasing the length of the original 6-in. 4/0 bond one inch is shown by Table III.

**Table III—Fatigue Test of Bonds With and Without Protective Skirt**

Type of Bond	Number Tested	First Strand Failure Vibrations	50 Per Cent Failure Vibrations
6-in. 4/0 Bond without Protective Skirt.....	2	220,500	420,000
7-in. 4/0 Bond with Protective Skirt.....	2	660,000	3,000,000

In passing over the rail gap, the car wheels strike the rail they approach with considerable impact. The magnitude of this impact is dependent upon the width



**Fig. 6—Bonds Tested Under Severe Conditions**

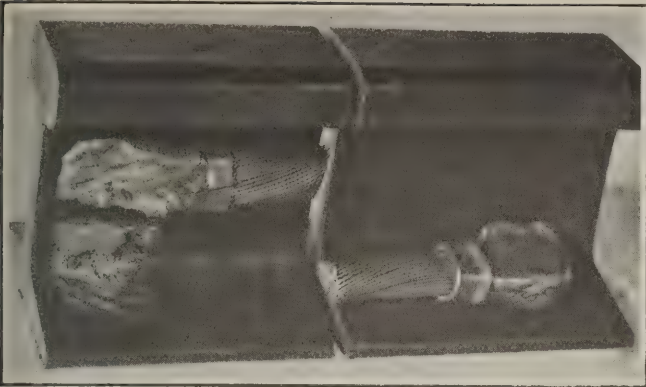
This machine consists of two cams which stress the bond and cable under conditions more adverse than in actual operation.

of the gap, the alignment of the rails, the surface alignment of the track and the general condition of the joint structure and roadbed. Cupped rails increase this pounding considerably. As the rail flange is in tension, failure would be likely to start in that member if it is weakened at all by the application of a bond.

In order to determine whether or not the welding of base bonds by the copper electrode process damaged the rail, the following test was devised: A weld was made at the center of a 25-lb. mine rail on the base near the web. The position of each weld and the size of the rail was the same in each case. The rail was then placed head up on a span support of 24 in. The supports consisted of rails placed on heavy oak blocks. The rail was subjected to the blow of a 250-lb. hammer falling 28 in. The hammer struck the center of the rail head directly above the weld.

The results of these tests are shown in Table IV.





**Fig. 7—How the Copper and Steel Are Joined**  
A homogeneous mass of copper forms intimate contact with the steel of the rail and produces a contact having low electrical resistance.

The results in Table IV show conclusively that the process used in welding all-copper rail bonds does not injure the rail. This is attributed to the fact that in welding silicon-copper to steel, the arc is not directed at the rail, but plays upon the molten copper. By this process, the heat is distributed rather than concentrated. Naturally, the residual internal stresses are much lower, and there is no notching effect under impact. The results obtained with the carbon-arc process and copper-electrode process are practically identical. The fact that a new 25-lb. bonded rail withstood five hundred 28-in. blows of the 250-lb. hammer and did

not fail after a deflection of  $\frac{11}{32}$  in. is convincing evidence of the quality of the copper-electrode weld.  
The rail joint is subjected to flexural as well as to impact stresses when the wheel load passes over the rail between ties. This stress becomes a maximum when the application is at a point midway between ties. In order to determine the resistance to flexural stresses of a mine rail with a copper-to-steel base weld, a special test was made. A 4/0 bond head was welded at the

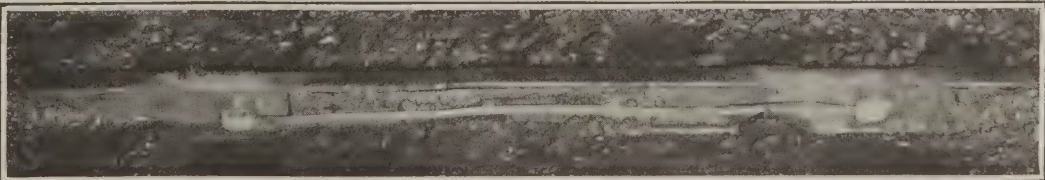
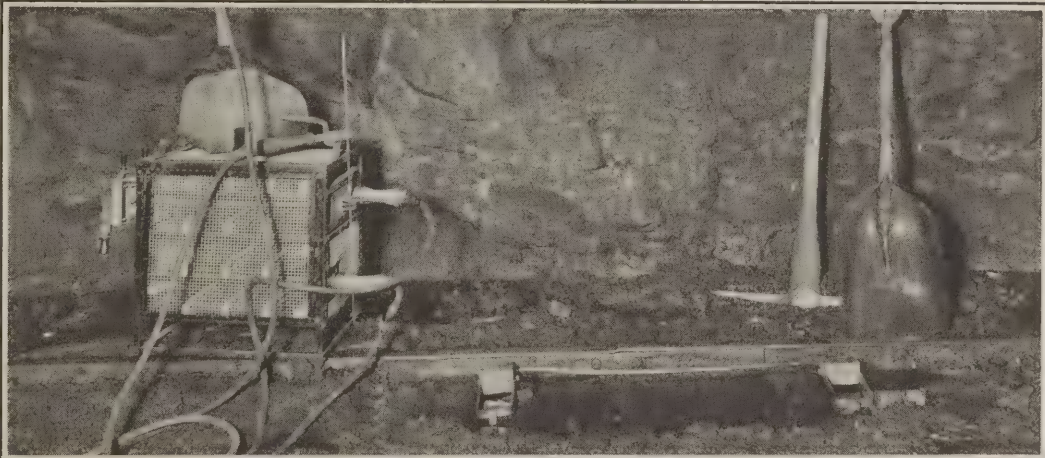
**Table IV—Impact Test of Bonds**

Type of Bond	Number Tested	Average Number of Blows	Average Final Deflection	Type of Rail
4/0 base Bond Copper-electrode Weld on Rail Base. New Process.....	3	500	21/32 in.	New 25-lb. rail
4/0 base Bond Copper-electrode Weld on Rail Base. New Process.....	3	100	5/16 in.	25-lb. rerolled
4/0 base Bond Carbon-arc Weld on Rail Base. New Process.....	3	100	$\frac{1}{2}$ in.	25-lb. rerolled rail
Rail with No Bond.....	3	100	7/32 in.	25-lb. rerolled rail

Note:—Failure did not occur in any case.

center of the rail on the base near the web. The rail was then placed head up on two steel supports with a span of 24 in. The load was applied at the center of the rail head directly above the bond head. Each specimen was given a maximum deflection of 2.6 in. Half of the specimens were welded with the carbon arc and half with the copper electrode. The results are indicated in Table V.

**Fig. 8**  
**Welding Stages**  
Excessive scale and rust are first removed in the usual manner by means of a file or wire brush. The alloy rod does most of the cleaning during the welding process. These illustrations show the equipment necessary for placing a 4/0 bond on the rail. When applying the bond the arc is directed upon the molten copper and the heat is thereby distributed rather than concentrated in a manner that would cause injury to the rail. The mold confines the heat and thereby aids in facilitating the application of the bond.





The severity of this test may be realized from the fact that measurements showed the width of the rail base and the rail height to have been reduced about  $\frac{3}{8}$  in. at the point where the bend occurred.

It is interesting to note that the percentage of failures of the unbonded and bonded specimens of rail

Table V—Test of Bonds Under Flexural Stress

Type of Bond	Number of Tests	Number of Failures	Percentage of Rail Failures
4/0 base bond, copper-to-steel type, welded to rail base by new process.....	36	4	11.1
Rail with no bond.....	12	1	8.3

were of the same order of magnitude. It is, therefore, fair to assume that the failures of the bonded specimens might have occurred if the rail had not been bonded. Considering the magnitude of the deflection, which is out of proportion to what actually occurs in service, the conclusion may be readily drawn that rails with all-copper bonds welded to the base, are practically unaffected by the welding.

## Darco, a Boneblack, Is a New Product of Lignite

Large Plant, Owned by Powder Company and Located in Texas Lignite Field, Will Make Sugar-Refining Charcoal

BY HOWARD C. MARSHALL  
Austin, Tex.

WITH the recent reopening of the \$1,000,000 plant of the Darco Corporation of Wilmington, Del., a subsidiary of the Atlas Powder Co., with a plant and mines at Marshall, Tex., lignite coal will be put to an entirely new use. The Darco plant is the largest establishment in the world for the making of decolorizing and deodorizing carbons from lignite coal.

Darco is a product new to the commercial world. Briefly, it is a decolorizing and deodorizing carbon which its manufacturers claim will take the place of boneblack in the refining of sugar. Its manufacturers claim that it will eventually replace that substance because it can be produced at the Marshall plant much cheaper than other sugar-clarifying agents.

Boneblack is a charcoal made by burning crushed bones. It purifies sugar liquids in the same way that a gravel filter will purify water, only much more thoroughly. The main steps in the manufacture of Darco are: First, the crushing of the lignite; second, the retorting of this crushed product to drive off the volatile gases; third, the treatment with hydrochloric acid to eliminate the ash. When ready for use, Darco and boneblack are much alike in texture and general appearance.

One of the big commercial advantages which the Darco manufacturers will have over their boneblack competitors is the fact that whereas bones are collected from all over the world and transported to the burning plants, the Darco raw product, lignite, is at the very door of the factory.

At the present time, the Darco Corporation owns 300 acres of lignite land ten miles south of Marshall, and holds option on several hundred additional acres. It has been estimated that there are approximately

10,000,000 tons of lignite in the company's holdings, practically all of which is of the proper quality, and is easily accessible for mining and manufacturing of the Darco. The estimated capacity of the big plant at Marshall is 150 tons of raw lignite daily, from which 25 tons of finished product can be made.

At present, the plant of the Darco Corporation consists in more than ten buildings, which cover a total area of 66,000 sq.ft. It is situated just outside the city limits of Marshall on a site of 85 acres, and on the main line of the Texas and Pacific R.R. The plant is served by approximately 3,200 ft. of track, over which the raw materials are brought in, and the finished product is shipped out.

Automatic conveying and handling devices are employed in the buildings, all of which are of fireproof construction. From the moment the raw materials is dumped from the cars until it emerges in neatly sealed and standardized packages of Darco it is handled entirely by machinery.

Babcock and Wilcox boilers and a 600-kw., turbo-generator equip the power house, which is itself of brick-and-steel construction. Superheated steam is generated in these boilers at 200 lb. pressure, passed through the turbo-generator, and then is carried at low pressure to the main plant where it is used in process work, thus generating electrical energy at low cost.

R. E. Demmie, a Belgian chemist, for a number of years conducted experiments with lignite coal, at Homer, La., looking toward the discovery of a new decolorizing and deodorizing agent to be used in the refining of sugar. He succeeded in interesting the Atlas Powder Co. of Wilmington, Del., in his experiments. A small experimental plant was constructed at Homer, and here it was proven that Mr. Demmie's discovery, Darco, could be made a commercial success.

Three things were essential to the place where the big plant should be built: Adequate transportation facilities, cheap fuel, and nearness to the raw product, lignite of a particular variety. Marshall had the transportation requirements, and it could get the fuel, natural gas. But at the time, it did not know that it had the lignite. More than two hundred test wells were sunk, and it was found that surrounding Marshall, particularly about ten miles to the southeast of the city, was one of the largest and richest lignite fields in the world. The actual discovery of the big field was made by Mrs. W. C. Martin, of Dallas, Tex., who was engaged in sinking a number of water wells on her ranch property in the Sabine River bottoms.

A 10-in. gas main was promptly laid from the Bethany-Elysian fields. This line can carry 20,000,000 cu.ft. of gas every twenty-four hours. It is estimated that the gas fields can produce a capacity of 100,000,000 cu.ft. of gas daily. The industrial gas rate is as low as 7c. per M. ft., this giving Marshall, it is believed, the lowest industrial gas rate in the Southwest. Domestic consumers of gas are supplied by the Texas Co. from another field.

The final consideration in the selection of Marshall was the fact that the city is approximately one hundred and fifty miles from Beaumont, two hundred miles from Houston and Galveston, and three hundred miles from New Orleans. The main difficulty which the Darco people have experienced so far, and will continue to experience, is getting the refineries divorced from the age old boneblack process.





# News Of the Industry



## Old Parties Would Boost Union Output To Nullify La Follette's Power

**Fear, Unemployed Miners May Vote for Third-Party Candidate—Increase in Work Likely to Influence Workers in Other Industries—  
Need of Statistics Emphasized**

BY PAUL WOOTON  
Washington Correspondent of *Coal Age*

A major effort is being made by each of the old parties to stimulate employment of coal miners in the union field. Unless some means can be devised to increase production in the Central Competitive region it is feared that many of the coal miners out of employment will vote for Senator La Follette for President. It is true that the returns to the U. S. Employment Service from Ohio, Indiana and Illinois show no significant amount of unemployment, but it is admitted there is large concealed unemployment in those states. This term is used at the Labor Department to indicate employment at a wage substantially less than the worker is capable of earning at his own vocation. The discontent engendered by employment under such conditions is almost as great as that which accompanies unemployment.

Since each of the parties is convinced that a majority of mine workers vote with it under normal conditions, there is a general desire among leaders to devise some means of increasing coal production in the doubtful states. While Illinois is not regarded as doubtful, there is the greatest uncertainty as to the political situation in Indiana and Illinois. There also is the consideration that the employment of a greater proportion of the coal miners will influence labor engaged in their pursuits. While each of the parties is equally anxious to do something to increase coal-mine employment, the Republicans happen to be in a position to accomplish more in that direction through their possession of the machinery of the federal government.

### Abandon Plan to Cut Wages

Two ways of increasing employment have been given consideration. One is the reduction of the union scale in the hope that this would reduce costs to the point where many mines could compete with the non-union product. The other is to induce consumers to increase their purchases. Since the politicians in charge of the campaign work are not thoroughly acquainted with the coal business, their first thought was that a reduction in the

wage scale would be all that is necessary. Since then they have been told that this would not necessarily increase employment to any great extent, as any cut in the union wage would result in a corresponding reduction at non-union mines. While it now is recognized that a reduction in the scale might not be productive of a great increase in employment there still is considerable sentiment in favor of such action. Some are of the opinion that the union leaders in their hearts would like to see this done, as it would make easier their task of extending their organization. It is known that a determined attempt is being made to win back some of the ground lost in Kanawha, New River and other fields. Wage levels in the non-union field already have reached the point where some complaint is being heard. If they were forced to new low levels by a reduction in the union scale, it would increase union sentiment.

### G. O. P. Would Speed Output

So far as the Republicans are concerned chief reliance seems to have been placed on an effort to speed up consumption. Some are unkind enough to say that the recent official pronouncements urging early coal purchases had a political motive. Whether or not that be the case it is declared that the word is being passed around to large industries that there is no better way to increase the Republican party's chance of success than to store coal at this time. It is being pointed out that here is a perfectly legitimate way to help the party and at the same time, in view of the probability of a severe winter, to take a prudent business step. Since this objective meets the thorough approval of the Democratic leaders, it is anticipated that they as well will encourage early buying of coal.

Incidentally, this movement does not have to exaggerate the situation to prove the advisability of coal purchases at this time. While it is unfortunate that the stock report cannot be made available before the first week in October, the figures covering production during the first eight months of the year now are available. Performance during the past two months has been

disappointing and has pulled down the year's average.

A month ago it seemed probable that 1924 production would aggregate 455,000,000 tons. It now has been necessary to revise that estimate downward. Even allowing for the average seasonal increase, it is difficult to figure how the 1924 production can exceed 442,000,000 tons. The lowest conservative estimate which has been made of 1924 consumption is 480,000,000 tons. Even if that low estimate is correct the probabilities are that stocks will not exceed 20,000,000 tons. Were the country's reserve to be reduced to that point, conditions would be ripe for a runaway market on any slight scare.

If 1924 production should not exceed 442,000,000 tons the extent of the depression in the industry can be realized in view of the fact that it is necessary to go back to 1911 to find a normal year with production at a lower rate. Production was lower, of course, in 1921-1922 because of post-war deflation and in 1914-15 because of the paralysis following the outbreak of the European struggle.

### Coal Statistics Needed

This entire situation emphasizes again the need for more coal statistics. It can be stated on high authority that more is known of nearly any other important commodity than is known of coal. It is true that the forthcoming stock report will meet the most crying need of the immediate situation, but before the coal business can be conducted entirely in the light much more should be known of distribution and consumption, to say nothing of statistics covering various other important phases of coal production and distribution.

The hope is entertained that the difficulties now being experienced by the political leaders in learning enough of the situation to determine how they may be able to increase coal-mine employment and be rewarded by grateful voters may bring home to those who have influence in legislative matters the need for additional appropriations for coal statistics, or at least statutory authority which would allow government bureaus to receive contributions from the industry for the purpose of augmenting the funds which they have at their disposal for statistical purposes.

In reporting on the application of the Coal River & Eastern Ry. for permission to extend its line to Prenter, W. Va., a distance of 11 miles, Interstate Commerce Commission Examiner C. E. Boles advised against granting the application.



## 152 Miners Killed in

### Mine Accidents in July;

7 Months Total Is 1,458

Accidents at coal mines in the United States during July, 1924, caused the death of 152 men, or 58 less than the number killed in July, 1923, according to information received from state mine inspectors by the U. S. Bureau of Mines. The production of coal during the month was 40,066,000 tons; hence the fatality rate was 3.79 per million tons of coal mined. This rate is lower than that for the preceding month (4.22) as well as for July last year (3.92), and it is about 10 per cent lower than the average rate (4.20) for July during the ten-year period 1914-1923. For bituminous mines alone the reports showed 112 deaths and a fatality rate of 3.47 per million tons, as compared with a rate of 3.55 for July last year and a ten-year average rate of 3.82. For anthracite mines alone, the number of fatalities in July, 1924, was 40 and the fatality rate was 5.14, as compared with 6.01 for July last year and a ten-year average rate of 6.36.

The accidents during July brought the total number of fatalities during the first seven months of 1924 to 1,458, as compared with 1,478 during the corresponding months last year. Because of the explosions during the present year and the lower output of coal, the fatality rate for 1924 to the end of

### Dominion Coal Co. Plans Equipment Financing

The directors of the British Empire Steel Corporation are seeking authority from the preferred shareholders of the Dominion Coal Co., a subsidiary, for an issue of \$15,000,000 of the coal company's bonds to provide further working capital and equipment, according to advices from Montreal. The new bond issue would be used to refund the \$4,988,000 outstanding bonds and provide \$5,000,000 to meet the existing indebtedness due to capital expenditures, and the balance would be issued from time to time for further capital expenditures.

When the preferred stock of the Dominion company was issued in 1905 it was provided that no new mortgage could be placed on the properties without the consent of 51 per cent of its stockholders. The president states that the new issue will put the shareholders in an advantageous position for the resumption of dividends.

July was 4.65 per million tons, about 19 per cent higher than the corresponding rate (3.91) last year. The increase in the fatality rate was entirely in the bituminous industry, as the rate for anthracite mines actually declined from 5.66 to 5.49, while that for bituminous mines rose from 3.58 to 4.48.

## Tardy Coal Buyers May Run Afoul of Car Shortage

While the railroads of the country appear to be in excellent condition to handle the fall crop movement, in the opinion of Secretary Hoover, there may be more or less slight conflict with coal movement, the Secretary stated last week in discussing the subject, owing to the fact that many consumers appear to have disregarded the advice to lay in their stocks during the summer. The Secretary, however, did not predict a car shortage as a certainty, touching upon the subject only in a general discussion.

The Department of Commerce issued its appeal to fuel consumers three months ago to lay in their winter supplies of coal during the summer months, Secretary Hoover said, in order to forestall congestion in transportation when cold weather arrived, in order to level operating time at the mines and in order that consumers might benefit from the lower prices of summer. If a car shortage develops, it inevitably means higher prices for coal, he pointed out. Coal this summer has been cheaper than since 1916, Secretary Hoover said, adding that in his opinion some bituminous coal has been sold at a loss. The advice to stock during the summer was heeded by many consumers, the Secretary said, but was disregarded by many more, as evidenced by the fact that coal production this summer has been at the lowest rate in years.

## Coal-Mine Fatalities During July, 1924, by Causes and States

(Compiled by Bureau of Mines and Published by Coal Age)

State	Underground										Shaft				Surface					Total by States						
	Falls of roof (coal, rock, etc.).	Falls of face or pillar coal.	Mine cars and locomotives.	Explosion of gas or coal-dust.	Explosives.	Suffocation from mine gases.	Electricity.	Animals.	Mining machines.	Mine fires (burned, suffocated, etc.).	Other causes.	Total.	Falling down shafts or slopes.	Objects falling down shafts or slopes.	Cage, skip, or bucket.	Other causes.	Total.	Mine cars and mine locomotives.	Electricity.	Machinery.	Boiler explosions or bursting steam pipes.	Railway cars and locomotives.	Other causes.	Total.	1924	1923
Alabama	5			1								7													7	4
Alaska																									0	0
Arkansas	1											1													1	0
Colorado		1	2									3													3	8
Illinois	1		5	5								11													11	12
Indiana	2							1				3													3	7
Iowa																									0	0
Kansas																									0	1
Kentucky	1											1													1	13
Maryland																									0	0
Michigan																									0	3
Missouri																									0	2
Montana			1									1													1	0
New Mexico	1											1													1	0
North Dakota																									0	0
Ohio	6		2									8													8	12
Oklahoma																									1	0
Pennsylvania (bituminous)	14	4	2	10			2				1	33		1			1						2	2	35	48
South Dakota																									0	0
Tennessee					1							1													1	0
Texas																									0	0
Utah	1											1													1	0
Virginia	4		2									6													6	0
Washington	1	1		1								3													3	1
West Virginia	13	1	7		2		3					26								1			1	2	28	42
Wyoming	1											1													1	5
Total (bituminous)	51	7	21	17	3		7					107		1			1		1				3	4	112	160
Pennsylvania (anthracite)	16	1	4	*1	8							37							1				2	3	40	50
Total, July, 1924	67	8	25	18	11		7					144		1			1		1				5	7	152	210
Total, July, 1923	98	18	43	5	8		10	1	2			192	3		4		7	3	1	1		2	4	11		

\*Gas explosion.



## Scotts Run Mines Resume On Open-Shop Basis

The Brady-Warner Coal Corporation last week posted a notice announcing that operations at Osage mines No. 1 and No. 2, near Morgantown, W. Va., in the Scotts Run field, would be resumed Tuesday, Sept. 2, under the 1917 wage scale. It has been stated that the mines will be run on an open-shop basis. The Osage mines are rated as having a capacity of 1,600 tons daily and it is stated that this can be increased to 2,000 if necessary. The company has 67 miners' houses at the mines, 62 of which are now occupied by miners formerly in the employ of the company, before it closed its Osage plants last spring after declining to renew its agreement with the union. It is stated by Superintendent Warren Cook that the order calls for the miners either to go back to work or else vacate the company houses.

The 1917 wage scale calls for 63c. a ton for room coal and 69c. for entry coal. The scale for drivers and motor-men is \$4.52 for eight hours, although at one time the operators gave these men \$1 more.

The agreement between the company and the miners now occupying the houses belonging to it stipulates that if for any reason whatsoever the coal company desires the houses in which the miners live, the miners must vacate on five days' notice, but if the miners leave the employment of the company or are discharged they may be removed at once.

It has been predicted by various coal operators in the Monongalia field that if the Brady-Warner corporation opened its mines at Osage on the open-shop basis several other mines along Scotts Run now closed would open on the same basis.

Officials of the United Mine Workers in the Monongalia field declare that they will remain in the field until it is organized 100 per cent for the union.

## Keen Competition Marks Bids On Navy Coal

Keen competition marked the bidding on 8,000 tons run-of-mine bituminous coal for delivery at the navy supply depot, South Brooklyn, N. Y., between October and May next. Proposals were opened by the Bureau of Supplies and Accounts of the Navy Department, at Washington, Aug. 29, when twenty-one bids were received, as follows:

A. K. Althouse Co., Philadelphia, \$5.34 per ton; W. H. Bradford & Co., Philadelphia, \$5.42; Brinker Coal Co., Johnstown, Pa., \$5.81; Davis Coal & Coke Co., Baltimore, \$6.05; Dexter-Carpenter Coal Co., Inc., New York, \$5.57; Eastern Fuel Co., Pittsburgh, \$5.55; Empire Coal Mining Co., Philadelphia, \$6.03; Fallen Timber Co., New York, \$5.35; Fidelity Coal Mining Co., Philadelphia, \$5.65; H. B. W. Haff, New York, \$5.92; George D. Harris & Co., New York, \$5.98, alternate bids \$5.71 and \$6.05; Imperial Coal Corporation, New York, \$5.97; W. A. Marshall Co., New York, \$5.93, alternate bid \$6.16; Morrisdale Coal



Wide World Photos

C. P. White

New head of the coal division of the Department of Commerce. Mr. White's wide experience and knowledge of the coal industry are expected to be of great help in building up the influence of the division.

Co., Philadelphia, \$5.87; Pattison & Bowns, Inc., New York, \$5.94; Patton Coal Co., Fairmont, W. Va., \$5.99; Seaboard Fuel Corporation, Philadelphia, \$5.99; J. Tatnell Lea & Co., Philadelphia, \$5.49; Titan Fuel Corporation, New York, \$5.88; Weston, Dodson Co., Inc., Bethlehem, Pa., \$5.98; West Virginia Coal & Coke Co., Elkins, \$5.68.

## Steel Industry Speeds Up

Not since the early days of the year has steel demand been so brisk as it is now. Plans are announced for the reopening of mills and furnaces and the prospect is bright.

There is every indication that one of those rare periods in which all the railroads seem to turn buyers at the same time is in prospect. There is already in the market inquiry for between 150,000 and 200,000 tons of rails, and at least 250,000 tons of business is expected to be realized in the next few days. Southwestern roads thus far have done most of the shopping, although Eastern lines are beginning to come in. As yet the Western roads have not come into the market.

One of the best indications of the trend is the announcement that the United States Steel Corporation will reopen the largest rail mill in the world, located at Gary, the day after Labor Day. This mill has been idle for two months.

The railroads are not the only present buyers, however. Practically every consumer of steel products, with the single exception of automobile builders, is in the market with a buying zest that has not been experienced for some time. Farm implement makers are especially active, and considerable tonnage is being taken by makers of tanks and stoves.

## Chemists to Discuss Fuels At Cornell University

In the issue of Aug. 21, p. 263, *Coal Age* published an account of the meeting of the American Chemical Society to be held at Cornell University, Sept. 8-13. The program has been revised and lengthened, as follows:

Wednesday afternoon, Sept. 10, Rockefeller Hall—(1) F. W. Stevens, "The Rate of Flame Propagation and the Mass Law" (lantern); (2) R. T. Haslam, W. G. Lovell and R. D. Hunneman, "Radiation from Nonluminous Flames" (lantern); (3) F. W. Sperr, Jr., "The Present Trend of the Manufactured Gas Industry"; (4) N. H. Memory, "Notes on Continuous Vertical Retorts"; (5) R. T. Haslam, F. T. Entwistle and W. E. Gladding, "Reactions in the Fuel Bed" (lantern); (6) R. T. Haslam and E. L. Chappell, "The Measurement of Temperature of Flowing Gases" (lantern); (7) T. E. Layng and W. S. Hathorne, "The Determination of the Temperatures of Plasticity, Maximum Pressures and Solidification of Coking Coals" (lantern); (8) H. J. Rose and G. G. Desy, "Composition of the Volatile Matter Obtainable from Coke" (lantern); (9) T. E. Layng and W. S. Hathorne, "An Examination of the Methods of Analysis of Fuel Gas" (lantern); (10) E. C. Freeland and W. G. Harry, "The Use of Alcohol and Alcohol-Ether Mixtures as Motor Fuels"; (11) S. W. Parr and W. R. King, Jr., "The Density of Carbon Dioxide with a Table of Recalculated Values" (lantern); (12) Jerome J. Morgan and Merl H. Meighan, "An Investigation of the Caustic Soda Process of Extracting Low-Temperature Phenols."

Thursday afternoon, Sept. 11, Storage of Coal and Spontaneous Combustion; S. W. Parr, Chairman—Discussion started by (1) S. W. Parr and R. T. Milner, "The Oxidation of Coal at Storage Temperatures" (lantern); (2) S. W. Parr and E. R. Hildgard, "The Oxidation of Sulphur as a Factor in the Storage of Coal" (lantern); (3) S. W. Parr and C. C. Coons, "Carbon Dioxide as an Index of the Critical Oxidation Temperature for Coal in Storage" (lantern); (4) S. W. Parr, "Deterioration and Spontaneous Combustion of Coal in Storage" (lantern); (5) N. R. Beagle, "Deterioration of Midwest Coals under Different Storage Conditions—Effect on Burning Qualities"; (6) J. D. Davis and John F. Byrne, "Spontaneous Combustion of Coal—Characteristics Shown by an Adiabatic Calorimeter" (lantern).

The coal consumed by different manufacturing enterprises during 1923, as shown by the Department of Commerce, is as follows: Watchcase manufacture, 16,427 tons; baking powder and yeast, 246,963 tons; boot and shoe findings, 25,626 tons; bicycles, 25,505 tons; phonographs, 158,047 tons; motorcycles, 12,504 tons; glue and gelatine, 424,845 tons; paper bags, 19,641 tons; engraving plate printing, 3,100 tons; engravers' materials, 910 tons; cast-iron pipe and fittings, 170,497 tons; leather belting, 9,604 tons.



## Urge Safety Inspector for Each Anthracite Colliery

Scranton, Pa., Aug. 29.—A safety inspector for every colliery in the anthracite region is the desire of the Anthracite Safety Council as expressed in resolution form at a meeting in the Glen Alden Coal Co. offices in this city on Aug. 27. Copies of the resolution indicating the attitude of the council are to be printed and mailed to every operation in the region.

The resolution which provides for the safety inspectors specifies that the man appointed to such a position at each colliery must have had at least ten years experience in mining. He is to have authority to enforce discipline relative to mine laws and company rules. At the end of each work day the safety inspector will meet with the colliery superintendent, mine foreman, or assistants and representatives of the miners to discuss local conditions, according to the resolution. The inspectors would be paid by the coal companies.

P. J. Moore, state mine inspector for the Second District, presided at the meeting of the safety council. John R. Bryden, of the Pancoast Coal Co., acted as secretary. Others in attendance were August McDade, Jenkin T. Reese and Llewellyn Evans, state mine inspectors; T. J. Williams, of the Glen Alden Coal Co.; H. T. McMillan and J. Palmer, of the Pennsylvania Coal Co.; John Corcoran and Thomas Shrive, of the Jermyn Coal Co.; Morgan Davis, of the Mt. Jessup Coal Co., and James Gleason representing the United Mine Workers. The miners' local unions are to receive copies of the resolution and consider the advisability of the adoption of such a move.

The meeting was the third within the past three months for the purpose of devising ways and means of reducing fatal as well as minor accidents at the mines.

## Conciliation Board Urges \$5 Scale in Alberta

The report of the Board of Conciliation appointed under the Industrial Disputes Act to investigate the dispute between the coal operators of northern Alberta and the Edmonton and District Mining Federation recommends the following scale of wages:

Miners on company work, \$5 for an eight-hour day; brushers, track layers, drivers and chief cager, also \$5 a day; pushers and assistant cagers, \$4.50 a day; coupler (under 18 years), \$3.50 a day; assistant track layer, \$3.50 a day; boys under 18 on surface, 35c. an hour; outside labor, 50c. an hour; blacksmith, 65c. an hour.

The miners asked \$5.60 per day. The operators in the dispute were prepared to pay \$5 per day.

The board recommended that contract rates in the different mines be continued as they were in the agreement that expired on June 30, 1924, with provision for no overcrowding of contract miners during busy seasons.

Some of the independent mines in Alberta are now working, having effected an agreement with their men, and are shipping coal to Winnipeg.

## H. F. Randolph, Well Known Electrical Engineer, Dies

Harry Fitz Randolph, widely known in the coal industry as an electrical engineer, died at Mt. Hope, W. Va., Aug. 23, 1924. He was born at Johnstown, Pa., in 1871, and was educated at Swarthmore College and Johns Hopkins University. After graduation he immediately entered the students' course of the General Electric Co., Schenectady, N. Y., and after completing the three years' work required, was employed by the Yough River Coal Co. at Scott Haven, Pa., as chief electrician. When this company was merged with the other constituent companies forming the Pittsburgh Coal Co.



Harry Fitz Randolph

Mr. Randolph was retained as electrical engineer. He was later made assistant manager of mines, which position he retained until 1910, when he went into consulting work with George Wood as the Wood-Randolph Co. at Pittsburgh, Pa. Reorganization in 1912 changed the name to the Randolph-Means Co., which arrangement endured until 1917, since which time he had maintained an engineering organization under the name of Harry F. Randolph. During his professional career Mr. Randolph was retained by many large coal mining corporations throughout the country, notably the New River Co., Macdonald, W. Va.; H. C. Frick Coke Co.; Logan County Coal Corporation, Lunda, W. Va.; Wayne Coal Co. and Union Collieries Co. He had also been retained by the Department of Mines of Pennsylvania, Department of Mines of West Virginia and Federal Bureau of Mines.

### Escaped Johnstown Flood

He was a survivor of the Johnstown flood in 1889, in which his oldest brother was lost. Mr. Randolph was a member of the Engineers Society of Western Pennsylvania, the American Mining Congress, the American Institute of Electrical Engineers and other scientific organizations.

## Brophy Scoffs at Plan For Prosperity Through Less Money for Miners

"Give the miners less money and make their community more prosperous! This is, in substance, the theory many coal operators are now advancing, by the constant issuance of 'wage adjustment' propaganda. This is especially true of Central Pennsylvania Operators, Charles O'Neil acting as their press agent," said John Brophy, president of District 2 (central Pennsylvania), in commenting on the statement issued by Mr. O'Neil following the meeting of central Pennsylvania operators, at Altoona, Aug. 22.

"Coal production has been at the lowest level in years," said Mr. Brophy. "Consumers are not buying coal. Operators are not able to sell coal at any price because consumers do not want coal and will not buy it until they need it. Coal prices are now down to the lowest point in many years, still there is very little market.

"The reason for the operators' frantic efforts to set aside the present contract is therefore obvious to any one who dares to look into the matter. They are seeking to bring about a wage reduction when business is poor, so that when business improves and they are able to sell their coal they will make larger profits by reason of the reduction in wages to their employees.

"Mr. O'Neil's statement quotes many figures. He has counted up every hole in the ground that ever produced a bucket of coal and employed a couple of men to get his grand total of idle mines in District No. 2. The U. S. Geological Survey figures are just as reliable as Mr. O'Neil's (with the odds in favor of the Survey). If the Survey does not report the number of idle mines in the union fields, neither does it report the number of idle mines in the non-union fields, which fact Mr. O'Neil carefully fails to state.

"Mr. O'Neil is very much in error when he quotes the district officers as saying that the International officers are responsible for high wages in the union fields and low wages in the non-union fields. The International and the district officers are in complete accord on the wage question and I have told them that wage reduction is not a remedy for slack work; that wage reductions in the union fields mean further reductions in the non-union fields, and the result is no change in the relative position of the different districts, but it does mean less earnings and more poverty for the miners. The operators would not be benefited, but the mining communities would suffer more because the miners would suffer more.

"In March the operators were voluntary signers to an agreement for a three-year period. The ink of their signatures was scarcely dry before they started what might be termed an 'educational campaign' through the newspapers to sell the wage-reduction idea.

"The United Mine Workers have not been deceived by these specious arguments, but knowing their fallacy, intend to hold the operators to the Jacksonville agreement."



## Western Kentucky Mines Unable to Open On Non-Union Basis

Scheme Proves Abortive When Miners Stay Away—Failure of "Invitation" to Workers Attributed to Garbled Story in Louisville Newspaper—Plan Called Fight Against Union

Efforts of the western Kentucky coal operators to reopen the mines in the strike zone of District 23, on Aug. 25 failed completely. No workers showed up when the mine whistles were blown, following posted notices and letters mailed to the workers. Reports indicate that at most of the mines no men reported for work, groups forming in some cases to see whether there would be anyone reporting. Indications are that some workers would have reported except for fear of personal violence.

Operators of the section assert that the effort was largely frustrated through the activity of a Louisville newspaper, which got wind of the plan, obtained a garbled report, and came out with a headline article indicating that the operators had arranged to fight the miners and the union. It is asserted that when copies of the paper reached the central Kentucky district the workers went up in the air, and the good work of months was destroyed immediately, as the story merely made the workers mad. The word "fight" as used indicated to workers that an effort would be made to run, to destroy the union, import non-union men, and use every legal effort, even to guns and bayonets, if necessary.

The operators merely offered the 1917 wage scale and an opportunity to work if the strikers desired to do so. It was felt that after more than four months of idleness many workers would be glad of a chance to return to work, especially in view of the fact that there has been a considerable amount of complaint over strike benefits paid by the union.

The operators have steadfastly endeavored to show the workers that the Jacksonville agreement was to the detriment of the west Kentucky field and that the field could not operate profitably on any such basis, give its workers steady work, and keep out of the sheriff's hands. An effort also has been made to indicate to the workers that they were being used to aid in forcing an agreement that would help the Illinois, Ohio and Northern operating sections in maintaining union gains, but which would mean idleness for western Kentucky except in periods of shortage and high prices.

The argument is made that at the Jacksonville conference it was openly stated that there were 200,000 too many miners in the country, too many mines, too much potential capacity, etc. The only way to better conditions for the national organization would naturally be to eliminate a lot of workers, and some of the smaller fields such as west Kentucky.

It is rumored in the field that the International has supplied only about \$7,500 in the way of strike benefits other than a fund of around \$50,000 loaned to District 23 and to be paid back later on, although the district

union has been in operation for many years and has paid large sums into the coffers of the International.

Just what the next move will be is a question. Apparently workers are of the opinion that with fall business close at hand the operators were bluffing in offering the 1917 scale and will make a better proposition later. There is a possible chance that the operators will modify their offer and propose the 25 per cent reduction that was offered at Louisville five months ago. It seems that some of the workers objected especially to the fact that the recent offer was not as good as that previously made, but the previous offer was made on the understanding that the mines would not close down.

Eviction proceedings have been started in some sections of the field at mines that have been able to resume with part of their old forces and which are now endeavoring to rid their camps of strikers who refuse to return to work.

It is reported from Henderson, Ky., that practically all of the mines in that county are again running, and on a non-union basis, the Southland Mining Co. having started on Aug. 21, with thirty men, working one section, almost twice that number reporting for work.

The eleven mines of the St. Bernard Mining Co. are all reported to be on a working basis now—non-union with an employees' benefit association—although they are getting only 40 per cent running time. These mines were turned non-union after they were absorbed by the West Kentucky Coal Co.

### Safety Council Has Meat For All Comers

Last week *Coal Age* detailed the program of the Mining Section of the National Safety Council Congress, to be held at the Hotel Brown and Seelbach, Louisville, Ky., Sept. 29 to Oct. 3. Reference also was made to the annual business meeting. However, there are some other meetings that have relevance to coal-mine operation which were omitted, namely, some general sessions and those of the health service and plant-publication sections.

At 2 o'clock Wednesday afternoon C. F. N. Schram, M.D., medical director, Fairbanks, Morse & Co., Beloit, Wis., will discuss "Industrial Health as a Purchasable Commodity"; Mrs. Frank B. Gilbreth, Montclair, N. J., "The Fatigue Problem in Industry"; A. W. Colcord, M.D., Carnegie Steel Co., Clairton, Pa., "The Health Education of Our Foreign Families"; C. L. Ferguson, M.D., Selby Shoe Co., "How to Make a Sanitary Survey of an Industrial Plant," and A. D. Pacini, M.D., Chicago, Ill., "Physiotherapy and Physio-logical Reconstruction."

On Thursday morning at 10 o'clock the employees' benefit association section will hold a session at which Dr. A. H. Ryan, professor of physiology, Tufts College, Mass., will discuss "Benefit Associations—Their Need, Scope and Possibilities"; J. E. Culliney, safety engineer, Bethlehem Steel Co., Bethlehem, Pa., will answer the question "Should the Management Have Anything to Say in the Running of a Mutual Benefit Association?" and Dr. Wade Wright, assistant medical director, Metropolitan Life Insurance Co., will consider the problem "Should Medical Service of a Mutual Benefit Society Extend Beyond the Work Done in the Plant?"

In the afternoon at 2 o'clock Dean K. Brundage, U. S. Public Health Service, Washington, D. C., will address the employees' benefit associations section on "Statistical Analysis of Sick Benefit Association Records," and Albert B. Tenney, president, Malden Electric Co., Malden, Mass., will discuss the question "Should Physical Examination Be Compulsory to the Members of a Mutual Benefit Association?"

A general session will be held Thursday afternoon at which C. B. Auel, Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa., will discuss "Accident Records and How to Keep Them"; Frank Morris, Liberty Mutual Insurance Co., Boston, Mass., will address the audience on "Safety Committees Will Starve Unless Fed"; R. T. Solensten, bulletin editor, National Safety Council, will describe "How to Advertise the Big Idea"; H. O. Houze, personnel manager, National Malleable & Steel Casting Co. will show how to educate the workman, and Sydney W. Ashe, General Electric Co., Pittsfield, Mass., will detail "Personal Experiences with the Prone-Pressure Method."

On Tuesday evening both ladies and gentlemen will have a jollification party entitled "The Frolics of 1924," and on Thursday evening will be held the annual banquet with Herbert C. Hoover, Secretary of Commerce, as principal speaker, and an address on "The Responsibility of Leadership," by Dr. Augustus Dyer, Vanderbilt University, Nashville, Tenn. All these meetings will be at the Hotel Brown.

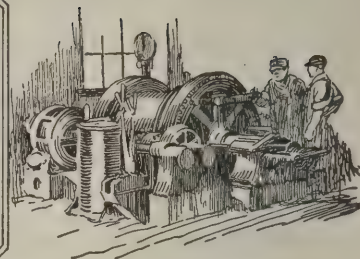
Nothing has been said as to the plant publications section, which meets in two sessions on Thursday, or the public utilities section, so near akin to the mining section, that meets on Tuesday, Wednesday and Thursday mornings, or as to many other sections of less interest to the industry. The plant publications section gives three prizes to the three best employees' magazines, of which there are more than three hundred, and to the companies presenting the best safety posters.

Seven motion pictures will be shown daily from 1 to 2 p.m. in the Hotel Brown, among others being "When a Man's a Miner," produced by the Bureau of Mines. Eighteen manufacturing concerns will exhibit safety appliances in the Hawaiian Building, opposite the Hotel Brown. It is probable that other mining meetings will be held to arouse an interest in safety in the west Kentucky field similar to those held in St. Louis recently.





## Practical Pointers For Electrical And Mechanical Men



### Motors Successfully Dried Out After Five Days Under Water

Although Submerged in Water All the Important Electrical Equipment  
Was Dried and Again Placed in Service Without a Mishap  
—One Motor Was Dried Electrically

**A**FTER being completely under water for a period of five days, five 1,000-hp. pump motors in the main pumphoom of the Glen Alden Coal Co., in Scranton, Pa., were successfully dried and placed back in service.

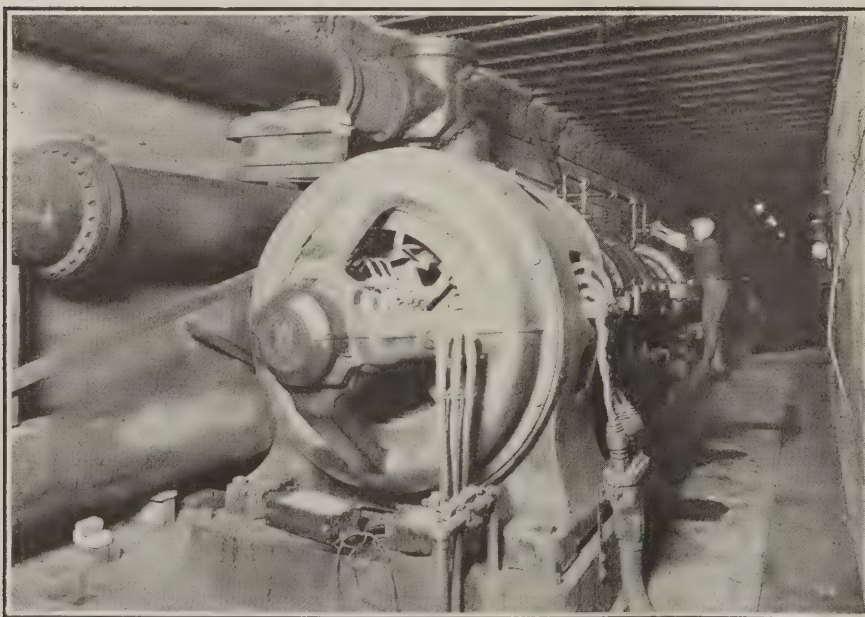
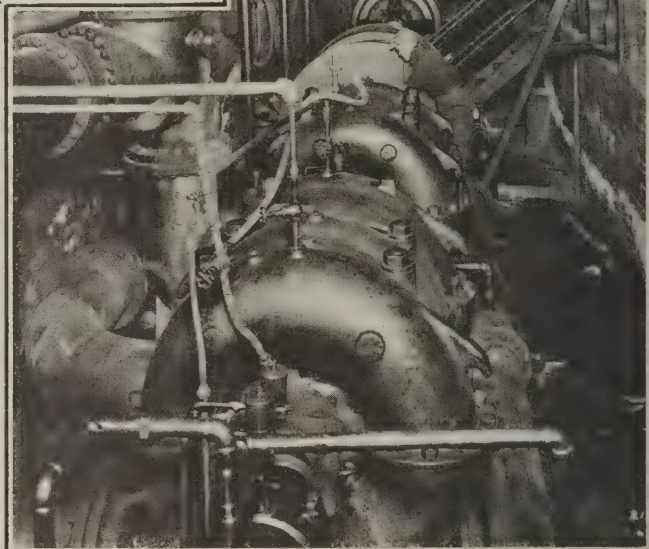
A flood from the Lackawanna River entered one of the collieries at the rate of 700,000 gal. per minute. The Hampton Water Shaft Pumping Station served this draining area with five centrifugal pumps, each driven by a 1,000-hp., 2,200-volt, three-phase, 60-cycle, 870-r.p.m. induction motor, four of which were Westinghouse motors.

In spite of the large capacity of the pumps, at the end of six hours, the pumps and motors were completely submerged. The water finally rose about 25 ft. over the tops of the motors.

It was five days before any of the pumps could be reached, and the pumps and motors were found half buried in mud and silt, several hundred tons of which had to be removed before any

#### Large Pumphoom

After the water was lowered, workmen entered the pumphoom and found the pumps and electrical equipment half buried in mud and silt. The motors had been in water five days, yet, when carefully dried out, all five motors were put back in service and gave no trouble. Note the large discharge pipes and how they were reinforced after the flood.



Some of the Largest Centrifugal Mine Pumps in the Coal Field Are Located in the Hampton Pumping Station

At this pumphoom all the water from five mines and most from three other mines is pumped to the surface. Each pump is driven by a 1,000-hp. alternating-current motor. This illustration shows the pumps in service after the flood. The pumphoom is the largest in the mining field. Power is supplied from one of the company's big generating plants located nearby. Incidentally, much of the mine water is used for cooling purposes in the power house.

of the pumps could be placed in operation. One by one the motors were disengaged from the pumps and taken outside, with the exception of one motor on the pump farthest from the entrance to the pumphoom.

These motors were disassembled, cleaned off with a fire hose, and dried in a temporary wooden inclosure built around them. This housing was open at the bottom and ventilated at the top, and a temperature of 90 deg. C. was maintained by circulating steam through coils of pipes inside the inclosure. This arrangement required little attention and gave a constant temperature.

The motors were dried in periods ranging from seven to eleven days until insulation resistance measurements showed a constant value for a period of twenty-four hours or longer. After being thoroughly cleaned out, painted, and the swollen slot wedges trimmed, the rotor windings were put back and the motors placed in operation again. They have been in service since that time and have given no trouble.

One motor which was left inside the mine was covered with a wooden house and dried by Westinghouse space heaters. Small fans gave the necessary ventilation. This job required closer attention and took longer to dry than



the other motors, but it obviated the necessity of taking the motor outside. The starting panels, oil switches, and all other apparatus were put in service after being cleaned and dried by blow torches and space heaters. The only failure of the entire outfit was a short piece of cable stretching from a bus-bar to one of the oil switches.

## Electrical Forge Saves Workman's Time

Anyone who has ever worked around an underground repair shop has no doubt often realized how inconvenient it is to make a repair when some part of the material had to be heated. Usually the workman finds that the part must be taken outside to the blacksmith shop.

If the mine has only one shaft it is frequently necessary to wait until the trammers can stop the hoisting of coal to let the workman get to the surface. Even when the material reaches the blacksmith shop there is often further delay if other work is being done in the fire.

### NO NEED TO BUILD FIRE

Repairs which must be made at night when the blacksmith's fire is out and a new fire must be started, and, moreover, by someone inexperienced with the forge, cause many troubles and dangers. Usually when the blacksmith comes to work the next morning he finds things misplaced, thus effectively lowering the efficiency and morale of the shop. Aside from these difficulties the losses occasioned by delays to the workmen and equipment can never be retrieved.

At the J. K. Dering Coal Co. mine, at Eldorado, Ill., the inside workmen who repair locomotives, cutting machines and other mine equipment have often felt the need for some means of heating bent bolts and small machine parts. Old methods didn't suit them; when mining machinery has to be repaired all the work must be done quickly. When a man is under a locomotive it is no easy matter to crawl

from under it and back again for every little detail; this wastes time. While an assistant is going outside to heat and straighten a bolt, no man is going to wait in a cramped position in a dark, and sometimes wet, motor pit.

To obviate these delays and difficulties the workmen employed in the repair shop near the foot of the shaft at this mine have built their own forge. The unusual thing about it is that it operates by electricity supplied from the main trolley circuit. Every precaution has been taken to make it as safe as possible and in this respect it is different from most contraptions designed in coal mines.

### FREE FROM GAS AND SMOKE

When not in service the forge generates no gas or smoke to fill the workshop and make things disagreeable. It stands in a separate little room to the side of the shop.

The essential part of this forge is a barrel filled with salt water and provided with necessary protective equipment. The barrel is mounted on an insulated platform upon which the workman stands and keeps himself free from ground connections. The positive conductor from the trolley circuit first passes through a disconnecting switch located near the forge. On the end of this lead a metal plate has been fastened and placed in the bottom of the barrel. The negative conductor is attached to an insulated busbar fastened to the top of the barrel.

By insulating the platform from the ground and also insulating the negative conductor from all parts of the forge the whole equipment is made relatively safe. A workman standing on the platform does not get a shock if he touches the positive conductor. Only when the man touches the positive lead and the negative conductor directly would he get a shock.

### ROD ELECTRICALLY HEATED

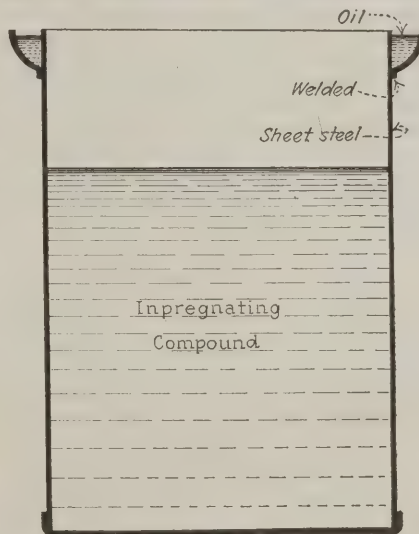
Whenever a piece of metal, usually a bolt or rod, is to be straightened the workman holds one end of it in his hand or in a pair of tongs and lays it upon the busbar in such a manner that

the end to be heated can be lowered into contact with the salt solution. As soon as the metal touches the salt water the current flows from the positive conductor into the solution, then through the rod up to the busbar and to ground. The end of the rod quickly heats and a few blows with a hammer straightens it. In this way parts needing repair which would ordinarily be thrown away are often made as good as new and frequently broken parts are heated so that they can be welded together after being heated and thus easily repaired.

## Oil-Sealed Tank Prevents Compound from Drying

One of the greatest difficulties in an electrical repair shop is to keep the impregnating compound from drying overnight or from day to day.

The Madison Coal Corporation, of Illinois, makes most of its electrical repairs at its Glen Carbon plant. "Last year the shop effected a saving of over \$5,000 in labor and material by making nearly all its own armature and field coils and repairing its electrical apparatus," says Joseph Long, assistant general superintendent of the company.



### Self-Sealing Tank

A reservoir extends completely around the outside of the tank containing the impregnating compound. By excluding the outside air only a little of the compound ever dries or thickens.

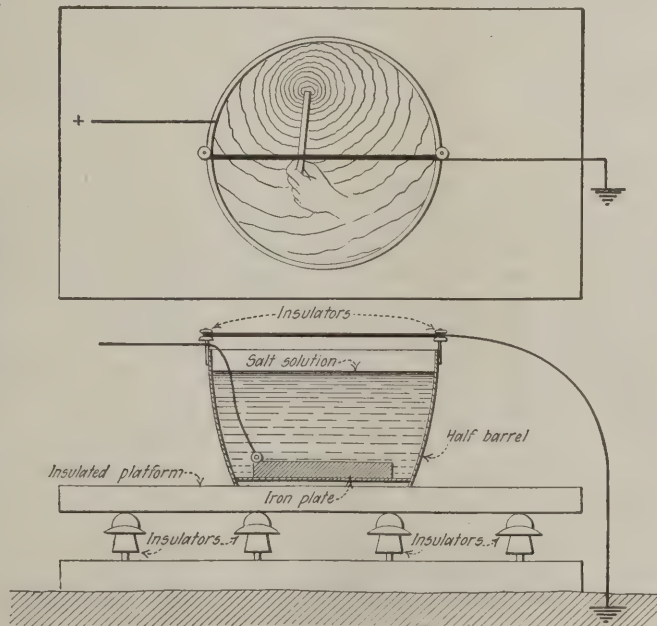
The shop is equipped with many modern coil-winding and electric repairing machines.

This company has designed an oil-sealed tank. When parts soaked with impregnating compounds are placed in this tank they are airtight and so protected from drying. This airtightness is obtained by welding a ring-shaped reservoir at the top of the tank and filling it with oil. When the cover is put in place the edge extends into the oil, and this traps the air in the tank and prevents its circulation and the entrance of other air.

The tank stands in a handy place in the shop where a large armature or a number of coils may be easily dipped and carried to a baking oven located in a small addition to the building.

### Electric Mine Forge

Machine parts which must be heated are placed in contact with the negative busbar on the barrel and the salt water solution. A forge like this never smokes or generates gas. It is used on a 250-volt trolley circuit.





## Discussion

### Ten per Cent of Rock Dust May Raise Ash Percentage to Required Figure

Dr. Wheeler Did Not Say That Ten per Cent of Inert Material Would Suffice—Size of Coal Dust More Potent Than Is Fuel Ratio

By GEORGE S. RICE

Chief Engineer, Bureau of Mines, Washington, D. C.

THE thoughtful letter of John Walls, of Ensley, Ala., relative to rock dusting and watering, in your issue of Aug. 7, appears to call for some reply from me, as he refers to certain statements I have made.

First, regarding the statement attributed to Dr. Wheeler that an addition of 10 per cent of rock dust is well worth seeking, I feel sure, from my conversations with Dr. Wheeler, that he had in mind not 10 per cent of rock dust added to pure coal dust but its addition to road dust already containing 30 to 40 per cent of inert material, in which is included both ash and moisture. He intended to convey to his hearers the idea that the addition of 10 per cent of artificially made rock dust would make it improbable that an ignition of the road dust would take place if a source of ignition was present.

#### INVOLUNTARY ROCK DUSTING

It is characteristic that the road dust in most British mines will run high in ash content, due to the general use of the longwall method of mining and the relatively friable roof material, which, by dribbling, often becomes mixed with the coal dust on the roadways.

Even in American mines, the experience of the Bureau of Mines, from taking thousands of road-dust, rib-dust and timber-dust samples, is that the ash plus moisture content in certain places, for example near partings, rarely is less than 25 or 30 per cent.

I hope that this will make it clear to the correspondent that there was no thought in the mind of Dr. Wheeler that 10 per cent of rock dust added to a pure coal dust which would give less than 20 per cent of inert matter in the mixture would be of the slightest avail in preventing ignition or propagation.

As concerns the second point, the effect of the ratio of volatile matter on the relative explosibility of a coal dust, the correspondent has a generally correct idea of this but he must take into account two factors profoundly modifying explosibility:

(a) Some coals, like the splint coals of West Virginia and the subbituminous coals of the West, break into naturally coarse, more or less cubical particles. Other coals, such as the Pittsburgh district and the Pocahontas field coals, break down into structureless particles. In the former, a person

can go into the mine and come out relatively clean, but in the second coal, with the same amount of exposure, he gets quite black. Henry Walker, Chief Inspector of Mines of Great Britain, remarked to me that when he got very black in inspecting a mine, he told the management to look out for dangerous dust conditions.

#### HAVE 40 PER CENT 200-MESH DUST

(b) As to the quantity of the finest dust present in the rock dust or rib dust, it is the percentage of dust passing through a 200-mesh, which the Bureau has found is the best index of the danger of a bituminous dust, and this in the average sample ranges from 10 in the less dangerous dust to rarely over 40 per cent for the more dangerous dust. When coal is pulverized, so that practically all of it passes through 200-mesh, it responds almost directly in sensitiveness to the volatile-total combustible ratio, but the influence of the two factors already described may be superior to a difference in percentage of volatile matter. The effect of the coarser particles in the average mine dust makes the British permitted limit of 50 per cent in any part of the roadways a safe limit, as it must never be forgotten that this refers to the extreme limit and when a sample shows more than 50 per cent combustible, that locality must be rock dusted afresh. Also, you may be sure that, with a 50-per cent limit, the average analysis of road dust in that mine will show at least 60 and probably 70 per cent of inert material.

As regards the use of water, it is admitted that there is a difference of opinion on the application of water. Dr. Wheeler has proposed the use of water in combination with rock dust, but his explanation of this is that there must then be enough water to render the mixture incapable of ignition. However, this does not represent the requirement of the British law. We of the Bureau of Mines believe that there are grave dangers in a combination process through which by wetting, or use of water in the roadways, the rock dust is caked so it will not be brought into suspension by a concussion and thus neutralize the coal dust; and also the making of fresh dust along the roadways, which in general is more rapid in American mines than in European mines, due to our high-speed haulage, may thus deposit this coal dust

on top of the caked dust in sufficient quantity to ignite or to propagate an explosion.

On the third question raised by Mr. Walls, concerning the recommendation which I made for watering at the face, more especially in connection with cutter-bar machines, my views on this point are that it will help to lay the dust, as it is formed, and when loaded wet on the cars it will not be blown off as dry coal dust is, increasing the percentage of combustible along the roadway. There is another great advantage in watering at the face, that the miners do not have to breathe so much dust. This makes for their comfort.

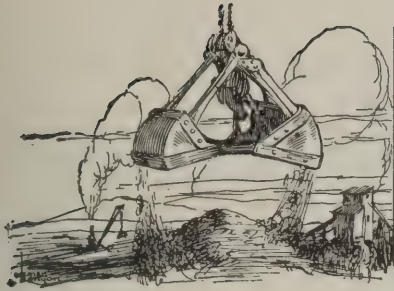
A fourth point not brought up by Mr. Walls, but in another paper in the same issue of *Coal Age* and referred to in the editorial, concerns the moisture in the air increasing the violence of a gas or gas and dust explosion. The original statement by Dr. H. B. Dixon has, I think, been much misunderstood. He referred to explosion tests in absolutely dry air in comparison with those in moist air. Practically, there is always enough moisture in air to obtain the necessary chemical reactions of gases when ignition takes place.

I trust the foregoing explanation will help clarify the views of Mr. Walls and those of others who have referred to apparent inconsistencies in recommendations of the British authorities and of the Bureau of Mines.

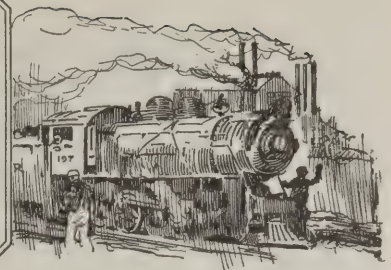
Mr. Rice seems to suggest that we have been ill advised in reprinting for public consumption a truth that Mr. Rice assures us is too often quoted in error. We have rarely heard it quoted at all either erratically or in any other way. We are in fact not concerned about our part in its dissemination even if it is misquoted. First, because it is the truth, and secondly because if it is misapplied it serves to mitigate the evil of another truth far more often misquoted and misunderstood namely that water is helpful in reducing the violence of explosions.

We have often heard it said that if the air contains water vapor to the saturation point it will prevent an explosion. We have seen that statement in the proceedings of our national mining society. Seeing that, it seems well to point out that methane does not combine with oxygen direct but through aqueous vapor and the more water vapor the more rapid the reaction. The real value of humidified air is that it leaves the natural water of the mine dusts undiminished and in condensing adds to that moisture. As the quantity has to be so great that the dust when compressed in the hand will drip water we feel that there is some real danger in declaring the efficacy of humidification, for when incompletely performed it is not efficacious even though helpful. So perhaps, Mr. Rice, it is well to write the whole truth in *Coal Age*, the manner in which water vapor aids an explosion, the value of humidification and the risk accompanying imperfect applications of water. This we have done; we hope helpfully. EDITOR.





# Production And the Market



## Increasing Inquiries Intensify Confidence in Soft-Coal Market; Prices Recede Slightly

Despite a slight recession in prices and the customary pre-holiday tendency to hold off during the past week, a distinct note of optimism continues to pervade the bituminous-coal market. Favorable crop reports, bespeaking prosperity for the farmer, have been followed by indications that other industries have turned the corner with the appearance of buying for the replenishment of depleted stocks, which would seem to show that the long-awaited autumn upturn is under way. Improvement is especially marked in the iron and steel trade, where a notable feature of the recent brisk demand is the heavy buying of railroads, which in the last two weeks have been in the market for about 400,000 tons of steel. Even the textile industry, which has been particularly hard hit by the prolonged depression, is showing encouraging signs of a revival in activity, the change for the better in that field being scarcely less notable than that in the iron and steel trade.

### Volume of Inquiries Growing

The general improvement in business is reflected in a steadily increasing volume of inquiries in the soft-coal market, and while actual orders have not soared to any great heights, the evidence of interest on the part of consumers has served to restore a much-needed note of confidence.

Coal Age Index of spot prices of bituminous coal receded slightly during the past week, standing on Aug. 30 at 164, the corresponding price being \$1.99, compared with 165 and \$2 for the previous week.

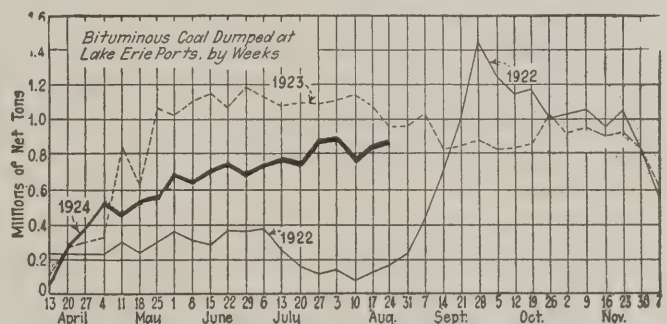
A pronounced increase in activity took place at Hampton Roads, dumpings of coal for all accounts during the week ended Aug. 28 totaling 364,227 net tons, compared with 315,540 tons during the preceding week.

The movement of coal up the lakes is still far behind that of last year, but with the carryover from a year

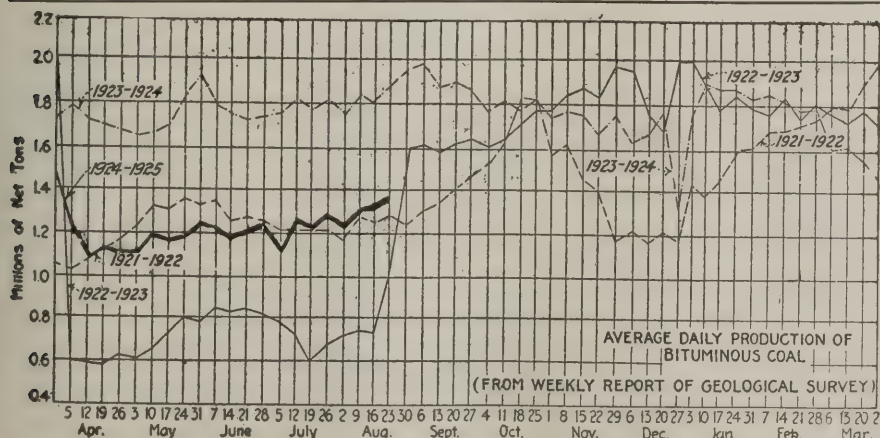
ago and lower consumption probably will prove ample for all requirements.

Production of bituminous coal registered a striking gain during the third week in August, crossing the 8,000,000-ton mark for the first time since last March. The total output during the week ended Aug. 23, according to the Geological Survey, was 8,293,000 net tons, an increase of 384,000 tons over the previous week, when 7,909,000 tons was produced, according to revised figures. Anthracite production also reacted upward, 1,711,000 net tons having been produced during the week ended Aug. 23, an increase of 325,000 tons over the preceding week, when the output was 1,386,000 net tons.

A better tone pervades the anthracite market, retailers ordering more freely last week in a last-minute



move to take advantage of summer prices. The larger companies advanced mine prices of the larger sizes on Sept. 1, the increase averaging 10c. per ton. Independent quotations, however, are practically unchanged but firm. Stove coal continues to show the greatest strength in demand, though egg and pea show improvement. Steam sizes likewise are moving somewhat better and prices show a firmer tendency.



### Estimates of Production

(Net Tons)

#### BITUMINOUS

	1923	1924
Aug. 9.....	9,851,000	7,789,000
Aug. 16 (a).....	10,843,000	7,909,000
Aug. 23 (b).....	11,383,000	8,293,000
Daily average.....	1,897,000	1,382,000
Cal. yr. to date (c).....	354,612,000	285,875,000
Daily av. to date.....	1,780,000	1,430,000

#### ANTHRACITE

Aug. 9.....	1,735,000	1,664,000
Aug. 16.....	1,858,000	1,386,000
Aug. 23.....	2,165,000	1,711,000
Cal. yr. to date.....	66,592,000	58,950,000

#### COKE

Aug. 16 (a).....	334,000	95,000
Aug. 23 (b).....	327,000	109,000
Cal. yr. to date (c).....	12,800,000	6,872,000

(a) Revised since last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.



## Midwest Trade Grows

The Midwest coal trade feels distinctly better. There is nothing in the nature of a rush going on but domestic coals are shaking off their sluggishness and slight advances in some coals were attempted for Sept. 1. Franklin County 6-in. lump advanced from \$3 to \$3.25, egg from \$2.75 to \$3 and nut from \$2.35 to \$2.50. Screenings move in small quantities and remain at about the same price range they have occupied for weeks—\$1.60@1.75. No other price changes in Western coals were anticipated for Sept. 1. West Kentucky block held at \$2.40@2.60; 6x3-in. egg and 3-in. lump, \$2.25@2.40; No. 2 nut, \$1.75@1.90, and screenings, \$1.25@1.35. Indiana coals also were unchanged. No. 4 lump moves at \$3 and the other sizes trail Franklin County by 15 or 25c. No. 5 sizes maintain about their usual 25c. differential under No. 4.

In Chicago the retail trade in anthracite is picking up a little in anthracite as well as in high-grade bituminous. Hard-coal prices made their monthly wholesale advance of about 10c. which had its reflection in retail quotations. West Virginia smokeless continued its slow and steady movement into the Chicago district, with mine run maintaining its \$2 top price. So much of this coal has been

coming in all summer, however, that the domestic trade is not crying for it now.

In the Carterville field of Williamson and Franklin counties there is a noticeable movement of lump in the last week for domestic business, principally in the Northwest. Egg is just beginning to move a little, but nut and the other sizes are heavy and steam is going to be a problem in a short time when the mines show steadier work. Mines still get from 1 to 3 days a week in places and the miners are about at the limit of their resources.

Railroad tonnage is light. Strip mines show increased tonnages. All mines have "no bills" of all kinds, excepting lump, on track. The off-grade coals around Marion are having a hard time and are being marketed through a group of scalpers in Chicago.

In the East Jackson and Duquoin field conditions are bad with no immediate prospect of improvement. In the Mt. Olive district the railroad tonnage is about the only thing that keeps the mines in operation. Mines are getting 2 days a week, at most. In the Standard district conditions are unusually bad. Coal is still selling below cost and all sizes remain on track unbilled.

There is now a little activity in St. Louis in Southern Illinois high-grade coals. Other than that the movement is

## Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern		Market Quoted	Sept. 1 1923	Aug. 18 1924	Aug. 25 1924	Aug. 30 1924†
Smokeless lump.....	Columbus.....	\$5.95	\$3.60	\$3.60	\$3.50@3.75	
Smokeless mine run.....	Columbus.....	3.00	2.00	2.00	1.85@2.15	
Smokeless screenings.....	Columbus.....	2.35	1.20	1.25	1.15@1.30	
Smokeless lump.....	Chicago.....	6.35	3.85	3.60	3.50@3.75	
Smokeless mine run.....	Chicago.....	3.35	1.85	1.85	1.75@2.00	
Smokeless lump.....	Cincinnati.....	6.25	3.85	3.75	3.50@4.00	
Smokeless mine run.....	Cincinnati.....	3.25	1.85	1.85	1.75@2.00	
Smokeless screenings.....	Cincinnati.....	2.50	1.35	1.30	1.25@1.50	
*Smokeless mine run.....	Boston.....	5.10	4.15	4.15	4.10@4.20	
Clearfield mine run.....	Boston.....	2.20	1.85	1.85	1.45@2.35	
Cambria mine run.....	Boston.....	2.85	2.45	2.45	2.00@2.60	
Bomerset mine run.....	Boston.....	2.50	2.10	2.10	1.75@2.40	
Pool I (Navy Standard).....	New York.....	3.25	2.30	2.85	2.60@2.50	
Pool I (Navy Standard).....	Philadelphia.....	3.10	2.80	2.40	2.35@2.50	
Pool I (Navy Standard).....	Baltimore.....				2.40@2.90	
Pool 9 (Super. Low Vol.).....	New York.....	2.55	2.05	2.10	2.00@2.30	
Pool 9 (Super. Low Vol.).....	Philadelphia.....	2.55	2.15	2.15	1.95@2.35	
Pool 9 (Super. Low Vol.).....	Baltimore.....	2.45	1.95	1.95	1.80@2.10	
Pool 10 (H.Gr. Low Vol.).....	New York.....	2.25	1.85	1.85	1.30@2.00	
Pool 10 (H.Gr. Low Vol.).....	Philadelphia.....	2.15	1.75	1.75	1.65@1.90	
Pool 10 (H.Gr. Low Vol.).....	Baltimore.....	2.25	1.70	1.70	1.60@1.65	
Pool 11 (Low Vol.).....	New York.....	2.00	1.60	1.60	1.50@1.80	
Pool 11 (Low Vol.).....	Philadelphia.....	1.85	1.45	1.45	1.35@1.60	
Pool 11 (Low Vol.).....	Baltimore.....	1.90	1.55	1.55	1.40@1.50	
High-Volatile, Eastern						
Pool 54-64 (Gas and St.).....	New York.....	1.70	1.50	1.50	1.35@1.65	
Pool 54-64 (Gas and St.).....	Philadelphia.....	1.85	1.50	1.50	1.40@1.60	
Pool 54-64 (Gas and St.).....	Baltimore.....	1.85	1.45	1.45	1.35@1.40	
Pittsburgh acid gas.....	Pittsburgh.....	3.00	2.40	2.40	2.30@2.50	
Pittsburgh gas mine run.....	Pittsburgh.....	2.50	2.10	2.10	2.00@2.25	
Pittsburgh slack (Gas).....	Pittsburgh.....	2.30	1.85	1.85	1.75@2.00	
Kanawha lump.....	Pittsburgh.....	1.55	1.30	1.30	1.25@1.35	
Kanawha mine run.....	Columbus.....	3.05	2.10	2.10	2.00@2.25	
Kanawha screenings.....	Columbus.....	1.15	1.40	1.40	1.30@1.55	
W. Va. lump.....	Cincinnati.....	1.90	1.05	1.05	1.00@1.15	
W. Va. gas mine run.....	Cincinnati.....	3.60	2.25	2.05	1.85@2.25	
W. Va. steam mine run.....	Cincinnati.....	1.80	1.55	1.50	1.45@1.50	
W. Va. screenings.....	Cincinnati.....	1.80	1.40	1.50	1.25@1.50	
Hocking lump.....	Cincinnati.....	1.35	.90	.80	.80@1.00	
Hocking mine run.....	Columbus.....	2.75	2.45	2.40	2.25@2.55	
Hocking screenings.....	Columbus.....	1.85	1.55	1.55	1.45@1.65	
Pitts. No. 8 lump.....	Cleveland.....	1.10	1.05	1.05	1.00@1.10	
Pitts. No. 8 mine run.....	Cleveland.....	2.65	2.40	2.40	2.00@2.85	
Pitts. No. 8 screenings.....	Cleveland.....	2.10	1.65	1.80	1.75@1.85	
		1.35	1.30	1.20	1.05@1.20	
Midwest		Market Quoted	Sept. 1 1923	Aug. 18 1924	Aug. 25 1924	Aug. 30 1924†
Franklin, Ill. lump.....	Chicago.....	\$4.20	\$2.85	\$2.85	\$3.00@3.25	
Franklin, Ill. mine run.....	Chicago.....	3.00	2.35	2.35	2.25@2.50	
Franklin, Ill. screenings.....	Chicago.....	1.80	1.85	1.85	1.60@1.15	
Central, Ill. lump.....	Chicago.....	3.10	2.60	2.60	2.50@2.75	
Central, Ill. mine run.....	Chicago.....	2.20	2.10	2.20	2.15@2.25	
Central, Ill. screenings.....	Chicago.....	1.40	1.60	1.55	1.35@1.75	
Ind. 4th Vein lump.....	Chicago.....	3.35	2.75	2.85	2.75@3.00	
Ind. 4th Vein mine run.....	Chicago.....	2.60	2.35	2.35	2.25@2.50	
Ind. 4th Vein screenings.....	Chicago.....	1.60	1.80	1.80	1.60@1.70	
Ind. 5th Vein lump.....	Chicago.....	2.75	2.50	2.50	2.40@2.65	
Ind. 5th Vein mine run.....	Chicago.....	2.10	2.10	2.10	2.00@2.25	
Ind. 5th Vein screenings.....	Chicago.....	1.40	1.50	1.50	1.40@1.65	
Mt. Olive lump.....	St. Louis.....	3.10	2.85	2.85	2.75@3.00	
Mt. Olive mine run.....	St. Louis.....	2.05	2.50	2.50	2.50	
Mt. Olive screenings.....	St. Louis.....	1.35	2.00	2.00	1.75	
Standard lump.....	St. Louis.....	2.60	2.15	2.15	2.00@2.35	
Standard mine run.....	St. Louis.....	2.05	1.80	1.80	1.75@1.85	
Standard screenings.....	St. Louis.....	1.00	1.20	1.20	1.15@1.25	
West Ky. lump.....	Louisville.....	2.55	2.20	2.25	2.15@2.35	
West Ky. mine run.....	Louisville.....	1.90	1.60	1.60	1.40@1.85	
West Ky. screenings.....	Louisville.....	.90	1.20	1.30	1.25@1.35	
West Ky. lump.....	Chicago.....	2.75	2.30	2.30	2.25@2.40	
West Ky. mine run.....	Chicago.....	1.75	1.55	1.60	1.35@1.90	
South and Southwest						
Big Seam lump.....	Birmingham.....	3.75	3.40	3.40	\$3.00@3.30	
Big Seam mine run.....	Birmingham.....	1.95	1.75	1.75	1.50@2.00	
Big Seam (washed).....	Birmingham.....	2.35	2.00	2.00	1.75@2.25	
S. E. Ky. lump.....	Chicago.....	3.10	2.50	2.60	2.15@2.60	
S. E. Ky. mine run.....	Chicago.....	1.80	1.60	1.75	1.50@1.75	
S. E. Ky. lump.....	Louisville.....	3.10	2.10	2.10	2.00@2.50	
S. E. Ky. mine run.....	Louisville.....	2.00	1.50	1.50	1.25@1.75	
S. E. Ky. screenings.....	Louisville.....	1.20	.95	.95	.85@1.10	
S. E. Ky. lump.....	Cincinnati.....	3.75	2.35	2.50	2.25@2.75	
S. E. Ky. mine run.....	Cincinnati.....	1.80	1.55	1.50	1.25@1.65	
S. E. Ky. screenings.....	Cincinnati.....	1.45	1.00	1.00	.80@1.10	
Kansas lump.....	Kansas City.....	4.50	4.50	4.50	4.50	
Kansas mine run.....	Kansas City.....	3.50	3.50	3.50	3.50	
Kansas screenings.....	Kansas City.....	2.60	2.50	2.50	2.50	

\* Gross tons, f.o.b. vessel, Hampton Roads.

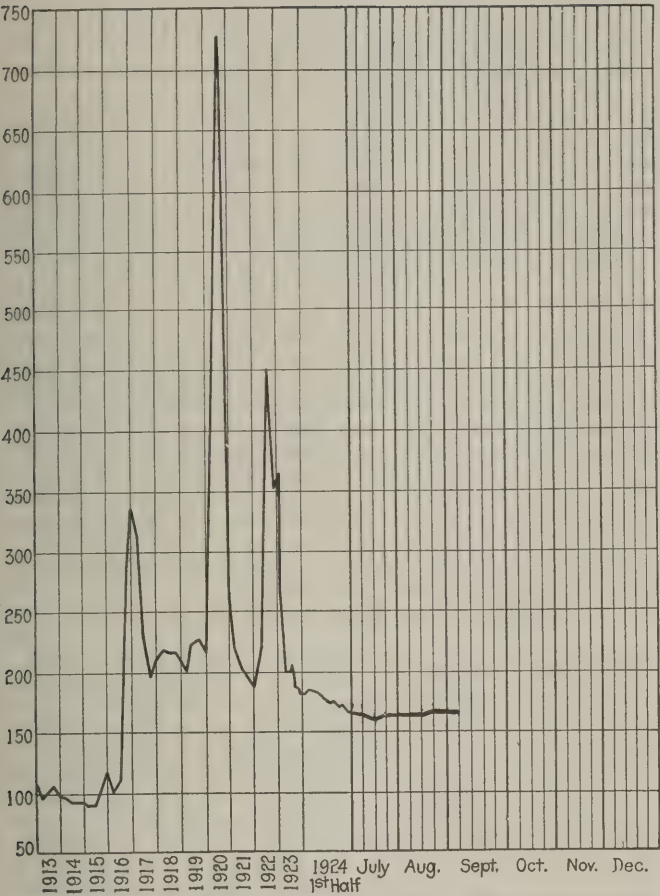
† Advances over previous week shown in heavy type, declines in italics.

## Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

		Market Quoted	Freight Rates	Sept. 1, 1923		Aug. 25, 1924		Aug. 30, 1924†	
				Independent	Company	Independent	Company	Independent	Company
Broken.....	New York.....	\$2.34			\$7.75@8.35		\$8.00@9.05		\$8.00@9.25
Broken.....	Philadelphia.....	2.39			7.90@8.10		8.90@9.05		8.90@9.05
Egg.....	New York.....	2.34		\$8.50@14.00	8.00@8.35	\$8.50@9.00	8.65@9.05	\$8.50@9.00	8.75@9.25
Egg.....	Philadelphia.....	2.39		9.25@11.00	8.10@8.35	9.00@9.70	9.00@9.05	9.00@9.70	9.00@9.05
Egg.....	Chicago*.....	5.06		8.50@12.00	7.25@7.45	8.09@8.20	8.03@8.10	8.17@8.27	8.14@8.20
Stove.....	New York.....	2.34		8.50@14.50	8.00@8.35	9.00@9.50	8.65@9.30	9.00@9.50	8.75@9.50
Stove.....	Philadelphia.....	2.39		9.25@12.00	8.15@8.35	9.35@10.00	9.05@9.10	9.35@10.00	9.05@9.10
Stove.....	Chicago*.....	5.06		8.50@12.00	7.25@7.45	8.40@8.50	8.43@8.53	8.63@8.75	8.50@8.64
Chestnut.....	New York.....	2.34		8.50@14.00	8.00@8.35	8.50@9.00	8.65@9.15	8.50@9.00	8.75@9.25
Chestnut.....	Philadelphia.....	2.39		9.25@11.00	8.15@8.35	8.85@9.80	9.00@9.05	8.85@9.80	9.00@9.05
Chestnut.....	Chicago*.....	5.06		8.50@12.00	7.25@7.45	8.18@8.33	8.28@8.34	8.26@8.40	8.44@8.60
Range.....	New York.....	2.34			8.30		8.90		8.90
Pea.....	New York.....	2.22		7.50@9.00	6.00@6.30	4.25@5.25	5.50@6.00	4.25@5.25	5.50@6.00
Pea.....	Philadelphia.....	2.14		7.00@7.50	6.15@6.20	5.75@6.25	5.75@6.00	5.75@6.25	5.75@6.00
Pea.....	Chicago*.....	4.79		7.00@8.50	5.30@5.65	5.23@5.55	5.36@5.91	5.13@5.45	5.36@6.20
Buckwheat No. 1.....	New York.....	2.22		3.50	3.50@4.15	2.00@2.25	3.00@3.15	2.25@2.65	3.00@3.15
Buckwheat No. 1.....	Philadelphia.....	2.14		3.50	3.50	2.50@3.00	3.00	2.50@3.00	3.00
Rice.....	New York.....	2.22		2.50	2.50	1.75@2.00	2.00@2.25	1.75@2.00	2.00@2.25
Rice.....	Philadelphia.....	2.14		2.50	2.50	2.00@2.25	2.25	2.00@2.25	2.25
Barley.....	New York.....	2.22		1.50	1.50	1.15@1.40	1.50	1.15@1.50	1.50
Barley.....	Philadelphia.....	2.14		1.50	1.50	1.50	1.50	1.50	1.50
Birdseye.....	New York.....	2.22			1.60		1.60		1.60

\* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.





Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

	1924			1921
	Aug. 30	Aug. 25	Aug. 18	Sept. 1
Index	164	165	165	204
Weighted average price	\$1.99	\$2.00	\$2.00	\$2.47

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board.

light, although there are indications here and there of increased buying which will mature early this month. Anthracite, smokeless and coke are slow.

**Kentucky Prices Advance**

It is reported that the operators down in the Harlan, Straight Creek and Jellico producing districts have booked a considerable number of orders of late, principally on movement to the South and Southeast, resulting in their having enough business in hand to be able to refuse orders unless prices are satisfactory, with the result that they are now pricing block coal for late September delivery at from \$2.75@ \$3 a ton, but still taking some immediate business at around \$2.50. Lump coal also has advanced a little in that section and is being priced as high as \$2.50, with egg as high as \$2.25.

There has been considerable improvement in general demand in the Southeastern field. However, it is claimed that the Southern demand will be filled soon and that prices probably will not go much over a peak of \$2.75 for the time being.

**Northwest Anthracite More Active**

Coal is generally dull at Duluth this week in bituminous, but anthracite has taken a decided spurt and out of town orders especially are good from the Dakotas and from Winnipeg. In fact the situation in Winnipeg seems to be bordering on the serious. Dealers there are worrying a little about prospective difficulties in getting enough coal. Shipments to this port have been steadily dropping off for the past three weeks, and this week only 37 cargoes arrived, of which six were hard coal. Fourteen are reported on the way, of which six are hard. So far this year, since

the opening of navigation, 510 cargoes have been landed, of which 414 were soft coal. This is below average, but the stocks on docks at the beginning of the period make up for the lack of shipments.

Soft-coal prices are the same. Hard coal is weakening a little, and the 10c. advance scheduled for the first of the month will apply only to stove, egg and nut. Prices are as follows at present with pea and buckwheat off: Stove, \$13.50; egg, \$13.10; nut, \$13.35; pea, \$10.60; buckwheat, \$8.

At the Twin Cities there is a noticeable shortage of steam sizes, but buyers with a little coal on hand are holding off. This moves the trade to hope that when cold weather arrives and coal demand picks up, there may be real strength in the Minneapolis steam market. The retail trade around southern Minnesota is now putting in hard coal. The volume on the docks is expected to be smaller this year than normal but movement inland can be swift during the next few weeks, due to heavy traffic in empties on their way back from delivering grain eastward. The 10c. increase Sept. 1 put hard-coal prices on a winter basis. There are no changes in soft-coal prices in spite of the lack of demand for those grades.

**West Improves Steadily**

Continued though slight improvement in the Southwestern market is reported, and operators are expecting an early opening of the heavy autumn demand. Farm prosperity is expected to be reflected in increased orders for domestic grades. No changes have been made in prices in the Kansas City district.

A marked stimulation was noted last week both in the sales and production of domestic coal in Colorado. Orders are beginning to come in more steadily now and operators are anticipating a busy month for September. The average working time of the mines picked up to twenty-one hours last week. Prices were unchanged to Sept. 1 although a slight advance was expected then.

In Utah intermediate sizes are a drug on the market, in spite of recent price adjustments. The sales office of one big firm reports business generally a little slower than a year ago. The demand for coal from the coast is very light now that the storage orders have been filled, while the Northwest business has not started yet, it is stated. Mining, smelting, cement and sugar industries are buying some coal. The sugar factories will start operations the first week in October. Retail business is in good shape.

**Better Domestic Market at Cincinnati**

Betterment of the domestic market with wider breadth of inquiry is the only bright spot in the sluggish situation at Cincinnati. Selling agents for coals of quality profess to have experienced little difficulty in getting the advance placed on prepared sizes. Lake buyers are beginning to evince interest in the market and some attractive buying orders for run of mine and 2-in. sizes have been placed lately. Low grades are hard to move, being the only lines on which forced concessions are being made. Smokeless prices for September are practically the same as for August, standard Pocahontas being held at \$4 by companies with bookings for the month, others taking only contract business at \$3.75. Some New River spot can still be picked up at \$3.50. The market on screenings still drags.

The domestic trade continues to be the best feature of the Columbus market, but even that lacks real vim. Buying by dealers is better but not equal to previous years. Smokeless and splints are moving best, although there is a fair business in Hocking, Jackson and Pomeroy lump. Dullness characterizes the steam trade. Buying is limited to present needs and many of the larger consumers are still using reserves, which in some instances are still heavy. Bargain buying is the rule, although there is not as much demurrage coal on the market as formerly. Utilities, railroads, schools and public institutions are taking a fair tonnage.

The Cleveland market shows better tone, due to the usual seasonal pick-up and improved business conditions. Output in eastern Ohio during the week ended Aug. 23, 296,000 tons, was the largest of any week since that of March 22, the gain over the preceding week being 49,000 tons. Spot prices remain pretty much the same except that slack has receded further to \$1.05@ \$1.10 for slack and \$1.10@ \$1.20 for nut and slack. The railroads in report increases in general traffic handled during the past few weeks.



### Further Gain at Pittsburgh

General line trade at Pittsburgh worked up a trifle farther in the past week. Little change has been observable from week to week, but there has been a decided gain in the aggregate in the past two months. There has been little increase in the volume of coal moving through the spot market, but there is a little more activity. Buying of domestic coal by retailers has been picking up, though it is not yet really active by ordinary comparisons. Prices are a little steadier.

The demand at Buffalo continues light, though some in the trade profess to see the fall trade coming into sight. The decision of the City School Board to use soft coal instead of hard for a great part of its fires will set many private users to asking for the same thing, as it means an expense of less than \$6 a ton in place of \$13 for anthracite. The coke trade is still inactive.

The Toronto market shows practically no change, as industrial requirements are still quite limited. A gradual improvement, however, is regarded as probable in view of favorable reports of the Western harvest, which will stimulate all lines of business. Quotations f.o.b. cars at destination are as follows: Steam lump, \$6@6.40; Pennsylvania smokeless, \$5.30@6.25; slack, about \$5.

### Inquiry More Active in New England

High-grade New River and Pocahontas has reacted from a low of \$5.25 per gross ton on cars Boston to \$5.35. Receipts at Mystic Wharf have been much lighter the past week and inquiry has been a bit more active, in some instances involving shipments through the balance of the year, some at \$5.75 gross ton on cars Boston for strictly pool 1 mine-run coal.

Due to rather heavy arrivals prices declined early in the week at Providence and as low as \$5.30 on cars was taken for what was claimed to be pool 1 coal. The situation has firmed somewhat since, so that \$5.40 is now the general asking price.

Quotations to local shippers for spot coal at the southern loading ports indicate complete maintenance of last week's levels, \$4.10 gross ton f.o.b. Hampton Roads being the lowest at which strictly pool 1 mine-run coal is offered.

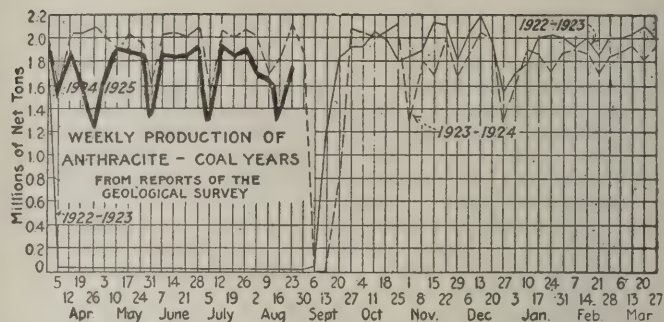
There is actually no all-rail market in New England now. Consequently prices are entirely nominal, although save for some tonnage from non-union mines on the B. & O. which is offered at lower prices—\$1.75 to \$2 for really good coal—prices seem to be just about as they have been for weeks.

### Atlantic Markets Dull but Hopeful

Actual buying during the week at New York showed no real betterment, but there were more inquiries and taken as a whole the outlook is brighter. Favorable reports have been received as to business conditions in various parts of the East and sellers are optimistic that new orders will soon show themselves. The fact that the grain movement is expected to be in full swing soon has aroused some large consumers to the thought that they had better get busy and make arrangements for replenishing their reserve stocks, which are fast nearing depletion.

Orders have failed to flow readily as yet at Philadelphia, though more small orders are coming along. Railroads are taking a little extra tonnage, but the best customers are cement and brick plants.

The coal business at Baltimore is at the lowest ebb of many months as to prices. There is hardly a gas or steam



coal on the local market that is not selling at a mine-basis price below the actual cost of production. Not much coal is moving, however, at any price. The export situation has gone flat along with the balance of the trade. Only two shipments have been made on foreign account since Aug. 11.

Buying at Birmingham continues in restricted volume, but some increase in inquiry and business booked is reported and the trade is more hopeful. Orders are confirmed for the most part to small tonnages, but are larger in the aggregate with some contracts being made. Some improvement in the export and bunker movement is looked for, the demand being rather quiet at present.

### Anthracite Reflects Better Feeling

A better feeling pervades the hard-coal market at New York. Dealers, apparently desirous of taking advantage of the August prices for domestic sizes, ordered a little more freely last week. The greatest strength is in the demand of stove coal, which has moved easily all summer, but chestnut improved greatly. Egg and pea coals also were in better demand. Average independent quotations were firmer and with the supply tighter, due to the better demand and continued low production, tended to still higher levels. Buckwheat No. 1 is in better demand and the better grades are a trifle stronger in price. Rice and barley are moving better.

The Philadelphia market has not lost ground, although some are apprehensive that the recent stir was only a flash. The larger companies still continue to work a short week, but better working time is general among the independents. Stove is the most wanted size, and dealers are able to get it without much trouble. It is taken for granted that all shippers will increase mine prices as of Sept. 1. Steam sizes have brightened up a bit, with the exception of rice, which is still weak.

A seasonal increase is developing at Baltimore. Consumers apparently have been taking advantage of the last chance for summer rates, but a large number are not laying in the usual full winter supply. Wholesalers' price advances will force up retail prices at least 25c. per ton during September.

Trade at Buffalo is doing a little better and in a week or two ought to be up to something like normal proportions. People have been slow to buy. They have heard so much of the effort to get coal at lower prices that it has been hard to interest them.

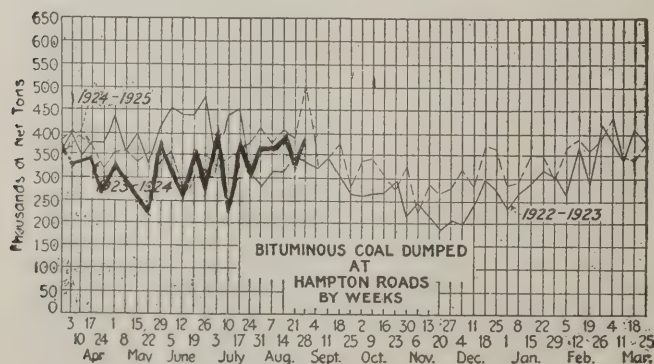
Connellsville coke operators have advanced the price 25c. on fourth-quarter furnace coke contracts, two contracts at least being closed at \$3.25. A few operators are holding off in hope of securing somewhat more than \$3.25. By the reduction of last June most of the operators are paying the Nov. 10, 1917, scale, about one-third below the Frick scale of Aug. 23, 1922, which the Steel Corporation continues to pay. The spot furnace-coke market has advanced 10c. to \$3.10. Heating or medium sulphur coke has stiffened sharply and is now quotable rather steady at \$2.90@3. Foundry coke has been particularly dull in the past fortnight, but prices are unaltered, the market being quotable at \$4@4.50.

### Car Loadings, Surpluses and Shortages

	Cars Loaded	
	All Cars	Coal Cars
Week ended Aug. 16, 1924.....	952,888	144,549
Previous week.....	942,198	149,482
Week ended Aug. 18, 1923.....	1,039,930	189,179

	Surplus Cars		Car Shortage	
	All Cars	Coal Cars		
Aug. 15, 1924.....	278,476	127,801		
Previous week.....	296,496	138,325		
Aug. 14, 1923.....	78,404	6,293	8,315	4,193





Foreign Market  
And Export News

British Coal Market Steady but Slow;  
Output Advances Sharply

The Welsh coal market is steady and has maintained its recent improvement, though the general situation is far from satisfactory. Some of the best coals are fairly well booked for prompt loading. Most of the Welsh operators are losing money at the current prices, though experience varies from colliery to colliery; some of the more modern pits are showing a profit, but the older concerns are undoubtedly losing heavily. Despite the fact that few collieries are able to cover operating expenses, they are reluctant to make concessions.

The men everywhere are anxious to keep the pits going, offering in some instances to work on a piece-work basis to prevent shutdown. In one case a mine employing 1,700 men has been restarted on these terms. The August wages of the miners have remained at the minimum of 42.22 per cent above the 1915 standard, of which the owners have to make up 18.17 per cent.

The Newcastle market has remained fairly steady since its improvement a week ago, and best steams and best gas coals have been able to find quite a ready market, though business in the other sections is slow. There are various contracts to be filled, of around 10,000-12,000 tons of gas coals for various European plants.

Production recovered sharply following the bank holidays, a cable to *Coal Age* states, output of the British collieries during the week ended Aug. 16 totaling 5,193,000 tons, according to the official reports. This compares with 3,446,000 tons during the week ended Aug. 9 and 5,010,000 tons during that ended Aug. 2.

The output during the second quarter of 1924 was 5,367,800 tons less than during the first quarter and 2,901,900 below the second quarter of 1923. There were 4,600 more wage earners during the second quarter than in the preceding one and 33,800 more than a year ago. The number of working days

was 8½ per cent below the first quarter and 6 per cent below the corresponding quarter last year. Exports during the second quarter were 280,843 tons less than during the first three months and 5,689,372 tons under those during the second quarter of 1923. Price reductions have been made since March of 4s. on foreign shipments and locomotive coal, and 3s. on household grades.

Hampton Roads Market Dull  
And Unpromising

Business at Hampton Roads is featureless, little activity being in evidence. Prices have fallen to a low ebb, threatening to break the low record since the war. Coastwise trade is dull, foreign trade almost invisible, and bunker business only fair.

Some increase in domestic trade is apparent, retailers placing orders for September shipment, somewhat strengthening the domestic price of smokeless coal. This business, however, has made no impression on the port trade. The supplies at tidewater are fair, shippers making every effort to keep things moving to avoid demurrage. The tone of the market is weak and little hope of early improvement is felt.

French Household Coal Steady;  
Industrial Inquiry Slow

The French coal market continues without important change. House coals remain steady, dry and half-bituminous fuels being in good request and disposals insufficient to meet the demand. For industrial coals, although the collieries are assured of a certain regularity in marketing by contracts, the inquiry is somewhat slower, due to the pessimism following recent political developments. The placing of dry smalls is rather difficult.

On the German side, liberal offers continue, outside of indemnity deliv-

eries, and this may be the prelude to further competition.

The freight rate is 20 fr. Bethune-Paris and Bethune-Reims.

Indemnity deliveries to France and Luxemburg for the first thirteen days of the month were 179,800 tons of coal, 173,200 tons of coke and 8,000 tons of lignite briquets, or 361,000 tons in all.

Supplies of coke to the O. R. C. A. for the first eighteen days of August were 165,207 tons, or a daily average of about 9,235 tons.

There is an accumulation of stocks at the Belgian mines and everywhere the situation is critical, especially in the district of Borinage, where the collieries meet keen competition in bituminous coals from British, French and even German mines.

Germany delivered 2,000,000 tons of coal to Italy on reparation account during the first six months of this year, according to official statistics at Rome.

Export Clearances, Week Ended  
Aug. 30, 1924

FROM PHILADELPHIA		
For Cuba:		Tons
Br. Str. Sunpath, for Havana.....	—	—
For Newfoundland:		
Nor. Str. Recto, for St. John's.....	—	—
FROM BALTIMORE		
For Porto Rico:		
Am. Str. Delfina, for San Juan ....	3,438	
FROM HAMPTON ROADS		
For Newfoundland:		Tons
Nor. Str. Osterdal, for Lewisporte....	5,619	
For Spain:		
Br. Str. Lancastrian, for Barcelona..	3,300	
For Newfoundland:		
Amer. Schr. Katherine May, for St. Johns .....	1,267	
For Brazil:		
Br. Str. Cheniston, for Rio de Janeiro.	6,475	

Hampton Roads Pier Situation

	Aug. 21	Aug. 28
N. & W. Piers, Lamberts Pt.:		
Cars on hand.....	1,051	1,082
Tons on hand.....	65,827	67,931
Tons dumped for week.....	157,234	124,903
Tonnage waiting.....	10,700	10,000
Virginian Piers, Sewalls Pt.:		
Cars on hand.....	1,797	1,372
Tons on hand.....	127,000	100,100
Tons dumped for week.....	53,826	110,879
Tonnage waiting.....	10,163	7,300
C. & O. Piers, Newport News:		
Cars on hand.....	1,458	1,521
Tons on hand.....	79,010	80,875
Tons dumped for week.....	70,670	89,221
Tonnage waiting.....	3,285	225

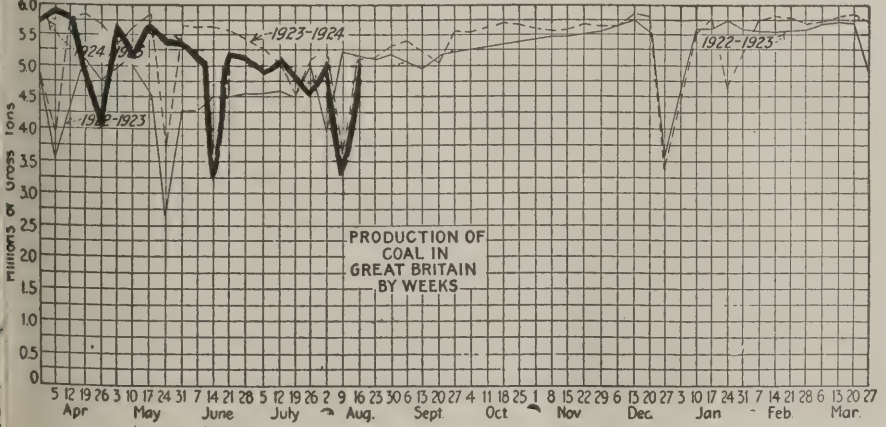
Pier and Bunker Prices, Gross Tons

PIERS		Aug. 23	Aug. 30†
Pool 9, New York.....	\$4.50@	\$4.85	\$4.50@ \$4.85
Pool 10, New York.....	4.35@	4.65	4.35@ 4.65
Pool 11, New York.....	4.00@	4.35	4.00@ 4.35
Pool 9, Philadelphia....	4.90@	5.25	4.90@ 5.25
Pool 10, Philadelphia....	4.45@	4.70	4.45@ 4.70
Pool 11, Philadelphia....	4.30@	4.50	4.30@ 4.50
Pool 1, Hamp. Roads....	4.10@	4.20	4.05
Pool 2, Hamp. Roads....	4.00@	4.10	3.95
Pools 5-6-7 Hamp. Rds.	3.90@	4.00	3.85@ 4.00
BUNKERS		Aug. 23	Aug. 30†
Pool 9, New York.....	4.75@	5.10	4.75@ 5.10
Pool 10, New York.....	4.60@	4.90	4.60@ 4.90
Pool 11, New York.....	4.25@	4.60	4.25@ 4.60
Pool 9, Philadelphia....	4.90@	5.25	4.90@ 5.25
Pool 10, Philadelphia....	4.75@	4.95	4.75@ 4.95
Pool 11, Philadelphia....	4.50@	4.70	4.50@ 4.70
Pool 1, Hamp. Roads....	4.10@	4.20	4.15
Pool 2, Hamp. Roads....	4.00@	4.10	4.05
Pools 5-6-7 Hamp. Rds.	3.90@	4.00	3.85@ 4.00

Current Quotations British Coal f.o.b.  
Port, Gross Tons

Quotations by Cable to Coal Age		
Cardiff:	Aug. 23	Aug. 30†
Admiralty, large.....	29s.	29s.6d. @ 29s.
Steam smalls.....	17s. @ 17s.6d.	17s.
Newcastle:		
Best steams.....	20s.9d. @ 21s.	20s.9d. @ 24s.
Best gas.....	22s. @ 22s.6d.	22s.6d. @ 23s.
Best bunkers.....	19s.6d.	20s.

†Advances over previous week shown in heavy type, declines in italics.







## News Items From Field and Trade



### ALABAMA

A large tract of land lying between the furnace and coking plants of the Woodward Iron Co. and the pipe plant, at Bessemer, has been acquired by the Woodward company. It is understood that the property was purchased as a protection against encroachment, the rumor of the contemplated erection of a steel plant being denied by the officials.

Alabama produced a total of 4,689,641 net tons of coke during the calendar year 1923, according to the official report of State Mine Inspector C. H. Nesbitt, of which 4,448,128 tons, or 94.8 per cent, was made in byproduct ovens, and 241,513 tons, or only 5.2 per cent, was produced in the old beehive ovens. Byproduct ovens in operation during 1923 numbered 1,196.

The Alabama By-Products Corporation will begin immediately the construction of twenty-five additional ovens at its Boyles plant, according to official announcement. The corporation now has seventy-five Koppers ovens in operation and the necessary plant equipment to take care of the coke byproducts, and the additional ovens will provide for coking something like 40,500 tons per month, the plant addition to cost around \$1,000,000. While most of the coal coked at the plant at present comes from the Majestic and Imperial mines of the Bush interests in upper Jefferson County, some coal is coked for outside parties. Byproduct gas is furnished to a number of industrial plants in the district. The new unit probably will be of the Koppers type, it is stated.

### COLORADO

A total of 616,186 tons of coal was mined in Colorado during July, bringing the production for the state this year to 5,581,066 tons, according to James Dalrymple, state coal mine inspector. The average number of men employed in and about the mines since the first of the year is 12,317 and the average number of days worked in each mine, 99.2. Las Animas County led in the production of coal for July, Mr. Dalrymple said. In this county 272,510 tons were mined last month, making the total there for the year 1,902,739 tons of coal.

The state law governing the operation of coal mines was not complied with in the Alamo mine of the Alamo Coal Co., near Walsenburg, according to a report submitted to Governor Sweet by James Dalrymple, state coal mine inspector. The report was submitted in connection with an investi-

gation of the explosion on Aug. 5, in which Alex McBirnie, fireboss of the mine, lost his life and four other miners had a narrow escape from death or serious injury. In both sides of the mine many unlawful and dangerous shots were found," Dalrymple's report states. "Some of these shots were dependent upon others. The explosion appears to have been caused by the spitting of the fuse of one shot, which ignited the gas in the mine. It is evident the deceased did not examine the mine for gas before tamping, as required by law. The first south entry of the mine was advanced 156 ft. ahead of the air current, or 96 ft. farther than the law allows, all of which indicates that supervision in the mine was lax."

### ILLINOIS

The Wenona Coal Co., Wenona, has been closed and the mining property will be dismantled.

The Black Star Coal Co., whose mine at Logan has been idle since last April, resumed mining Sept. 1, employing about 500 men.

The Ellisville Coal Mining Co., Ellisville, with main offices in Galesburg, has resumed operations at its principal mine, with two hundred men employed. The Cripple Creek mine of this company is operating about half time.

The Bohemian Coal Co., 332 South Michigan Avenue, Chicago, has been incorporated with capital of \$40,000 to deal in and mine coal. The incorporators are M. J. Cherry, Edward F. Morgan and Robert J. Byrne.

Mine No. 9, of the Consolidated Coal Co., Murphysboro, which was one of the largest in the state twenty years ago, will soon be a memory, as orders have been given to dismantle the property. The mine was originally planned to employ 600 men. Until recently about 200 have been at work. The Big Muddy River broke into the mine in 1921, flooding it, but was later pumped out. Trouble with water and quicksand is believed to be the cause for the decision to cease operations in the mine.

### INDIANA

The Sunlight Coal Co., Indianapolis, has increased its capital stock from \$150,000 to \$750,000.

The Tunnelton Freeport Coal Co., at Blaster, will begin operation soon, it was announced by an official of the company last week. The mine is in

pool 11, and the holdings contain nearly half a million tons of that variety. It is equipped with the very latest methods of mining and shipping. The main office is in Tunnelton.

### IOWA

A vein of coal twenty-three inches thick has been reached in the new Thomas mine near Guthrie Center, at a depth of 94 ft. The mine was started in April and will be producing this fall.

Larger mines of the state have prepared exhibits for the State Fair at Des Moines. L. E. Stamm, secretary of the state mine inspector's department, is in charge. Mr. Stamm reports that in 1923 6,000,000 tons of coal was mined in Iowa. In 1917 the total was 9,000,000 tons.

### KENTUCKY

Southland Coal Mine No. 1, Henderson, opened Aug. 20 after being closed since April 15. Only thirty men could be used, because the mine will work only one section for the present. Officials say that all the men needed are available at the wages offered. All mines in Henderson County—fifteen—are operating at present, half of them on short time, two or three days a week.

Governor William J. Fields recently appointed assistant mine inspectors for the eight districts of the state as follows: James M. Boettger, DeKoven. First District; John Cates, Second District; John F. Brown, Ashland. Third District; James Dixon, Pineville. Fourth District; H. F. Reed, Central City, Fifth District; Burgess Thompson, Jenkins, Sixth District; G. W. Rose, Prestonburg, Seventh District, and D. W. Logan, Pineville, Eighth District.

Fire of undetermined origin destroyed \$30,000 worth of property of the Empire Coal Co. at Empire, Christian County, Aug. 17. The blaze had gained such headway when discovered that in spite of the hard work of the miners and citizens generally none of the buildings could be saved and practically all the contents were destroyed, the most valuable being the electrical apparatus, which was a complete wreck. The power house, boiler room, tippie and blacksmith shop, all frame structures, were burned, and sparks set fire to the headframe. Work has been temporarily suspended but in a limited way can be resumed in about a week. The fire will throw sixty-five men out of work for the time being. In normal periods the company employs 125 men.





Courtesy U. S. Distributing Corp.

### Houses for Miners in the Village of Dietz

If this is a "camp" the word has become synonymous in Wyoming with comfort. Well fenced, green with verdure, and provided with large porches, conditions are favorable, though nature contributes little but bright skies and fair—too fair—weather.

## MISSOURI

Fire of undetermined origin destroyed the buildings of the W. H. Fewell coal mine, near Sedalia, on the night of Aug. 16. The property loss was \$12,000.

The purchase of \$111,500 worth of coal land in Henry County by the West Missouri Power Co., of Pleasant Hill, has been approved by the State Public Service Commission. The commission likewise approved the purchase by the Pleasant Hill company of the assets of the Fort Scott & Nevada Light, Heat, Water & Power Co., for \$645,000 for the purpose of consolidation, and authorized issues of \$220,500 in 7 per cent cumulative preferred stock and \$870,000 in 20-year 6½ per cent first mortgage bonds. The company purposes supplying fuel to its various power plants from the Henry County coal deposit.

## NEW YORK

The city school board of Buffalo has awarded the contract for furnishing 26,000 tons of smokeless coal for school purposes to the Weaver Coal Co., of Buffalo, on its bid of \$5.74 for mine run, delivered. The coal comes from Cambria Co., Pennsylvania, and is said to be similar to Pocahontas. The coal will be handled through the city trestles of Spaulding & Spaulding. It replaces anthracite.

## OHIO

The Dillon No. 6 mine of the Wheeling & Lake Erie Coal Co., Lafferty, has resumed operations, giving employment to 250 men. The resumption follows a change from slope to shaft mining.

Common Pleas Judge Sowers has named Alfred A. Taylor receiver for the Ohio Service Coal Co., a Columbus corporation, upon petition of William H. Young, one of the three trustees named by the court to settle the affairs of the company. The dissolution of the

company has been authorized by the stockholders. Mr. Young says that he has paid debts of the company in excess of \$20,000.

The Black Diamond Mines, located near Amesville, are being cleaned up preparatory to placing them in operation after an idleness of several months. In all about 100 men will be given employment.

H. H. Heiner, formerly president of the Maynard Coal Co., of Columbus, and a well-known producer, recently was operated on for appendicitis at a Columbus hospital. He is now on a fair road to recovery.

## PENNSYLVANIA

It is reported on good authority that the H. C. Frick Coke Co. expects to start operations soon at two of its idle mines in the New Salem district between Uniontown and Brownsville.

Operations of the Pennsylvania Coal & Coke Co. in July resulted in a deficit of \$47,000. This compares with a surplus of \$51,000 in July, 1923. In the first seven months of 1924 the loss was \$188,000 against a surplus of \$634,000 in the first seven months of 1923.

Residents of Aristes have formed a forest-fire company to be known as Anthracite Forest Fire Co. No. 2, of Aristes, which is the second of its kind in the country, Mt. Carmel having the first. The new company has received permission from the Lehigh Valley Coal Co. to occupy its ground and will create a community playground.

Details have just been completed at Pittsburgh for the purchase of approximately 2,200 acres of coal land in Wayne township, Greene County. The deal involves \$605,000 and makes the transaction the largest coal-land sale of the year in Pennsylvania. The deal was made through an official of the Mellon National Bank, acting, it is understood, for the Koppers company, a Mellon corporation. No

immediate operation of the tract is anticipated, the purchase being regarded as an investment to increase the Koppers company fuel reserves. This corporation already has large coal holdings in West Virginia and this latest Greene County purchase adjoins the northern limits of the southern field.

S. D. Dimmick and H. M. Warren, general manager and consulting electrical engineer respectively of the Glen Alden Coal Co., are making a visit to England, France, Belgium and Germany, including perhaps the Upper Silesian field. They will return about Sept. 15.

The Lehigh & Wilkes-Barre Coal Co. has started extensive repairs to its breaker at No. 4, Audenried, and when the improvements are completed the No. 5 breaker at Honey Brook will be abandoned. It is planned to handle the coal hauled from Green Mountain at the No. 4 plant. There was not sufficient coal to operate the two breakers.

The Bethel Coal Mining Co., operating Bethel No. 1, at Twin Rocks, near Ebensburg, has resumed operations. William C. Shiffer, of Ebensburg, who has been active in the development of the mining interests in Cambria County, is giving the Bethel mine his personal supervision. The company has signed a contract with the Producers' Coal & Coke Co., of Johnstown, to distribute the output of the mine.

Seward E. Button, president of the Beaver Coal Co. and former chief of the state Department of Mines, announces that he is about to build a new breaker at the mine, which is located near Mountain Grove, to replace the one that was destroyed during the labor outbreak last fall. The contract is already let. The breaker will handle 600 tons or more a day and will be finished Nov. 15.

Refusing to obey an order of the executive board of the United Mine Workers to return to work, miners employed in the Henrietta slope of the Henrietta Coal Mining Co., at Dunlo, Cambria County, who went on a strike on Aug. 16, are still out. A decision to remain out was reached at a meeting of the miners on Sunday, Aug. 24. The miners are attempting to force the company's coal inspector to join the union. Rule No. 29 of the scale agreement exempts coal inspectors and mine foremen from membership in the union.

Plans for reopening the old Neilson colliery workings, located at the southwestern limits of Shamokin borough, reached a definite stage last week when a force of carpenters began placing the shaft head in condition. The abandoned Neilson properties were recently purchased from the J. Langdon estate by the Shamokin Coal Co., a newly organized mining corporation which has just completed the floating of the major portion of a \$1,500,000 bond issue through New York security houses. The present breaker building, which was erected by the old Carbon Creek Coal Co. and subsequently sold under the sheriff's hammer, is to be repaired and will be used temporarily by



the new concern in the preparation of coal. Eventually, however, a large steel breaker is to be erected, it is said. It is reported that officials of the Lehigh Valley Coal Co. are interested in the new mining project and that the Neilson workings may be used ultimately in tapping the rich coal basin owned by the Lehigh company in the Edgewood Park section of Shamokin.

S. E. Van Horn, superintendent of the Olyphant and Eddy Creek collieries of the Hudson Coal Co. for the past fifteen years severed his connections with that company last week. The cause of Mr. Van Horn's leaving was not announced by the company. Mr. Van Horn was at one time assistant to the chief mining engineer of the Hudson company and is widely known in the entire anthracite region.

The Sharon Coke Co. has requested a federal permit to erect a new break-water crib and a new mooring crib at its mines on the right bank of the Monongahela River, four miles below Grays Landing.

Announcement by the Lehigh Valley Coal Co. of indefinite suspension of operations at the Centralia colliery comes as a severe blow to the populace of that enterprising town. A total of 1,500 men were thrown idle with the closing of the colliery. It is the purpose of the company to completely remodel the old breaker, supplanting it with a more modern structure. The work, it is estimated, will require fully four months.

Another mine in the Uniontown district resumed operation last week when Superintendent J. L. Keck, of the South Union mine of the Jamison interests, sent his first shift of diggers into the pit since the shutdown several months ago. Repairs were engaged in getting the mine in shape for a week. This was easily accomplished as everything in the mine is less than two years old and in first class condition. During the period of temporary idleness the men have never left the company houses and practically all of the old men will be given employment at once.

The dispute regarding the duties of an engineer at the Cranberry colliery, of the Lehigh Coal & Navigation Co., which resulted in a strike of all employees at the operation following the discharge of the engineer, has been placed in the hands of Joseph J. Walsh, chief of the State Department of Mines. The strike has been in effect several weeks.

## UTAH

Utah coal operators mined 364,948 tons during July compared with 355,466 during the same month last year. The figures for July, 1922, were 374,934 and in 1921 278,092.

The Martin Coal Co., of Salt Lake City, has received a contract for 7,700 tons of coal, mixed sizes, to be delivered to the city schools. The price was \$32,985.

The Great Western Coal Mines Co. has received permission from the State Securities Commission to sell 60,000 \$10 shares of preferred stock with a

bonus of ten shares of common stock for each share.

## WASHINGTON, D. C.

Receipts of the federal government from bonuses, royalties, and rentals under the law providing for the leasing of mineral rights on the public domain aggregated \$13,627,588 for the fiscal year ending June 30, 1924, according to the Interior Department. The largest receipts were obtained from leasing mineral lands in Wyoming, the amount being \$12,270,322. The second state in the size of receipts was California, with \$957,480. Receipts from other states follow: Montana, \$221,426; Alabama, \$85,460; Utah, \$35,402; Colorado, \$33,513; North Dakota, \$10,587; Washington, \$6,280; New Mexico, \$4,784; Louisiana, \$2,295; South Dakota, \$34.

The U. S. Civil Service Commission announces an open competitive examination for Junior Engineer, to be held throughout the country on Oct. 8, to fill vacancies in the Bureau of Standards, Bureau of Mines, Bureau of Chemistry, and various other branches of the government service, at an entrance salary of \$1,860 a year. Advancement in pay may be made without change in assignment up to \$2,400 a year. For appointment outside of Washington, D. C., it is probable that this same rate of pay will be applicable, but if not, the entrance salary will be from \$1,500 to \$2,000 a year. Full information and application blanks may be obtained from the U. S. Civil Service Commission, Washington, D. C., or the secretary of the board of U. S. civil-service examiners at the post office or custom house in any city.

## WEST VIRGINIA

The Jones & Laughlin Steel Co. is reported to have completed preparations for the opening and development of 15,000 acres of coal lands along the Monongahela River, near Dunkard. Operations are expected to begin about Nov. 1.

A deed was filed at Clarksville, Aug. 23, in the office of Clair N. Parish, clerk of the county court, transferring to the Allied Coal Co. a complete mining plant and 79.56 acres of coal in Clay district, Harrison County. The deed includes the mining rights together with all the mining equipment located on the premises and specifically states that the transaction is a sale in gross and not by the acre. Chester S. Shinn, C. H. Tarleton, Mary C. Tarleton, L. A. Riggs, Tusca Morris, Harriet B. Morris, Harry B. Crane, Edna D. Crane, Boyd S. Fleming and Eva B. Fleming, all of Fairmont, are the makers of the deed.

## WYOMING

The Union Pacific Coal Co. has ordered a shale dust pulverizing plant from the Williams Patent Pulverizer and Crusher Co. of St. Louis. The plant will pulverize from two to three tons of shale an hour to a texture which will admit of a minimum of ninety per cent of the dust passing through a 200-mesh screen. The plant

is expected to be in operation at Rock Springs before Oct. 1.

## CANADA

A meeting of the former employees of the Morden mine, at Nanaimo, was held Aug. 13 to consider the proposal of B. H. Brown and J. Arbuthnot, representatives of the West Coast Collieries, Ltd., that the men take stock in the company instead of the wages due to them, and thus enable the company to re-start work at the mine. The proposition was rejected and the Provincial Minister of Mines and Attorney General were advised of the decision.

A company has been formed to produce coke at St. John, N. B., the capital being largely from the United States. According to tests that have been made Minto coal has proven the most satisfactory. The intention is to build a plant at St. John, before the winter sets in.

The strike of miners in Alberta coal mines has caused a direct wage loss to the miners of something like \$2,500,000 in the four months, according to an estimate of John F. Stirling, chief inspector of mines for Alberta, based on the loss in coal production as compared with the same four months in 1923.

The Allan shaft will be reopened soon, according to representatives of the Dominion Coal Co. On June 30 an explosion occurred in this mine causing the loss of four lives. Following the explosion, a fire occurred which raged for about six weeks. An inspection of the mine recently by agents of the company in conjunction with representatives of the provincial government indicated that the fire had been extinguished by the company's fire fighters. T. J. Brown, Deputy Minister of Mines, has given his approval of the decision to reopen.

## Industrial Notes

The General Explosives Co., of Joplin, Mo., has been acquired by the DuPont Powder Co.

The Mine Safety Appliance Co., Pittsburgh, Pa., has entered into an agreement whereby that company becomes exclusive representative of the Bradley Pulverizer Co., Allentown, Pa., for the distribution of the latter's mills for pulverizing shale and limestone for rock-dusting purposes.

Important changes in the personnel and policies of the Bassick-Alemite Corporation and its subsidiaries are announced as a result of a recent meeting of the Board of Directors in New York. The Bassick-Alemite Corporation has purchased the Allyne-Zerk Co., which will be operated as an independent unit but under the same general management as the other units that make up the corporation. E. W. Bassick, of Bridgeport, Conn., as president of the corporation will take a more active part in the management of its affairs in the future. The general direction of the properties will be in the hands of an executive committee, headed by Mr. Bassick and including E. S. Evans, E. E. Allyne and James G. Alexander, vice-president of the Central Trust Co., Chicago. E. S. Evans, president of E. S. Evans & Co., a subsidiary, becomes vice-president of the Bassick-Alemite Corporation in charge of sales of all units of the corporation, including the Bassick Manufacturing Co., of Chicago, manufacturers of the Alemite High Pressure lubricating system, and the Allyne-Zerk Co., manufacturers of the Allyne-Zerk lubricating system.



## Traffic News

### Railroads to Fight Interstate Rate Cut to East St. Louis

Counsel for the thirteen railroads serving the inner group of coal mines adjacent to East St. Louis, Ill., have announced that an appeal will be taken from the recent decision of Circuit Judge George A. Crow, of Belleville, Ill., who on Aug. 15 declined to stay the order of the Illinois Commerce Commission reducing the intrastate freight rate on coal shipments to East St. Louis. Under the Illinois commission's ruling the rate on mines within 30 miles of East St. Louis was cut from 91c. to 70c. per ton while the rate on other miles of the inner group was reduced from 91c. to 80c. The case will go to the Illinois Supreme Court.

### Protests Coke Rates to Mobile

The Chamber of Commerce of Mobile, through its traffic department, has filed protest against the recently published rates on coke from points in Tennessee and Georgia to Mobile for export movement, alleging that such rates are unjustly discriminatory against Mobile and preferential to South Atlantic coast points, and asking a suspension of the tariff which was to have become effective Aug. 28.

### South Dakota Cuts Rates

The State Railroad Commission of South Dakota announces a general reduction of freight rates on steam coal to numerous points in that state, at the same time that rates from South Dakota to southern Minnesota points are increased under the ruling of the Interstate Commerce Commission. The change is effective Sept. 10 and affects many points in South Dakota. Watertown gets a reduction from \$4.32 to \$3.92; Huron from \$4.74 to \$4.31; Miller from \$5.10 for both steam and lump to \$4.95 on lump and \$4.51 on steam; Mobridge from \$6.16 on all sizes to \$5.29 on lump and \$4.86 on steam. Numerous other towns get similar reductions. Railroads serving the Lake Superior docks have made cuts of 40c. to a number of South Dakota points.

## Association Activities

The Central West Virginia Coal Operators Association was formed by a group of operators with open-shop mines in the Harrison County field of West Virginia at a preliminary meeting held at the Waldo Hotel in Clarksburg, W. Va., J. M. Orr, H. G. Smith, T. R. Craig, James Dudley and J. P. Keeley were named as members of a committee to apply for a charter, which was granted on Saturday, Aug. 23. Daniel Howard presided over the meeting, T. R. Craig acting as secretary. Approximately 25 operators enrolled as members, representing about 60 per cent of the tonnage produced in the Harrison County field. A committee was appointed at the first meeting to draft a set of by-laws and there will be another meeting soon to elect directors and officers.

Fred S. McConnell, of Cleveland, vice-president of the Enos Coal Mining Co., was elected president of the Indiana Coal Producers' Association, at the annual meeting held recently in Indianapolis. Hugh B. Lee, of Terre Haute, general manager of the Maumee Collieries Co., was elected

vice-president, and Michael Scollard, also of Terre Haute, is secretary-treasurer. The executive board is composed of the following: J. T. Moorman, president and general manager, Patoka Coal Co., Indianapolis; Wick Dixon, general manager, Modern Fourth Vein Coal Co., Jasonville, Ind.; R. H. Sherwood, president, Sherwood Coal Co., Indianapolis.

## Trade Literature

**Static Condensers for Power-Factor Correction.** Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Circular 1670. Pp. 20; 8x11 in.; illustrated. Discusses need for power-factor correction and methods of obtaining high power factor. Analyzes method of selecting proper corrective device for power factor.

The Mesta Machine Co., Pittsburgh, Pa. has issued a four-page folder giving results of tests with its **Una-Flow Engines**. A short illustrated description of these engines is also included.

**Westinghouse Fabrics and Papers.** The Westinghouse Electric and Manufacturing Co., East Pittsburgh, Pa. Folder 4532-A. Pp. 23; 4x7 in. This booklet should prove useful to all users of insulating material.

**Okonite Installations.** The Okonite Co., Passaic, N. J. Pp. 32; 9x12 in. This finely illustrated booklet is composed of views showing railroad and power installations of Okonite wires and cables.

The Ridgway Dynamo & Engine Co., Ridgway, Pa., recently issued Bulletin No. 21, which supersedes Bulletin No. 28, describing its turbo generator units. The bulletin is well illustrated with photographs and line drawings, has 27 pp. and measures 8x10½ in.

**The Improved "Rochlitz" Automatic Water Still.** Weber Bros. Metal Works, 108 North Jefferson St., Chicago, Ill. Pp. 8; 5½x8½ in.; illustrated. A combined condenser, purifier and aerator for producing a pure and palatable water for drinking and manufacturing purposes.

## Obituary

**Bushrod M. Watts**, formerly president of the Baltimore Coal Exchange and one of the best known figures in the retail coal trade of the East, died in Baltimore, Aug. 27 as a result of an attack of pneumonia. Mr. Watts had not been in the best of health for some years.

**James LeRoy Cook**, prominently identified with the coal industry of Salt Lake City as a sales manager for several years, is dead, following an acute attack of rheumatism of the heart. Mr. Cook was at one time associated with the United States Fuel Co., but at the time of his death was sales manager for the Kinney Coal Co. He was only 35 years of age.

## Coming Meetings

**New York State Coal Merchants Association, Inc.**, 14th annual convention, Sept. 4-6, Stamford-in-the-Catskills, N. Y.; headquarters Churchill Hall. Executive secretary, G. W. F. Woodside, Arkay Building, Albany, N. Y.

**American Chemical Society.** Fall convention Sept. 8-11, 1924, at Ithaca, N. Y. Secretary, Gas and Fuel Section, O. O. Malleis, the Koppers Co., Pittsburgh, Pa.

**Oklahoma Coal Operators' Association.** Annual meeting Sept. 11, 1924, McAlester, Okla. Secretary, A. C. Casey, McAlester, Okla.

**Association of Iron and Steel Electrical Engineers.** Annual meeting and exposition at Duquesne Garden, Pittsburgh, Pa., Sept. 15-20. Secretary, John F. Kelly, 1007 Empire Bldg., Pittsburgh, Pa.

**National Safety Council.** Thirteenth annual safety congress Sept. 29 to Oct. 3, Louisville, Ky. Managing director and secretary, W. H. Cameron, 168 No. Michigan Ave., Chicago, Ill.

**American Institute of Mining and Metallurgical Engineers.** Fall meeting, Birmingham, Ala., Oct. 13-15. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

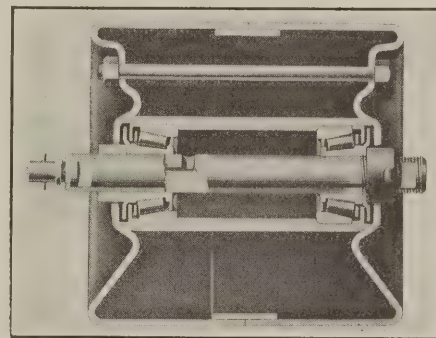
**American Institute of Electrical Engineers.** Fall convention, Pasadena, Calif., Oct. 13-17. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

## New Equipment

### Belt-Conveyor Carrier with Pressed-Steel Shell

Improvements to its belt-conveyor carriers have been announced by the Stearns Conveyor Co., of Cleveland. The pulley shell is made of pressed steel which, as compared with a cast-iron shell, has the advantages of lighter weight, greater strength, and better balance. The rounded edges prevent injury to the belt.

Antifriction bearings are used between the hardened steel shaft and the



### Cutaway Section of Carrier

The one-piece tube which forms the grease chamber is firmly held by the tapered ends of the pressed-steel shell.

one-piece tube which is held firmly in the tapered ends. Grease is forced by high pressure into the large chamber between the shaft and shell, and it is claimed that one filling is sufficient for a period of from six to twelve months. The design is such as to prevent dust from entering the bearings and to make it difficult for any foreign substances to accumulate on the outside of the pulley.

The advantages claimed are: Saving of power; increased life of belts and carriers; reduced costs of lubrication, inspection and maintenance; and more continuous service.

### Dump Car Operated by Steam From Locomotive

Recently an interesting type of automatic dump car was placed in service handling breaker refuse at the mines of the East Bear Ridge Colliery Co., Mahanoy Plane, Pa., in the anthracite region.

The side-door dump is operated by cylinders supplied with steam from the locomotive and is fully controlled by a single valve in the locomotive cab. If desired the dumping may be done while the car is in motion, the design being such that the material is deposited clear of the track.

This long type of dump car is of rugged steel construction and is designed with a low center of gravity. The car has a capacity of 20 tons and its overall dimensions are as follows: Length 16 ft., width 8 ft., height 7 ft. The bottom has a 45-deg. pitch and the track gage of this particular in-





**Locomotive Supplies Steam to Operate Dump**

The latching and unlatching as well as the opening and closing of the dump are controlled by one valve in the locomotive cab. The material is deposited several feet from the track.



stallation measures 36 in. Not only is provision made for braking by hand but a steam brake is provided which can be operated either independently, or in conjunction with the locomotive brake. All steam connections between

the car and locomotive are of flexible brass tubing, and the steam lines are cleared of water by automatic traps. The Bloomsburg Locomotive Works, of Bloomsburg, Pa., is the designer and builder of this car.

### Improved Grease Cup

A grease cup is a small item in a plant or factory, but it can be a nuisance and a cause of expense. Recognizing this, the Link-Belt Co., of Indianapolis, has developed a new top for their regular compression grease cup. This top is hexagonal in shape, which provides not only a good grip for the hand but also for a wrench. Cold, stiff grease makes a compression cup very hard to turn, and a pipe wrench is not always accessible. The hexagonal shape provides grip spaces for the ordinary wrench.

This cup is also provided with a raised slot so that it can be turned with a screwdriver, when it is so located that it is inconvenient for the hand or wrench.

### Loading Machine with Tread Similar to War Tank

A new portable loading device of the bucket type suitable for moving over soft, rough or uneven ground has been developed lately by the Jeffrey Manufacturing Co. This new machine, known as the Tanktred Loader, has an elevator boom designed along lines similar to the radial loader boom, but the three-wheel chassis is replaced by a tanktred crawler mounting, and the lower end of the boom is fitted with an effective clean-up device and scoop.

The loader has a capacity of  $1\frac{1}{2}$  to 2 cu.yd. per minute and will handle rough material. The framework of this member is built up of wood and steel to provide great strength and elasticity. Two strands of Hercules chain are used to carry the buckets. The latter are 18 in. long, of malleable iron, with high backs and renewable steel-digger edges. To receive the discharge from the elevator buckets, the top of the boom may be fitted with a swivel spout, to give as much as 11 ft. clearance from the ground. Or, in place of the swivel spout, a measuring, or batch hopper, with valve in the bottom, and having a capacity of about 21 cu.ft., may be substituted.

The tread proper consists of heavy steel plates, bolted to a chain made of cast-steel side bars, hardened steel knuckles and hardened steel pins. The

tread sprockets are heavy cast steel. The thrust from the under side of the tread is taken by chilled rollers, placed in proper position. The main weight of the machine is carried on these crawlers by a three-point suspension, to take care of rough and uneven ground.

The clean-up device consists of revolving spiders, having hardened-steel pin inserts and a plate-steel scoop. The heavy cast-iron spiders are brass-bushed and revolve on the extension of

the foot shaft to and through the scoop to the body of the machine. The steel-pin inserts are so placed as to loosen thoroughly compact material and carry it forward into the path of the buckets.

All the driving mechanism is mounted in a rigid steel and cast-iron, self-contained frame, which in turn is mounted on the framework proper of the machine. A heavy steel shelf supports the power unit so that all gears are in line and cannot get out of proper mesh. All gears are steel with cut teeth and the bearings are bronze-bushed and grease-oiled, which keeps out the dirt.

Operation is easily controlled by levers conveniently located and easily reached by a man standing on the platform which is attached to one of the tread frames. Each function of the machine is completely independent of the other. Propelling, steering and operation of the elevator are accomplished through multiple-disk clutches.

The treads are controlled by brake mechanism on the differential shaft making it possible to turn the machine on the center of either crawler as a pivot. The raising and lowering device is self-retained and automatically locks in any position. Provision is made for two speeds, both in the forward and reverse direction: The fast speed, 50 ft. per minute, for moving the machine from pile to pile, the slow speed, about 2 ft. per minute, for feeding into the material.

Lubrication, which is a vital factor in the life and efficient performance of any machine, is thoroughly and effectively taken care of by a high-pressure lubricating system, which embodies the much-favored explosive action. All bearings and moving parts are equipped with high-pressure fittings, so with the aid of a grease gun, all parts are quickly and easily lubricated.

This system, embodying the explosive action, not only forces the grease into otherwise inaccessible parts but forces out dirt and foreign substances.



**Loader for Traveling Over Rough or Soft Ground**

Control levers on the differential shaft are used to turn the machine either on the pivot wheel or the center of either crawler. High-pressure lubrication is applied to all bearings.



# COAL AGE

McGraw-Hill Company, Inc.  
James H. McGraw, *President*  
E. J. Mehren, *Vice-President*

Devoted to the Operating, Technical and Business  
Problems of the Coal-Mining Industry

R. Dawson Hall  
*Engineering Editor*

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Number 11

## Our Modern Proconsuls

ANCIENT ROME sent its proconsuls to rule over its conquered provinces. Gradually a system was established by these men which perpetuated their terms of office. They discovered some breach of discipline in those they ruled. This gave them a reason for invading their territories and for taking of their substance. Part of it they kept for themselves and part they used to provide pageants, gladiatorial and animal fights, races and bread for the people at home who, thus bribed, voted for their continuance in office. This form of graft was eminently successful and became eventually almost a fixed custom.

Our modern proconsuls, called politicians, do not rob foreigners but prey on their own people. They regularize their actions by false charges of violation of the laws. La Follette is a sample of such people. He has just announced that the coal men and railroads had combinations in restraint of trade and were robbing the farmer. They must be put under severe control so that the most numerous body in the electorate, the farmers, shall have cheaper coal and transportation. He made this statement despite the fact that bituminous coal was selling at a price below the cost of production in all the union mines and that mines were daily being closed either by the sheriff or voluntarily.

That is what is meant by bringing coal and the railroads into politics. It is a modern form of proconsular graft, only, as already stated, it is our own people and not foreigners who are victims of the political ambitions of these politicians who seek by false charges and the power of the state to create and perpetuate their tenure of office.

## "Be to Our Faults a Little Kind"

ON THE editorial desk lies a letter from an Englishman lately engaged, as he tells us, as superintendent in a mine in North America. He is having trouble in convincing his friends that the tales he has told about Orient, Zeigler and Lynch mines are not figments of a disordered imagination, and he wants some clippings from *Coal Age* to prove that his statements are justified. We remember receiving an inquiry for copies of the records made at Orient and Zeigler from an Australasian chief inspector. He was amazed at the hoisting performances described in our columns.

We say this of American mines not in pride but rather in defense. The coal industry in America has been generally condemned by those who do not know it, by its malicious, consistent, and unscrupulous enemies. They have declared it to be most deplorably inefficient. It should have some capable men, they say, enlisted in its improvement and development.

Every coal man in America knows that there are incapable coal men and inefficient coal mines in this country. That is not unnatural. There are village

smithies also, and there are big automobile plants. There are women knitting socks by hand, and there are big power-mills with many spindles. At the same time the average coal mine has an efficiency that averages well with other industrial operations, and some mines are noteworthy for their excellent management and the vastness of their activity. Coal mining is not perfected nor will it ever be perfect, but it is progressing, and these incredulous Englishmen are evidence that we have done something worth while.

When European engineers come over here they are disposed rather to wonder than to criticize. Nowhere in Europe are such tonnages produced per mine or per man. We do not have such elaborate plants and housing as France, Belgium, Germany, and probably Holland, but we are efficient. Yet that is the very quality which our skeptical fellow countrymen will not concede to us.

## Every One's Job Is Easier Than Ours

REMARKABLY easy is every man's job. We could do it much better than he can. We are like the man who had never handled a fiddle but supposed he could play it offhand if only one were given him.

All the world believes there is no trick about coal mining—except perhaps the art of excessive charging for coal. We are told on all hands that we are the veriest dubs at an ancient art. But do not be mistaken, ours is *some* job. If others took hold of it, they would find that out. By the way, some have tried it and have found out already. We will not mention names though a lot occur to us—men who have burned their fingers at it.

Railroading is a sizable job especially the work of Class I roads, those having an operating revenue of over \$1,000,000 a year. In the first quarter of this year they originated 8,016,439 car loads of which no less than 2,327,481 were of coal or coke. That is 29 per cent of the whole. Seeing that this has been an off year for coal and coke, more coal being consumed than was being mined, and that coal cars have a larger weight capacity than other cars, that is quite a large proportion. Let us inquire therefore as to weights carried. The total number of tons "originated" in that period was 276,352,426 tons; of this 115,413,844 tons were coal and coke. That is 41.7 per cent.

It is clear therefore that the coal companies that have to haul this coal to the railroads have quite a large job on their hands especially as the cars run from less than one ton to more than eight tons capacity and have to be hauled over roads which conditions do not permit to be graded satisfactorily. This transportation job is larger than coal men themselves realize and one that men outside the industry utterly fail to comprehend. Some of the coal is transported as much as five miles. Much, it is true, is not carried nearly so far. No one



knows how far the average distance is. A wild guess might place it at two miles. But whatever the distance the job is immense. Imagine transporting 40 per cent of the traffic of the Class I railroads and much of the other classes underground in small cars averaging perhaps one-thirtieth the size of those used by the railroads.

One reason for the ease with which coal is gathered and transported is the use of electricity. If the railroads had been as forehanded as the coal companies they would be performing their heavier haulage functions with greater economy and despatch and less annoyance to the public. But there again, we are operating the railroads! If only we could!

### Our Mine Shops

LARGE outputs, increasing use of machinery, long hauls and heavy cars are going to make mine shops increase in size and importance. They may become before long, wherever large companies concentrate the repair work of many operations as space-consuming and as imposing as the shops of some of the smaller Class I railroads.

The progress has been rapid. In the nineties a drill press, a forge, a bellows, an anvil, a few hammers, a quenching barrel, a paring knife, some spanners and wrenches, a hand grindstone, a box of taps and dies with hand pipe cutters, and a few carpenter's tools, not forgetting a two-man crosscut saw, together filled the need for tools at most bituminous mines. Today such mines have shops equipped with a lathe or two, a drill, pipe machine, hack saw, hammer, a bit shaper, grindstone and woodsaw all driven by power with perhaps a section serving as a foundry. In addition would be oxyacetylene and electric-welding equipment and conveniences for the winding and making of armatures—all these for one mine of moderate size. Ten years from now such equipment will be regarded as entirely inadequate. Steel cars, loading machinery, conveyors and perhaps steel props will make more and heavier equipment necessary.

### Part of a Larger Program

STABILIZATION of the coal business is dependent on a larger undertaking that proposes to iron out the fluctuations of all industry. If the railroad business, the steel, cement and automobile industries, construction and all other activities were not seasonal the coal business would be less irregular. Some uses for coal, however, are so seasonal that they will never be corrected till we use power in the summer to cool by tempered artificial ventilation our homes and our offices. Perhaps the day will come when industrial activity will be uniform and when power will make our buildings cool, but both hopes appear a long way off. Still publicity might introduce some such development as the latter, giving regulated, dry, cool, dustless air in place of uncertain, humid, hot and dirty drafts from windows or a disk fan which cause colds and sweep the papers off desks.

And strange to say in a trifling degree the desire to keep at least our refrigerators and our drinks cool intensifies the difficulties of the coal producer, for the retailers would be more anxious to sell coal, more active in urging it, and more ready to reduce the price if they were not busy peddling ice, and if they had their motive power free to distribute coal. The retailers by taking

on the sale of ice have been doing a little stabilizing of their own to the disadvantage of the coal industry.

Another source of irregularity is not due to an unequal need for coal but to an inequality of the ability to pay for it. When business is slack, industry and individuals lack money to buy coal and both wait as long as they can or dare before buying.

A long, long road lies ahead. In 1924 we find ourselves farther than in 1923 from the happy consummation, despite reports and advice galore. The only real cure is an economic and not an ethical or altruistic one. Give an equal demand the year long and suppress the business cycle, and the coal man's trouble is solved.

The consumer caused the irregularity and not the coal man. He will only cease to cause it when he wants coal the year round. Every movement of the government to save him, when he is short of coal, from the consequences of his folly makes him less frugal and weakens his dependence on himself. The coal industry that has to take the blame of all the consumer's faults sincerely hopes that he will reform because the coal man must ever accept vicarious punishment for the consumer's misdoings. Still there is little expectation that the consumer will be regenerated.

### International Courtesies

RECENTLY we were favored with a copy of a new publication entitled *The Colliery Engineer* published in London. It was a technical journal covering the coal industry. As *Coal Age* had purchased *The Colliery Engineer*, of Scranton, some years back, a paper with a long and honorable record, and had borne on the title page for years the legend "Coal Age with Which Is Consolidated The Colliery Engineer" we looked with some dismay on this new publication which tried apparently to obtain a glory that did not rightly belong to it.

The company which publishes this paper is also publisher of the "*Railway Engineer*" the "*Power Engineer*" and the "*Marine Engineer*," and it was only natural for it in entering the colliery engineering field to follow its former practice and add to its list of publications that of "*The Colliery Engineer*." An exchange of courteous correspondence, however, made the British publishing house decide that it would be an act of consideration to change its name to "*Colliery Engineering*" and in a letter dated Aug. 20 it inclosed an editorial of which we reprint the follow paragraph.

"It has been pointed out by the proprietors of our esteemed contemporary that they like to regard the whole of technical literature printed in the English language as a unity, whether the publication be in Great Britain, in one of the English-speaking British colonies or in the United States, and that consequently they believe that any duplication that leads to confusion is undesirable. With these sentiments we are in cordial agreement, and accordingly we have adopted the suggestion, so courteously made, that the title of this journal should in future be *Colliery Engineering* instead of that originally selected."

*Coal Age* wishes to thank *Colliery Engineering* on its kindly acceptance of the suggestion and anticipates for its contemporary the best of success, which, indeed, the character and appearance of its issues seem destined to assure it. In no other country than Great Britain, we believe, is a detestation of literary piracy in any of its many forms more heartily disapproved.





General View, Dudley Coal Co. Tipple

## Dudley Mine's Unusual Dump and Picking Methods

Revolving Dump Drops Coal to a Boom That Feeds a Steel-Tube or Storage Bin—Each Carload Passes Over Boom Alone and Consequently Every Man's Product Gets Individual Inspection

BY W. R. COLE

Mining Engineer, Kentucky River Coal Corporation,  
Hazard, Ky.

**A**T THE HEAD of Caudill Branch of Rockhouse Creek, a tributary of the North Fork of the Kentucky River, is located one of the best equipped coal operations in the Hazard field, that of the Dudley Coal Co.

In addition to 300 acres of No. 7 and 600 acres of No. 6 coal, this company also owns 2,325 acres of the No. 4 bed estimated to contain 16,000,000 tons. As the interval between the No. 4 and No. 6 measures at this mine is 330 ft. it was believed that it would not injure the upper bed to work the lower one first. Adequate equipment for operating the No. 4 bed could be installed for a smaller outlay than would have been necessary for the upper deposits. Furthermore, contrary to the conditions usually encountered, the No. 4 seam was here as thick as either of the upper beds and contained a better quality of coal.

The No. 4 bed is only 90 ft. above the railroad. As the hills are high in this vicinity, this measure contains a large area of coal lying in an unbroken body, not cut up by erosion like the coal beds at many operations in this field.

Openings into the coal were made on both sides of Caudill Branch. This stream, as shown by the accompanying map, extends about 3,000 ft. into the property. In order to provide for rapid development seven different openings were made, the coal produced being hauled around the hill to the tipple on outside tramroads. At present, however, the haulage has been concentrated inside the mine, loads being gathered to suitably located central points and brought out from the No. 1 mine opening on the east side of the branch and through the portal of the No. 4 mine on the west side.

Mining is conducted according to the panel system. On account of the erosion of Caudill Branch, it has not

as yet been possible to make all the panels of the same size either in length or width. When the outcrop stage of working has been passed, however, it is planned to make all panels 350 x 1,000 ft. with a 50-ft. pillar separating them. A 150-ft. barrier pillar will protect the entries.

### PILLAR WIDTHS COMMENSURATE WITH OVERBURDEN

Near the outcrop, rooms were turned on 50-ft. centers and driven 22 to 24 ft. wide. Since the workings have been extended well under the hill, however, the centers have been increased to 60 ft., leaving an average pillar about 37 ft. wide. This is thought to be adequate, as the average overburden is only about 400 ft. and at the maximum 900 ft. thick. Should conditions appear to warrant it, however, the pillar width will be increased still more.

Pillars are robbed to within 50 ft. of the entry. When the last rooms are finished, the entry stump, chain pillar and 50-ft. panel pillar are drawn back. These pillars are robbed by machine on the butt-off system. If the roof conditions are favorable, which is generally the case, even the 6-ft. stumps produced in drawing back the pillar are cut with the machine. If, however, the roof is weak, these stumps are taken out with the pick. So far the pillar work has been highly successful and the total recovery of coal, including an estimated 4 per cent loss in handling and preparation, is 92 per cent of the merchantable coal in the bed.

On all main aircourses, brattices are made of cut stone. This is quarried from the nearby hillsides and plastered with cement. Though this may seem rather extravagant at first blush, it must be remembered that from the outcrop the mine will extend 8,800 ft. to the rear and about 5,600 ft. on either side before another



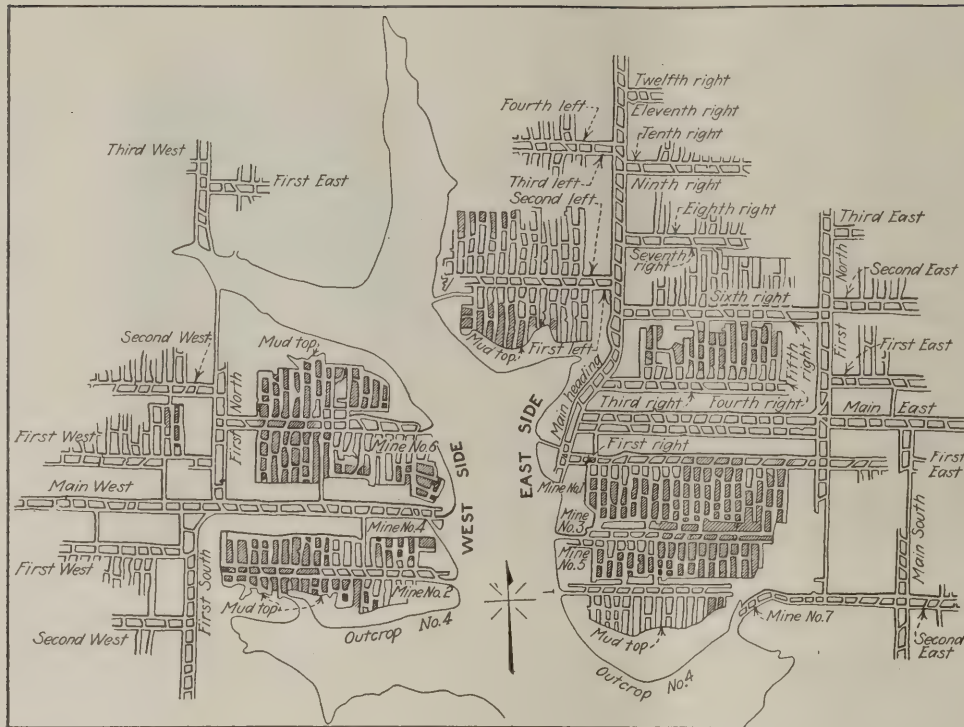


FIG. 1

### Map of Dudley Coal Co. Development

In order to attain an output quickly drifts were driven into the bed at various points along the outcrop, the coal being hauled to the tippie over surface tramways skirting the hill. After a number of headings and rooms had been driven, however, the loads were assembled at partings underground and hauled out from two openings one on either side of "the hollow."

opening can be made to daylight. This shows the economy of building tight stoppings.

Entries are driven 15 ft. wide and the track placed close to one rib with a 3-ft. walkway along the other side. This enables employees to go in and through the mine without traveling on the track, except at cross entries.

Forty-pound steel is used on all main haulroads and 25-lb. rails in the rooms. All switch points both in entries and rooms are provided with switch stands. These are of the upright type and are easily operated. Though they hold the switch points rigidly in place when set, it is only necessary to throw the lever off center for the weight of the ball to carry it the rest of the way.

The use of the upright switch in mines has been much criticised. This is because a man is likely to trip over it while working or to have such difficulty in throwing it that when resting his weight on the handle he may be thrown by its decreased resistance in front of the locomotive.

At the Dudley mine plenty of clearance is maintained between the rib and the rail. Ample space thus is afforded for the snapper. As demonstrated by the manager, the trip rider can travel ahead of his trip and readily throw the switches from an upright position. With the ground throw type, on the other hand, he must first stoop down and lift the switch lever up, and then throw it down on the other side. In either case, should the switch stick or give way suddenly, he

FIG. 2  
Room Face

Excellent roof conditions prevail in this mine, as may be judged from this picture. Note the band or parting of "jackrock" plainly visible in the coal at approximately the elevation of the hands of the man on the right. This is the only impurity found in this bed, and as it does not adhere to the coal, either above or below, it may be separated easily and gobbed. The upper bench of coal in this bed is quite uniform, variation in thickness being confined almost entirely to the bench below the parting.







Fig 3—Loads at No. 1 Driftmouth

Two things are noticeable in this picture—the blocky nature of the coal and the extreme length of the car-wheel hubs. The first is responsible for the large percentage of lump in the product shipped; the second affords a ready means of holding the car in the rotary dump when it is in the overturned position.

is likely to be thrown off his balance. Should this occur when he is in a forward-leaning position his head probably would be pushed across the rail in front of the car or locomotive, and should he slip or fall his whole body would be thrown directly in front of the trip. This very thing has occurred upon many occasions.

The No. 4, or Fireclay, bed yields an excellent all-purpose fuel. It is free-burning and practically clinkerless, low in sulphur, with a fusing point for its ash of 3,000 deg. F., or considerably above the maximum temperature attained in the average boiler furnace. Tests made with this coal in the metallurgical furnace have proved it to be clinkerless, the grate bars being left perfectly clean. It also has been proved by test to be an excellent gas and byproduct coal. A characteristic analysis of the bed is as in Table I.

Table I—Analysis No. 4 Bed, Dudley Mine

	Percentage
Moisture .....	1.64
Volatile matter .....	37.14
Fixed carbon .....	57.63
Ash .....	3.59
Total .....	100.00
Sulphur .....	0.65
Thermal value .....	14,502 B.t.u.

With all the different markets available, this company has made elaborate preparations to size its product carefully and to free it from refuse.

#### VARIATIONS IN THICKNESS IN LOWER BENCH

The bed varies in thickness from 40 in. to 6 ft., having an average thickness of about 56 in. A 3- to 4-in. band of flint clay, locally known as "jackrock," occurs from 6 to 24 in. from the bottom. It is characteristic of this measure in this vicinity to increase in thickness as the bottom dips, so that, though the bench above the parting is quite regularly about 42 in. thick, the thickness of the bench below the "jackrock" varies appreciably.

As this parting is too hard to be cut by a mining machine, the coal is mined below it and shot down in the usual manner. The upper bench is then loaded

off the parting, which does not adhere to the coal either above or below. The "jackrock" itself is then taken up, loaded out in the entries or gobbled in the rooms, leaving nothing but clean coal in the bottom bench.

The motive equipment in this mine consists of two 5-ton combination storage and trolley locomotives, and five 6-ton trolley and cable-reel machines. The mine cars are of the solid-box type equipped with roller bearings.

A headhouse has been built on each side of the branch, and the coal is discharged by a hand-controlled revolving dump. The car wheels have extended hubs which run under an angle bar on the dump and are thus held firmly in place. When the dump is empty the first car is run into it, and the entire device is turned off center by means of a large hand wheel. The dump then operates, the car remaining in an overturned position, where it is held in place by the angle bars.

#### CAR DISCHARGED ON REVOLVING TWIN DUMP

The opposite side of the dump is equipped with a similar arrangement of track and angle bars, and a car run into it is dumped in a similar manner. The dump moves through an angle of 180 deg., the weight of the loaded car bringing the empty to its original upright position. It is bumped off the dump by another loaded car, and the process is continued until an entire trip has been discharged, leaving an empty car hanging on the under side of the dump for the first car of the next trip to right. It requires but small effort on the part of the dumper to throw the first car over, and as there is but little machinery connected with this equipment, it has given splendid satisfaction ever since its installation.

From a small bin under the dump the coal is conveyed through an inclined steel tube 36 in. in diameter and 80 ft. long to a plate conveyer and thence to the shaker screens. A similar equipment is placed on the opposite hillside, and the coal is brought to a common point by the two conveyors, which together span the narrow valley.

On the east side of the branch a storage bin of about 300 tons capacity has recently been installed, being built over and around the steel tube. This is filled by means of a traveling feeder and loading boom so arranged as to allow the coal to go into the bin or



Fig. 4—One of the Horizontal Conveyors

These conveyors, of which there are two, furnish an excellent opportunity for picking extraneous material from the coal. Naturally some of the "jackrock" parting escapes the gob underground and finds its way to the surface.



FIG. 5

**The Tipple**

Coal is dumped into bins below the headhouses upon either side of the valley and slides gently down the tubular steel chutes to the horizontal conveyors, which transport it to the shaking screens in the tipple proper. Ordinarily three sizes are made, the two larger grades being lowered into the railroad cars by means of loading booms. Run of mine also may be shipped.



the tube at will. The rear end of this loading boom has no vertical movement and forms a picking table.

In operation each carload of coal is run over this picking table before another one is dumped and a man stationed there gives the coal its first cleaning. Though, of course, all the refuse cannot be removed at this point, yet this man can check up on each car that is dumped, and the management is able to tell exactly which men are loading dirty coal and make a fair estimate of the quantity of dirt loaded. A noticeable change for the better has been observed.

Again, the coal is let down to the bin with only a slight drop and slides down the sheet-iron bottom with small momentum. As a result there is no crushing or jamming of the coal at the bottom as is frequently the case when coal is dumped into a bin from a mine car direct. The bin can be loaded evenly from top to bottom and the coal slides freely throughout its entire length when it is being emptied from the bottom. As a result the product is transferred from the mine car to the shakers with little breakage. As soon as the business in sight demands it, similar equipment will be placed on the other side of the valley.

From the shaking screens the lump and egg sizes are delivered to railroad cars by loading booms. Four men are placed at each of these conveyors so that at this point the coal gets another picking. In addition two men are kept on each railroad car to remove whatever refuse has been overlooked by the others. An exceptionally fine product is the result.

By using different screen plates 2-, 4- and 6-in. lump, 2-in. and 2x4-in. egg, as well as screenings and mine run can be furnished. The egg coal is all rescreened before reaching the picking tables. Railroad cars are handled under the tipple by means of counterbalanced car retarders.

Power is furnished by the Kentucky & West Virginia Power Co. from its plant at Lothair, Ky. Current is transmitted at 3,300 volts to the local substation, where it is converted to 300-volt direct current by a 150-kw. Ridgway motor-generator set. This substation is built of cut stone and presents an extremely neat appearance, as do all the other buildings of this company.

The miners' houses are kept well painted and clean. All are supplied with running water and most of them have bathrooms. Consequently the dirt and disorder that make so many mining camps depressing are here conspicuous only by their absence.

### Bulletin Board Conspicuous Feature at Donk Bros. Coal Co.

A MINE property is not usually considered a picturesque place. The nature of its product and the equipment employed does not always present a pleasing appearance. Nevertheless, one is often pleasantly surprised to find a mine yard filled with well-designed buildings, and the miner provided with every convenience found in modern manufacturing plants.

The illustration shows the design of a bulletin board at the Thermal Mine No. 4 of Donk Bros. Coal Co.,

**Bulletin Board for Mine Yard**

This board attracts the workman to it because it shelters him from the sun, rain, or wind. Notices are always kept clean and dry so that they can be easily read.

near Edwardsville, Ill. The structure is permanently located near the mine shaft, being erected on a concrete platform. Shelter for the board and the workmen while reading the bulletins is provided. During the night or on dark afternoons the whole structure is lighted by electric lamps shown under the eaves.

The shelter and lights around this board attract miners to it and impel them read the notices which have been posted.



# Repairing a Broken Gear Tooth by Means of Studs

Several Ways Available for Repairing Broken Teeth—  
Studding Is the Simplest—An Accurate Template Is  
Necessary to Which Inserted Studs Must Be Fitted

BY G. H. RADEBAUGH  
University of Illinois, Urbana, Ill.

**G**EARS of cast or malleable iron are often damaged by the imperfect meshing of their teeth. To prevent unnecessary wear all gears should mesh closely. This means that their working centers must be definitely established and accurately maintained. Teeth in gear wheels are broken from overloading of the drive, from the dropping of tools between the teeth or from the wedging of other objects or substances between them.

Broken gear teeth can be repaired by any one of several methods: (1) If a tooth broken from the gear is in one piece it can be welded back into place by means of the acetylene torch. Such a job can be done most conveniently in a commercial welding shop. (2) This same type of break can be brazed in the mine forge. (3) A new tooth can be made and dovetailed into the gear. This type of job also can be done most effectively in a commercial repair shop. (4) A new tooth

When gear teeth are worn appreciably and some of them are broken some consideration should be given to the problem whether it would be cheaper and more expedient to obtain a new gear than to patch up the old one. If the teeth are not worn too much the old gear can be used as a pattern and a new gear cast from it. In preparing an old gear for use as a pattern it should be thoroughly washed in gasoline (Fig. 3) which removes all grease. The worn teeth can then be built out to the proper contour by using beeswax. Teeth that are missing, as in the gear here shown, can be shaped from wood and correctly positioned on the gear. The proper shape of the teeth can be gaged from another gear of the same pitch. The finished pattern can then be taken to a foundry and a casting made from it.

If it is decided to make the repair in the mine shop by inserting studs, the uneven surface left by the

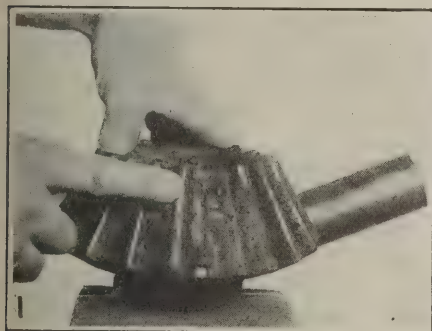


Fig. 1—Inspection of Wheel

Anything that will break one gear tooth may break or crack others. When the damaged wheel has been removed from its shaft it should be carefully inspected and the entire extent of the damage done should be ascertained.

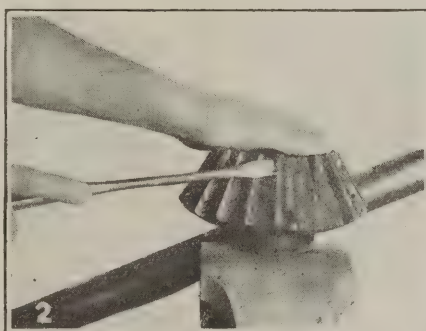


Fig. 2—Scraping off Adhering Dirt

Any exposed lubricated surface is a dust catcher. With a gear this material packs tightly between the teeth. A screw driver is an effective instrument for its removal, and it should be scraped away before repairs are begun.

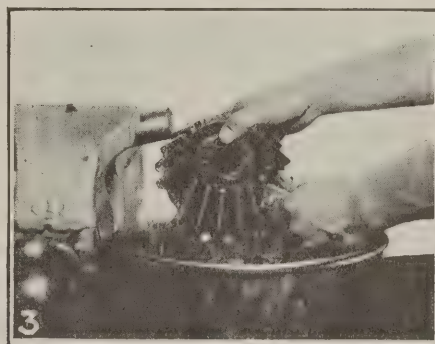


Fig. 3—Removing all Grease

Before attempting to use an old gear as a pattern from which to cast a new one or before making other repairs, all grease should be removed from it. This may be one by washing the gear in gasoline which readily "cuts" grease.

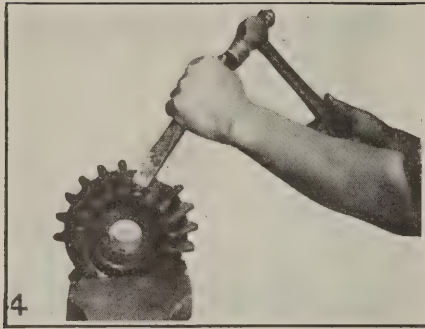
may be thermit cast to the wheel. (5) A new tooth may be built up by acetylene or electric welding or (6) studs may be substituted for the broken tooth. This latter is the simplest method of repairing broken teeth in a spur or bevel gear. At best, however, it is only a temporary repair, but it can be made in the mine shop. The only equipment necessary is a drill and a few hand tools.

After the gear has been removed from its shaft a careful inspection (Fig. 1) should be made to see if other teeth have been broken or cracked. In the job illustrated it was found that grease and dirt had accumulated between the teeth and had become solidly packed there. This caused the gear to be crowded away from its proper working position. Power was then transmitted from a point near the tips of the teeth. This in all probability, was the cause of the teeth breaking. Packed dirt and scale should be removed. The best method is to loosen it up with a screw driver or some similar instrument, as shown in Fig. 2. After this has been done a much more thorough inspection can be made of the remaining teeth.

broken tooth must be removed. This can be done most expeditiously with a flat chisel and a square file as shown in Fig. 4. To assist in maintaining the location of the tooth the break should not be filed down too far; the outline of the tooth base should be left. Notice in Fig. 5 how prominently this tooth location appears. In succeeding operations the layout is gaged by this tooth outline. In determining what size of stud to use, the width of the tooth at its widest place should be measured. The stud should be of a diameter equal to this width or a little larger.

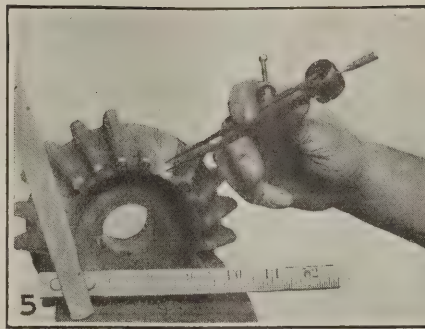
To obtain a good tooth layout, the surface may be chalked and a line drawn down the center of the tooth base. The dividers are then set to the required distance and the stud centers located. To provide for accurate drilling, the centers of the stud holes should be center-punched on the layout lines, as shown in Fig. 6. It always pays to take enough time to lay out the tooth correctly. If the hole centers are correctly located and properly drilled, the shaping of the studs is much easier than if the holes are drilled more or less at random. To patch a bevel gear is a much more difficult





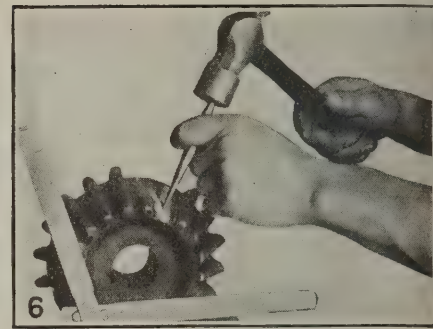
**Fig. 4—Chipping the Tooth Base**

The uneven surface left by the tooth break must be removed before repair operations proper can be started. This work is most readily performed by means of the flat chisel and square file.



**Fig. 5—Laying out Stud Holes**

After the old tooth base has been smoothed off it should be chalked so that the stud-hole layout may be plainly marked. Attention to small details will often make subsequent operations easy.



**Fig. 6—Center-Punching the Holes**

In order to obtain a good finished job it is necessary that the stud holes shall be drilled accurately and in line. A careful layout and deep accurate center punching of holes are essential.

job than to make a similar repair of a spur gear. In the patching of either type of gear, however, it is necessary to maintain the proper location of the teeth.

This can be done most accurately by using a template made from cardboard or tin. A good template can be cut from a piece of extra-thin tin that can be sheared easily with ordinary cloth scissors. This kind of tin can be found in the lids of paint cans. To obtain an accurate layout of the tooth shape, the template should be made to cover or embrace three or four teeth. In laying it out as shown in Fig. 7 the outline of the teeth can be transferred to the tin by using a scriber or scratch awl. The template is cut to the required layout as shown in Fig. 8, care being exercised in following closely the layout lines previously made with the scriber.

Lines can be followed much more easily with the scissors than with tinner's snips. This is the reason for using the extra thin tin, as it would not be permissible to cut tin of usual thickness except with the snips. The template may be checked on the good teeth, as seen in Fig. 9. When putting in two sets of studs, as was necessary in the job illustrated, they must not only be shaped properly but should have the correct pitch, that is, be set the proper distance from the center of one tooth to the center of the next. The template, then, must fit not only the shape of one tooth at a time, but must fit on all the teeth. If it does not fit accurately, the shape of its contour can be corrected by filing or by trimming with the scissors.

After the template is completed, the holes in the gear are drilled, their location having been previously laid out. In selecting the drill a size should be chosen that will permit the tap to cut a full thread. In threading holes of this kind it is advisable to use the complete set of machinist's hand taps. These are made in sets

of three, each set consisting of a taper tap, a plug, and a bottoming tap.

In Fig. 10 the taper tap is shown in the hole starting to cut the thread. This tap is tapered for about half its length. The next tap to use would be the plug tap. It is used to thread holes through which it is impossible to run the taper tap. It is tapered for a length of about four threads. The bottoming tap, which follows the plug tap, has a full thread to its point. It is used in threading a blind hole to its bottom. All of these taps are of the same diameter and each will cut a full thread. It is commonly supposed by many that they are of different diameters.

#### BREAKING TAPS MAY CAUSE MUCH TROUBLE

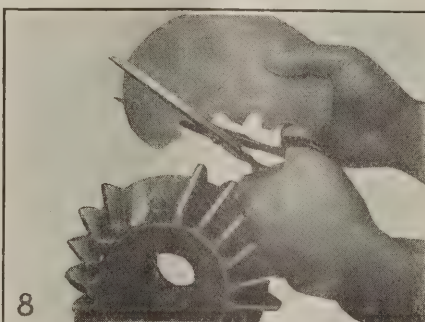
Tapping a hole, especially one of small size, is a somewhat delicate operation, as there is always danger of breaking the tap. If used correctly taps should never break in service. In use the pull on the wrench should be equal on both ends. A tap should never be turned with one end of a wrench, as the pull is unequal, and an excess stress will be placed upon the tap, which may cause it to break. This is one reason why the use of a monkey wrench for tapping is never recommended. A good tap wrench will more than pay for itself in a short time.

Breaking of taps can be reduced greatly by proper lubrication. For tapping steel or iron a mixture of 10 per cent graphite and 90 per cent tallow gives good results. Machine oil is a less desirable tapping lubricant. For cast iron, lard oil may be used; however, any oil has the disadvantage of causing the chips to stick to the tap flutes. This may cause the tap to bind and tear the threads. Kerosene is often used when tapping cast iron.



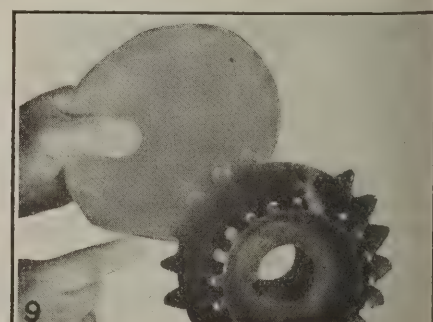
**Fig. 7—Scribing a Template**

A piece of soft tin makes the best template. This is laid against the ends of uninjured teeth and their outlines or contours carefully scratched upon it by means of a scriber. The template should embrace several teeth.



**Fig. 8—Cutting the Template**

Ordinary paper or cloth shears or scissors should be used in following the scribed lines upon the template. They will perform more rapid and accurate work than will common tin snips, but the tin used should be light.



**Fig. 9—Trying the Template**

In order to be of value a template must be accurate. After it has been cut out with the shears it should be tested on the gear teeth and any inaccuracies found should be corrected either with the scissors or with a file.



Removing a tap broken off in a hole is a job requiring much skill. In Fig. 11 is shown one of the best methods for removing broken taps. It often happens, however, that this scheme will not loosen the tap, and other methods must be employed. When trying to remove a broken tap with two punches as shown, most failures result from too strong and unequal blows from the hammers. It should be remembered that extremely light blows delivered simultaneously and with equal force generally will remove the stub; heavy unequal blows delivered separately accomplish little.

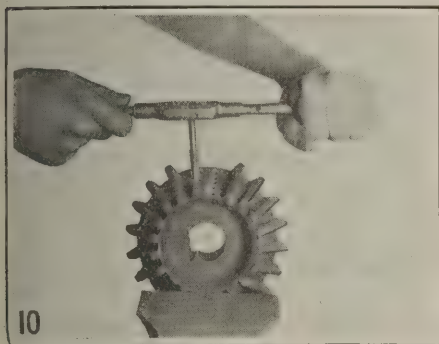


Fig. 10—Tapping the Stud Holes

If possible a tap wrench should be used, to either end of which an equal pressure should be applied. Using a monkey wrench or other means of turning a tap is liable to cause trouble.

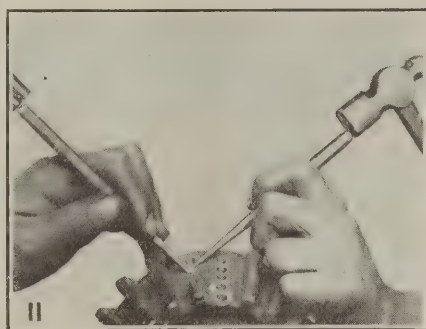


Fig. 11—Removing a Broken Tap

Taps should be amply strong, but they sometimes break. In most cases they can be backed out by light simultaneous blows delivered to punches placed on opposite sides of the broken portion.

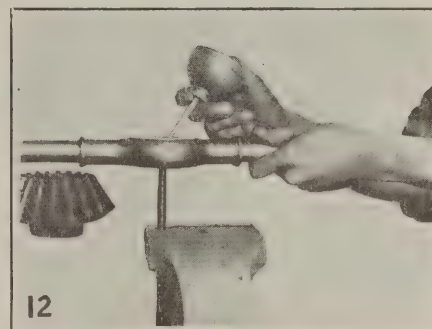


Fig. 12—Threading a Stud

Though commercial cap screws may be used, repair studs generally should be made from rod stock. After the thread has been well started the die should be reversed, cutting the thread to a shoulder.

Another method sometimes used to remove broken taps is that of annealing the tap stub and then drilling it out. This method involves heating the entire job and consumes much time. Dilute nitric acid, in the proportion of about one part acid to five parts of water, injected into the hole loosens the tap so it usually can be removed readily. The acid mixture, however, should be thoroughly washed out of the hole, as otherwise it will continue to eat the threads. Before re-entering a new tap, one should be absolutely sure that no fragments of the broken tap remain in the hole.

When the holes have been tapped, they are ready to

half in two, making the stud a little longer than required. This extra stock is left for finishing.

The ordinary method of cutting off metal is to use a hack saw. The blade is held in a frame deep enough to allow the severing of any ordinary thickness of metal. For most work the hand frame is used, the workman operating the saw with a back-and-forward stroke while the work is held in the vise or in some other convenient position, as shown in Fig. 13.

The hard service required of hack saws demands that the material of the blades be of the best and that the number, shape and set of the teeth be carefully con-

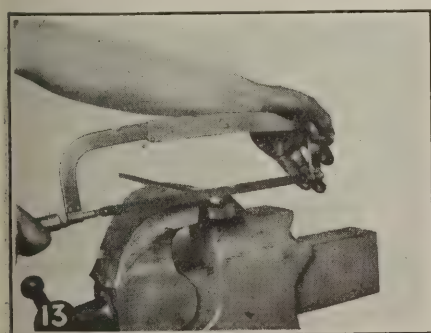


Fig. 13—Cutting Stud to Length

After the stud is threaded the rod may be placed in the vise and sawed partly in two. It should be cut slightly longer than needed for the finished tooth, the surplus length being removed by a file.

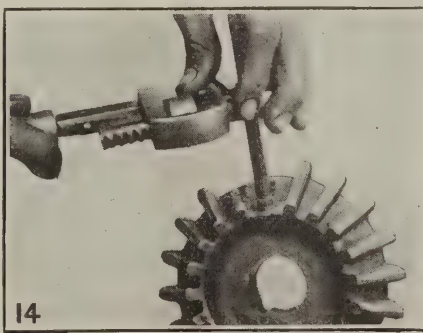


Fig. 14—Screwing in the Stud

A stillson or trino wrench may be used on the partly sawn-off rod to force the threaded end home. When screwed to place it is absolutely necessary that the stud be tight and solid in the tapped hole.

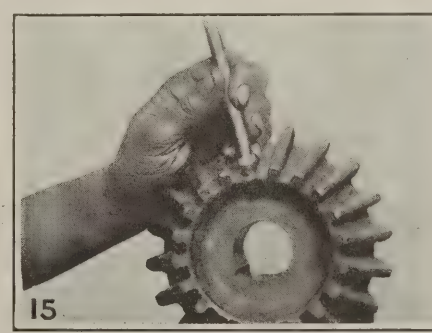


Fig. 15—Breaking off the Rod

When the stud has been screwed home the rod may be broken from it by bending back and forth. It was to facilitate this severance from the stud that the rod was cut partly in two after it was threaded.

receive the studs. Standard cap screws can be used for these studs but are more expensive than studs made from a piece of round stock. The best way to make a stud so that it will fit into the hole already tapped, firmly and without play, is to cut the thread with the die matching the tap used. The thread should be started on the end of the rod, which previously has been rounded off on the grinding wheel or with a file, with the stock and die in the usual position, that is, with the taper down.

It is obvious that the best work cannot be done on all kinds of metals with the same saw. Some are adapted to cutting hard, brittle metals, whereas others are suited to soft ones. It is also apparent that some saws work most advantageously on thin sheets and others on heavy sections. The blade should be well stressed in the frame with the rake or the teeth forward. Downward pressure should be exerted on the forward stroke so that the blade will "take hold." A lighter pressure is applied on the return stroke. A



blade should never be bent sidewise and the saw should be operated at about fifty strokes per minute. By keeping the saw as nearly as possible in the plane of the cut and thus avoiding wrenching it, the number of blade breakages will be reduced.

After the saw cut has been carried half way through the rod the threaded end is screwed into position, as shown in Fig. 14. The rod is then broken from the stud, as shown in Fig. 15. Whenever possible, that is, if the stud is screwed through the wheel rim, the end should be riveted over. This makes a much stronger job.

The studs, however, can be rusted in place. This can be done by applying to each stud before it is started in the hole a rust cement. By using such a cement galvanic action sets in quickly and the iron swells, through the formation of iron oxide, thus securely fastening the stud and gear together. The most common of rust cements is made with 2 parts of sal ammoniac, 1 part sulphur, and 60 parts iron dust or filings. These ingredients are mixed and water containing  $\frac{1}{2}$  part vinegar is added until a paste is formed.

The stud must screw into the tapped hole "good and tight." A loose fit will not do at all; if the stud fits loosely the die should be adjusted to cut a larger thread. Studs are screwed into all the holes and are then filed to the shape and position called for by the template, as shown in Fig. 16. The best file to use on a job of this kind is the half round, bastard cut. It is much easier to shape the studs with the half-round file than with other shapes, as, with it, it is possible to work on their sides as well as on their tops.

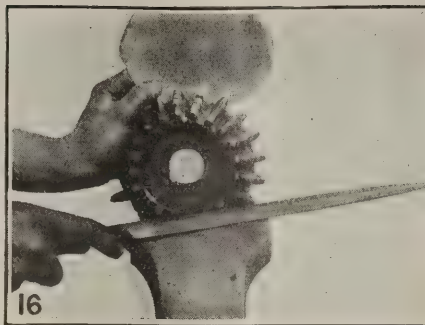


Fig. 16—Filing to Template

After all studs have been inserted they are filed to the proper contour. Frequent use should be made of the template during this operation to make sure that not only the contour but the pitch is correct.

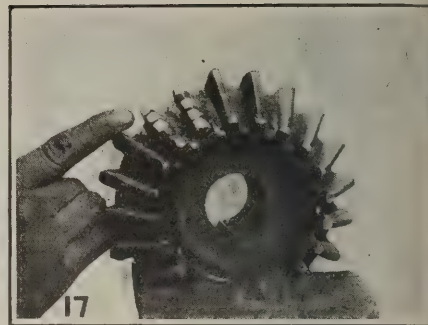


Fig. 17—The Finished Job

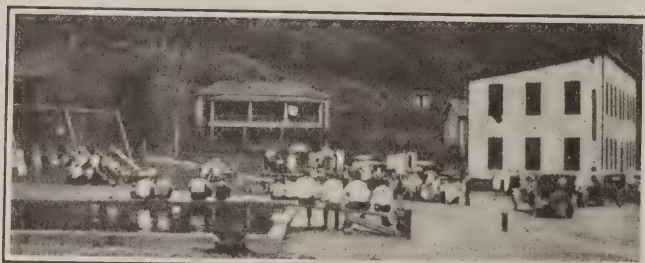
When all studs have been filed to the correct contour and pitch and the template fits accurately, the job of repair is finished. The gear may now be returned to its shaft and be put again into service.

If the job checks with the template, it is ready to be put back in service. Attention is called to the finished job as shown in Fig. 17. In this case seven studs were required to make the patch. After the gear is re-mounted on the shaft and put in mesh with its running mate, the drive should be turned over by hand and the job checked to be absolutely sure the studs mesh properly with the gear. If they bind, the high spots will be clearly defined by friction marks. These should be filed off before power is applied.

Such a repair as has been described must of course be considered as being of a temporary nature only. In coal mining, however, where the attainment of output in large degree determines the cost per ton, and delays are consequently expensive, such a repair as has been described may be the means of keeping some important piece of machinery going until a new pinion or gear can be procured. Under such circumstances even the crudest of repairs, provided they keep the mine in operation, may be fully justified.

## Cinderella Miners Build Swimming Pool

CO-OPERATION between employer and employee has rarely been better exhibited than by the Sycamore Coal Co. and its employees during the past three weeks of July. Early in July the employees of the Sycamore Coal Co., at Cinderella, asked the management for a swimming pool. They offered to furnish all labor necessary for the completion of the job if the company would furnish the necessary materials. This the man-



Dedication of Swimming Pool at Cinderella

After everyone had taken a swim the kiddies were given their fill of lemonade and ice cream and still later a picnic supper was served by the ladies to all those present.

agement agreed to do on July 8 and on July 9 actual construction started.

About seventy men and boys turned out to work on the pool, and hammers and saws were kept busy during the evenings and on idle days until the forms were completed.

On July 22 the concrete for the walls was poured and

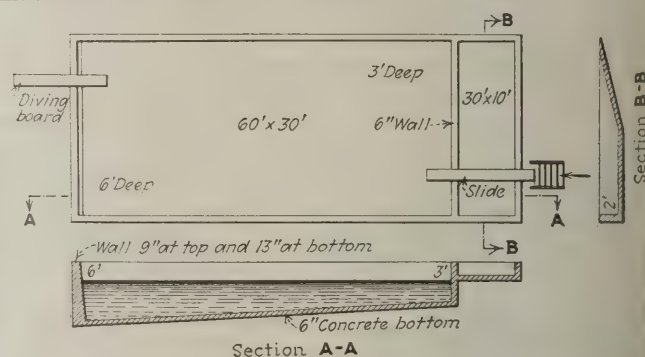
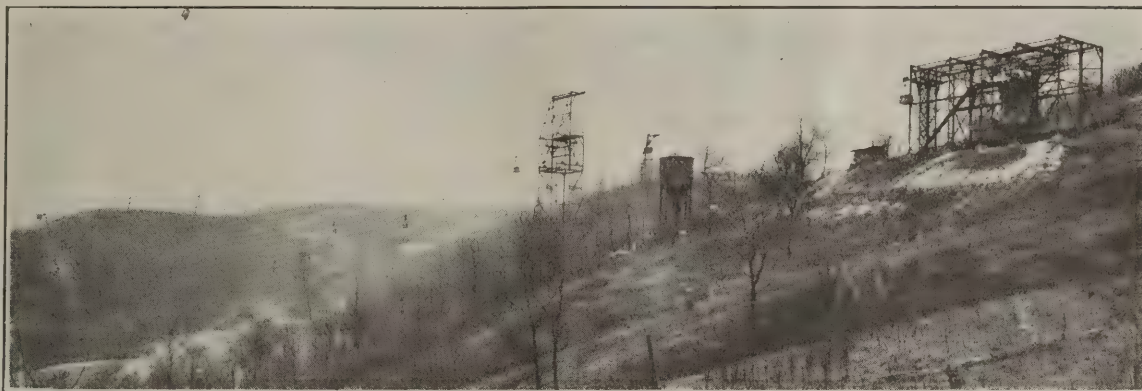


Diagram of Pool Showing Top and Slide Elevations

on the nights of July 25 and 26, the concrete for the bottom was placed, the actual construction work being finished just seventeen days after work was begun. quite an achievement when one takes into consideration that the men worked only in the evenings and on idle days.

The pool is built throughout of reinforced concrete and measures 32 x 72 ft. The main compartment is 30 x 60 ft., being 6 ft. deep at one end and gradually sloping up to 3 ft. at the other end. A novel feature of the pool is the separate compartment for the little tots. This part of the pool measures 10 x 30 ft. The deepest point in this compartment is 2 ft. and it slopes to a feather edge. This makes it possible for the little children to paddle around in the water just as well as the grown ups. The pool was formally opened on Aug. 2, before several hundred people.





Beech Bottom Slate Dump

## Aerial Tramway Solves Rock Disposal Problem

Tramway 3,200 Ft. Long—Dumping Point 200 Ft. Higher than Coal Bed—Little Power Required for Operation—Only Four Men Needed to Dispose of 400 Tons of Slate per Shift

BY ALPHONSE F. BROSKY

Assistant Editor, *Coal Age*  
Pittsburgh, Pa.

OF ALL THE operations incident to bituminous coal mining, least effort, as a rule, is expended in the attempt to effect economies in the handling and disposal of mine rock on the surface by the use of labor-saving machinery. Were operators to give more consideration to better ways and means for transporting refuse from the mine mouth or tippel to the dumping ground, and stowing it there they doubtless could save at least a few cents on every ton of coal produced. At those operations where 100 tons or more of rock is handled above ground every working day no system that does not employ labor-saving machinery should be considered.

Mine cars filled with rock can be dumped into bins in or near the tippel. From thence this refuse can be transported by electrically propelled conveyances that automatically discharge their contents at some predetermined point. There is no excuse for tramming by man or mule power along any portion of the distance between the points of loading and discharge.

Hand-shoveling and the utilization of hand-operated cranes at the dump are expensive methods of removing rock from mine cars. In short, means in use for performing this work ten to 50 years ago should not be countenanced today. Aerial tramways are well-suited to this purpose whether the ground over which they operate is hilly or level. Typical layouts of such tramways installed at coal-mine plants are shown in Figs. 1, 2 and 3.

About four years ago, when the Windsor Power House Coal Co., a subsidiary of the West Penn Power Co. and the American Gas & Electric Co., took over and rebuilt the plant known as the Beech Bottom

mine, near Wheeling, W. Va., it was faced with the problem of disposing of large quantities of mine refuse. The roof in this operation which works the Pittsburgh No. 8 bed, is unsound; consequently much of it must be taken down, close timbering is required and cleaning up falls is part of the day's work. Much of this roof rock particularly that removed from entries, must be taken to the outside. Eleven tons of slate must be hauled to the surface for every 100 tons of coal mined. As this operation produces 3,300 to 3,500 tons of coal per day, an arrangement was sought that could dispose of 300 to 400 tons of rock per shift.

### SLATE DUMP SOME DISTANCE FROM TIPPLE

The ground best-suited for use as a slate dump lies due south of the tippel, in the form of a wide valley sloping westward toward the Ohio River. The hills flanking this depression upon either side rise to an elevation of about 200 ft. above the coal bed. This topography favored the adoption of an air route to the dumping point, and accordingly an aerial tramway was selected for the disposal of mine refuse. A profile of the ground over which this line extends is shown in Fig. 1. The ground plan of the tramway also appears in this figure.

Prior to the installation of the aerial tramway, the rock was hauled in mine cars to the brink of the dumping ground and there discharged into side-dump, V-body slate cars. These were lowered by gravity to a dump in a ravine and pulled back by a hoist. This system required three shifts of five men each. The present method of slate disposal requires the services of only four men on one shift. One of these inspects the ropes and attends to their lubrication as well as that of other parts of the tramway. He also makes any minor repairs that may be needed. The other three men are employed in the loading terminal, receiv-

NOTE—In the headpiece is shown the dumping ground for the slate and rock removed from the Beech Bottom mine. The tram buckets pass around the tail terminal sheave located in the tower on the extreme right. In making this turn they are not detached from the traction rope. The tippel lies beyond the hill to the left.



ing, loading and dispatching the buckets. This saving in labor is in itself ample justification for the choice of the aerial tramway.

Aside from the labor required at the loading station, (which in reality is part of the tippie) the system is automatic. Chutes and gates under a two-car revolving dump are designed so that rock from either or

terminal. To negotiate successfully this change in horizontal direction without aid from an attendant, an angle station was built. This was arranged to give a change of 11 deg. 26 min. in a vertical plane. Because the greater angle is in a vertical direction the downward pull on the rope keeps the buckets from being derailed at this station. Rollers are set at the proper

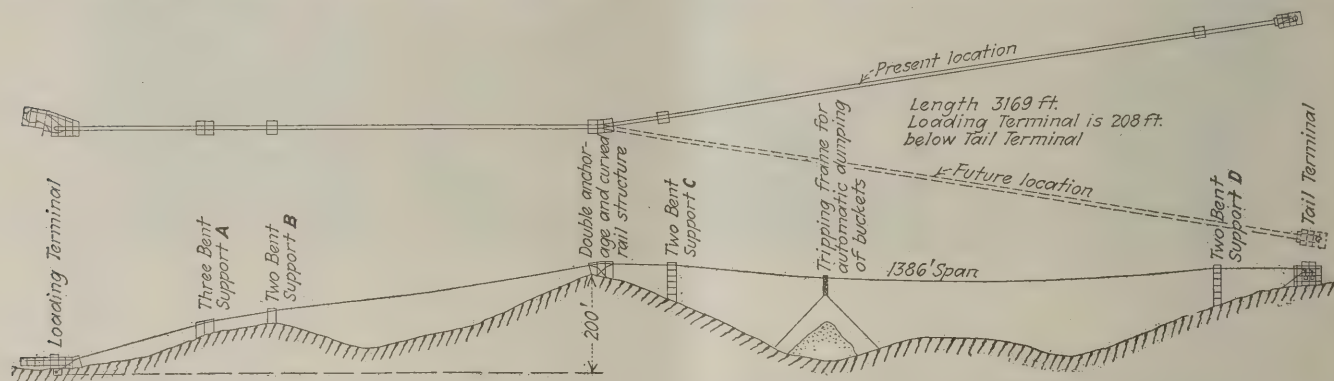


Fig. 1—Plan and Profile of the Beech Bottom Aerial Tramway Showing Present Dumping Point

Not only is the point of bucket discharge movable along the tramway, but as the valley is filled with mine refuse the course of the cableway may be changed as indicated. The capacity of such a dumping arrangement is thus large.

both cars can be bypassed into a rock bin. Adjoining this bin is the loading terminal of the aerial tramway. Buckets, running on track cable suspended from towers, are attached at intervals to an endless traction rope which pulls them from the loading terminal to the dumping point (where they are discharged automatically), thence to and around a tail terminal and back again to the loading point. This tramway is of

angle and elevation at this point to guide the traction rope around the curve in the absence of buckets. From the angle station the buckets travel out over a 1,400-ft. span of cable where the mine refuse now is being dumped.

In addition to the angle station four towers, three of two-bent and one of three-bent construction have been built, as shown in Fig. 1. The three-bent tower A is located about 400 ft. from the loading terminal whereas those consisting of two bents namely B, C and D are respectively 570, 1,600 and 3,000 ft. from the loading point. These structures are all of steel and supported on concrete piers carried down to a solid footing.

The main members of the sub-structures consist of heavy angles securely tied and braced with smaller ones. Corresponding members of the head-structures are fabricated from channels similarly braced. The beams on which the track-cable saddles rest are channels bolted to a supporting column. These uprights extend to the horizontal members of the sub-structure. Each tower is provided with a conveniently located ladder, used by the tramway crew when oiling traction-rope rollers, inspecting saddles or making repairs.

A  $\frac{5}{8}$  in., 6x7 crucible-steel wire, Lang-lay traction rope is used. The track cables are of the locked-coil type. They have a diameter of  $1\frac{3}{8}$  in. on the loaded

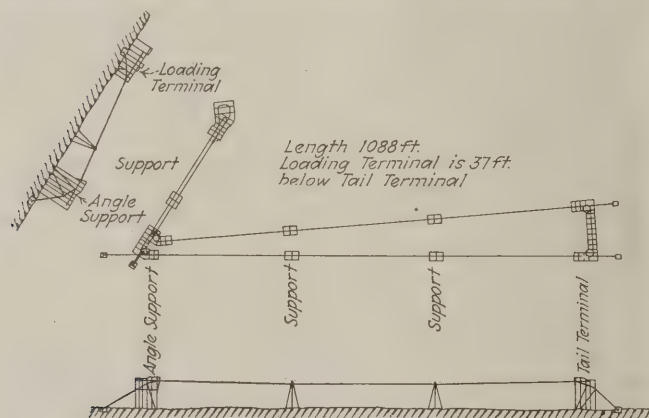


Fig. 2—Typical Level-Ground Aerial Tramway

It is easier to build up a rock bank by dropping material from buckets suspended from a cable above it than to grade up tracks from the ground level.

the Trenton-Bleichert type and was built by the American Steel & Wire Co.

This installation is designed for an ultimate capacity of 80 tons per hour. To obtain this capacity the buckets are spaced 230-ft. apart or at a time interval of  $40\frac{1}{2}$  sec. It is now, however, transporting 40 tons hourly, the intervals of time and distance between buckets being twice those given for the ultimate capacity. A 30-hp. slip-ring induction motor is required to operate the tramway at a rope speed of 340 ft. per minute when carrying 80 tons per hour. At half-capacity, however a 15-hp. motor is sufficiently large.

This tramway is 3,196 ft. long horizontally and rises 207 ft. to the tail terminal. It is unusual in that a change of 8 deg. 21 min. is made in the alignment at a point approximately 1,400 ft. from the loading

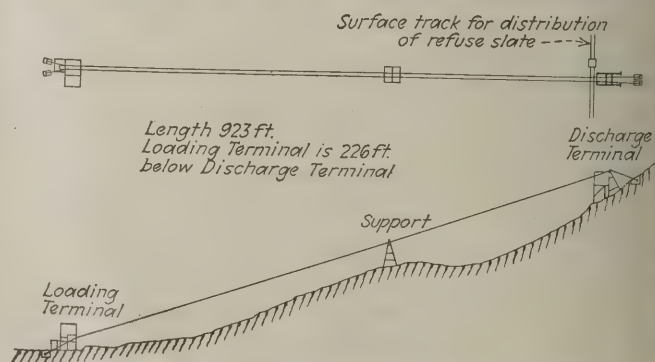


Fig. 3—Aerial Tramway Assists Electric Larry

At Jenkins, Ky., ropes and buckets are utilized to attain sufficient height on a hillside so that mine refuse may be wasted by means of an electric larry.



side and  $\frac{7}{8}$  in. on the return side. The main advantages of this type of track cable for use on tramways are: It cannot unwind and should an outside wire break it cannot project to derail a bucket; its smooth exterior surface does not groove the carriage wheels as do other types of rope; a short section can be repaired by coupling in a new piece. This is a replacement that cannot be accomplished with ordinary rope.

The track cables are suspended from the towers by means of rocking saddles, each consisting of a cast-iron base supported by a beam. Upon this base the saddle proper is set, the design being such that the saddle can rock more or less. The saddle proper is a steel casting that provides a long easy curve for the cable to rest in, accommodating itself easily to the changing angle of the rope as the load approaches or recedes from the supporting tower.

The track cables are lubricated by an oiling machine that travels on the ropes in the same fashion as the buckets. Oil in a tank under a pressure of about 35 lb. per square inch is forced through a piece of flexible steel hose to a valve located between the two carriage

At the tail terminal the traction cable passes around a 12-ft. sheave built up of structural shapes. The rim of this sheave is channeled to allow the grips on the buckets to seat themselves properly without being detached as they move around.

In order to keep the traction rope at a tension that will prevent the rope from slipping on the grip sheave, as well as to compensate readily for any stretching of the cable a movable sheave is provided. This is supported in a frame to which a block of concrete is attached by means of a heavy steel tie-rod. Under this concrete block, cribbing is placed so that the position of the sheave may be varied somewhat up or down. With this arrangement the tension on the traction rope is fixed at all times by the position of the counterweight.

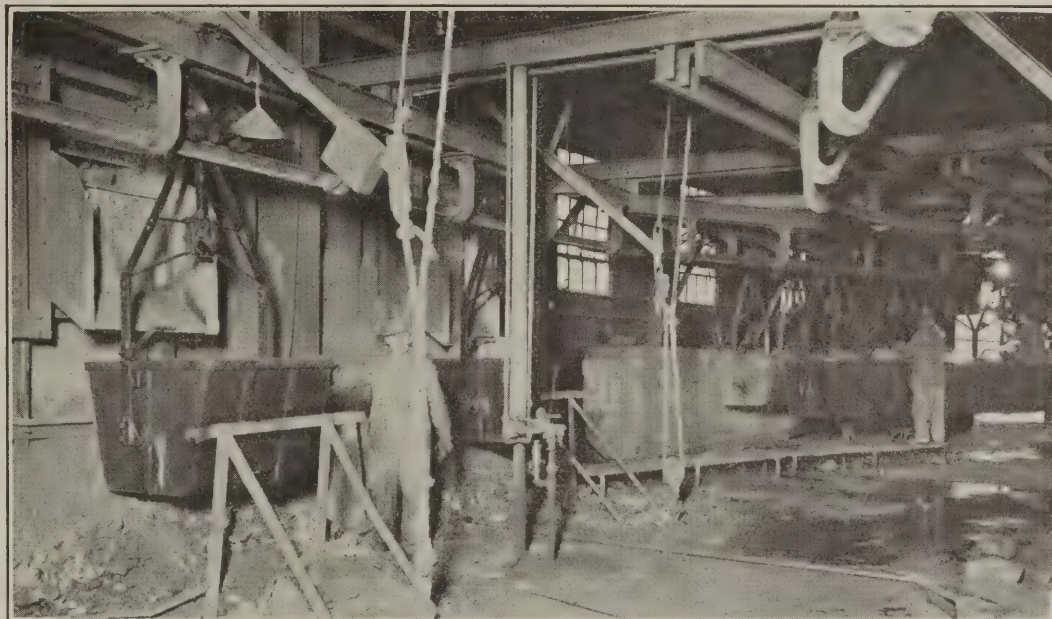
#### STATIONARY DEVICE ATTACHES BUCKET TO CABLE

Standard self-dumping 20-cu.ft. buckets are used on this tramway. The trunnions are placed below and slightly to one side of the center of gravity, causing the bucket to overturn upon release of a latch and to

FIG. 4

#### Loading Terminal

This is the only place where the buckets are detached from the traction rope. While passing through this station the buckets are pushed by hand, moving always in the same direction and traversing roughly a half circle from the ungridding to the gripping-on point. Three men can easily load and dispatch 400 tons of rock per shift. The buckets hold 20 cu.ft. of material.



wheels. As the oiler travels along the cable a knocker on the carriage wheel comes in contact with an arm which opens the valve. At each such opening a certain quantity of oil is squirted onto the track cable.

These oil ejections form practically a continuous stream when the machine moves at full rope speed, yet the flow ceases when the oiler comes to rest. The traction rope is kept well-lubricated at all times by running over a small vertical sheave that is partly immersed in a tank of oil. This sheave is located in the loading terminal.

Motion is transmitted to the traction rope by a 6-ft. drive sheave of the gripping type. This sheave is fitted with seventy-two pairs of cast-steel jaws that engage the traction rope making it impossible for it to slip. These jaws are of such shape that the rope is gripped without being damaged. The sheave is mounted on a vertical shaft fitted with suitable bearings and is driven by a train of bevel, pinion and spur gears through a countershaft and a silent chain from a motor. A 40-in. brake wheel is mounted on the pinion shaft.

remain in the capsized position until the loading terminal has been reached. Here it is righted by the crew in attendance at that point.

The hangers, on which the grips are mounted, are fabricated of flat steel. At the bottom of the hanger arms, the steel-casting trunnions are attached so that the buckets swivel or turn upon them. The carriages are equipped with steel-casting wheels fitted with bronze bushings which turn on mild-steel pins. These pins are provided with grease cups, and lock washers keep the nuts from coming off.

The grips are of a type that open on the top. They are designed to hold tightly against a horizontal pull of 1,600 to 1,800 lb. The main, or body, casting is made of iron, and the links, operating lever and movable jaw are steel castings. The movable jaw is equipped with a  $\frac{1}{8}$ -in. flat steel liner spring and a back liner of tool steel mounted in the body casting. When necessary, these liners may be replaced easily.

The traction rope grips are applied by an operator who pushes the bucket past a device known as an attacher. This is a steel casting against which the roller of an



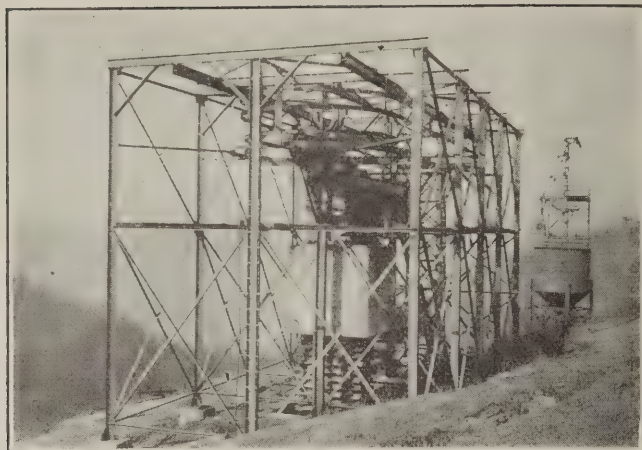


Fig. 5—Compound-Angle Station on Top of Hill

In passing this tower the direction of travel of the buckets is changed in two planes. The vertical angle is made the greater so that the traction rope cannot pull the bucket wheels off the track cable. Rollers guide the traction rope through this station.

operating lever bears. Because this casting is spirally shaped, it closes the grip by applying pressure to the operating lever that rides over it. The traction rope where it passes the attacher, being on a slope, is forced against the grip causing it to rotate in its trunnions and the rope to be seated properly before being gripped. The detacher is a somewhat similar device except that it moves the operating lever in the opposite direction, thus opening the grip.

A signal gong is provided to notify the operator when to attach the buckets in order to maintain an equal spacing on the line. This device consists of a base plate on which suitable gears, a knocker arm, cap, etc., are mounted. It is actuated from the main shaft of the grip sheave, and each sounding of the gong is the signal that a bucket is to be gripped on and sent out on the line. The buckets are discharged by a movable tripping frame mounted on the track cable. The latches that hold the buckets in an upright position are released by tripping arms and the buckets revolve on their trunnions emptying their contents into the ravine below, the buckets, of course, continuing to travel meanwhile at a uniform speed of 340 ft. per min. They pass around the 12-ft. sheave at the tail terminal and return to the loading point, where they are detached from the traction rope and pushed to the loading chutes. After being



Fig. 6—Tail Terminal and Domestic-Storage Bin

Tension on the traction rope is regulated by raising or lowering the concrete counterweight block, and inserting or removing crib timbers below it. The tramway buckets are utilized for transferring domestic coal from the tippie to the cylindrical bin in the background. This supplies the company's town nearby.

loaded they are pushed to the attacher which closes the grips and another trip is begun. From the foregoing it will be noted that the buckets are detached from the traction rope only while passing through the loading terminal.

In addition to the disposal of mine refuse, this tramway serves another purpose: it conveys coal from the tippie to a large steel-tank storage bin located near the rail terminal. From this bin coal is drawn for domestic purposes in the company's town nearby. An additional tripping frame is attached to the track cable directly over this tank.

When correctly designed and installed an aerial tramway such as has been described is desirable for transporting and dumping mine rock chiefly for the following reasons: (1) The buckets run on rope track, which is more or less flexible because it is loosely strung from tower to tower. This eliminates the obvious difficulty encountered in keeping rigid and to gage a rail track on shifting slate banks. (2) Cables can be strung in the shortest distance between two points—over level ground, uphill or downhill—whereas ground systems or track rails are applicable to easy grades only. (3) Potential dumping capacity for a single set-up is many times that of other systems.

### Parr Defines Conditions Favorable to Heating of Coal in Storage

S. W. PARR has furnished the American Chemical Society a summary of his findings on "Deterioration and Spontaneous Combustion of Coal in Storage" as a basis for the round-table discussion on that subject, Sept. 11, at the Ithaca meeting:

1. A high percentage of textural moisture in a coal indicates a high capacity for oxygen absorption. Such coals immediately upon breaking out from the seam begin to lose moisture until an equilibrium with the moisture of the atmosphere is established, thus making way for the accession of oxygen.

2. The larger the lumps of coal the slower the interchange as between the free or inherent moisture and oxygen. Conversely, the more finely divided the material the more rapid the interchange and also the greater the superficial area of the coal particles.

3. Any departure from normal temperature upward, unless checked or dissipated, is a vital factor, whether such increase of temperature arises from external sources or is the result of chemical combinations within the coal itself.

4. Accessibility of air within the coal mass, thereby augmenting the supply of oxygen beyond the quantity taken up by absorption, is essential for carrying the oxidation forward, thus bringing the temperature of the mass up to the point of ignition.

5. Accessibility of air involving ready circulation to an extent which will carry away the initial increments of heat as rapidly as formed will prevent a rise of temperature.

6. Complete prevention of an additional oxygen supply beyond that absorbed by the coal before entering the storage pile will insure against any appreciable or dangerous rise of temperature.

7. The oxidation of pyritic sulphur requires the presence of free moisture as well as oxygen. The augmenting of the heat in any manner greatly accelerates the oxidation processes for both the hydrocarbon and the sulphur components of the coal.



# Latest Improvements in Locomotive Control

Developments of New Controllers Due to Use of Larger Currents and Necessity for Power Economy—Electro-Magnetic and Electro-Pneumatic Contactors on Large Locomotives—Field Control Provided for Storage-Battery Motors

By H. H. JOHNSON\*

FOR SOME fifteen to twenty years, control equipment for standard mine locomotives underwent practically no change. It is only in the last year or two that the design of the equipment has been modified. The long period of stagnation was not the result of complete satisfaction with the systems then developed but was due rather to the fact that the use of drum controllers on early types of locomotives became a precedent from which no one was ready to depart and also to the fact that power economy during acceleration and slow-speed periods had been given little consideration.

The power losses of railway equipment during the acceleration period were given consideration early in the art of electric traction. The first steps taken were to meet the necessity of getting the motor or motors directly on the line as soon as possible. This brought into use the rheostatic control system and the controller known as the type R, which partly answered the purpose. It was soon apparent, however, that a more efficient system than the rheostatic method of acceleration was necessary if greater economy in power was to be attained. With this in view, the series-parallel controller known as the K type, was adopted after much development. This type of control first employed the open-circuit system of transition and later employed the shunting method so as to effect smoother acceleration. Later the bridging system of transition was adopted for the purpose of obtaining still further improvement.

As railway equipments increased in size a still heavier and more economical type of control soon became necessary. The desire to operate cars in trains also required a system of remote control. Both of these conditions promoted the development of the two commonly known systems of electro-pneumatic and electro-magnetic control, which now are being used widely with all sizes of motor equipment.

Throughout this evolution of the railway control systems the development of mine- and industrial-locomotive control practically remained at a standstill. There are three reasons for this: first, the increase in mine locomotive motor capacities had not increased beyond the satisfactory limits of the drum controllers; second, the class of labor in mines had not been capable of handling more refined or complicated electrical equipment; third, the type R controller had been smaller than other types having the same rugged characteristics.

The more recent increase in locomotive sizes and capacities, and the general tendency toward the lower of the two commonly used voltage systems, namely, 500 volts and 250 volts, has made it necessary to develop suitable control equipment for handling the heavier currents at these voltages. Improvements in the caliber of the electrical staffs of mining companies has permitted, to a large extent, more refinement in locomotive

control, and a study of economy and maintenance has prompted the development of better control for larger motors.

Gathering and haulage types of locomotives are now defined by a relatively sharp line of demarcation. It is in the latter class of locomotives that the large increase in size has taken place. In some instances the increase has taken the form of large single-unit locomotives but in other cases tandem and multiple operation of small units accomplishes the same purpose. The general tendency will lead ultimately to multiple operation of small units rather than to operation in tandem.

With series-and-parallel control the motors may be accelerated either in series or in parallel at the will of the operator. It is evident that, when the starting resistor is designed to start the motors in parallel, the starting tractive effort will be approximately twice

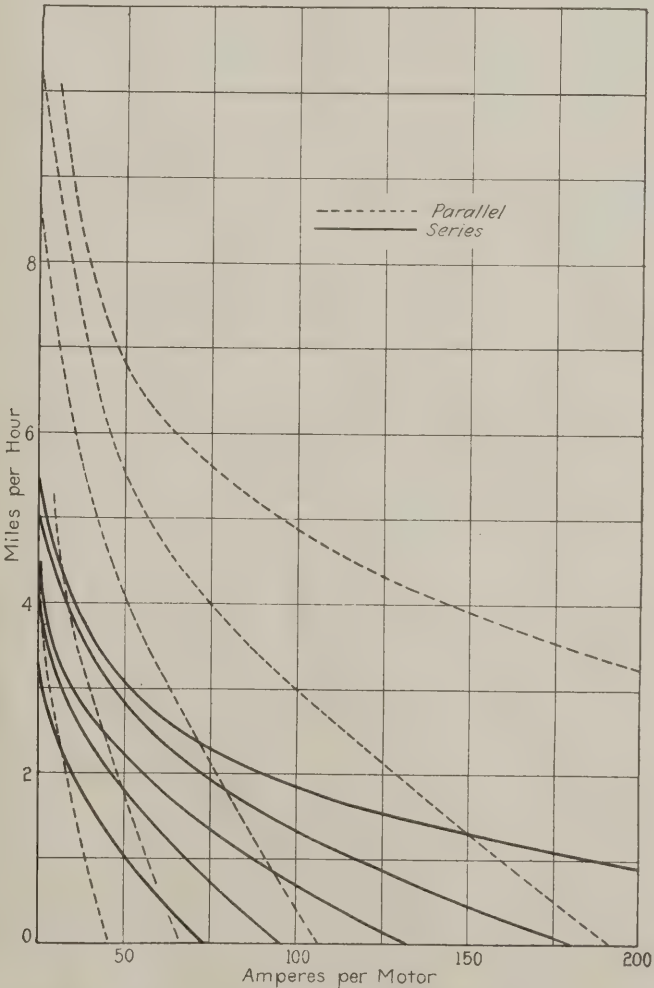


Fig. 1—Operating Curves of Series-and-Parallel Controller for Five-Ton Locomotive

This diagram shows the characteristic curves of a 5-ton locomotive equipped with two 250-volt motors when operated by a type R controller. It is the usual practice of the operator to start the locomotive with the motors connected in parallel, instead of in series; consequently, the power used when accelerating the load is excessive.

\*General Engineering Department, Westinghouse Electric and Manufacturing Co., East Pittsburgh, Pa.



as great when the connections are changed at the controller so as to start the locomotive with the motors in series.

On the other hand, if designed to start the motors in series, the number of effective notches when starting in parallel will be reduced, as unnecessary resistance must be cut out, before effective work is done by the locomotive. This condition makes it difficult to obtain satisfactory starting, with both connections when the resistor is designed to give the proper starting characteristic with either one of the two. This has practically resulted in straight rheostatic acceleration, and the operative usually leaves the connections so as to start always with the motors connected permanently in parallel. Fig. 1 shows the operating curves of the motors when connected in series and in parallel. The curves are based on the starting resistors being figured to start the motors in parallel.

In the series-parallel type of control the motors must

reduced, it becomes necessary to allow the current to drop after each notch has been taken so that the succeeding increase of current will not be sufficient to cause the wheels to slip. This reduces the average tractive effort during the acceleration period.

The application of manual control is limited to relatively small capacities, largely on account of danger to the operative and the difficulty of manually operating a large controller. Remote control is desirable for large capacities, that is, in general where the total capacity exceeds about 300 hp. at 500 volts, or 150 hp. at 250 volts.

Series and parallel controllers are obtainable, that are suited for operating two-motor equipments using two 85-hp. motors on 250-volt circuits. For four-motor equipments series-and-parallel controllers are available for four 65-hp., 250-volt motors. Four-motor controllers are usually required for tandem operation of two locomotives. For three-motor locomotive equipment, controllers are available

for capacities up to three 120-hp. motors at 500 volts or three 60-hp. motors at 250 volts.

The type K controllers are built for two- and four-motor equipments up to and including a maximum of four 110-hp. motors at 600 volts or four 45½-hp. at 250 volts. These controllers are used extensively in railway work and from the standpoint of safety it is usually considered desirable to limit their use to four-motor equipment of 50 hp. per motor at 500 volts. For larger sizes remote control is recommended.

Series-parallel connections are used with the type K controllers.

They also use the shunting method of transition from series to parallel. This type of controller has the advantage of the economy incident to the use of series-parallel control which results in more notches for the same controller capacity. Height limitations for railway applications were not of much importance, but in attempting to use this type of controller on mine locomotives height is usually a vital consideration and it is impractical in many cases to use a high controller of the K type.

Controllers designed for resistance braking or resistance and magnetic braking have been built for railway application for two- and four-motor equipments up to and including a total of 200 hp. at 500 volts. Series-parallel acceleration is provided, and the braking is secured by moving the operating handle in a counter-clockwise direction from the "off" position. This method of dynamic braking is the most desirable for mine locomotive service. Unfortunately this feature adds still further to the height of the controller and is largely the reason for not making use of the original

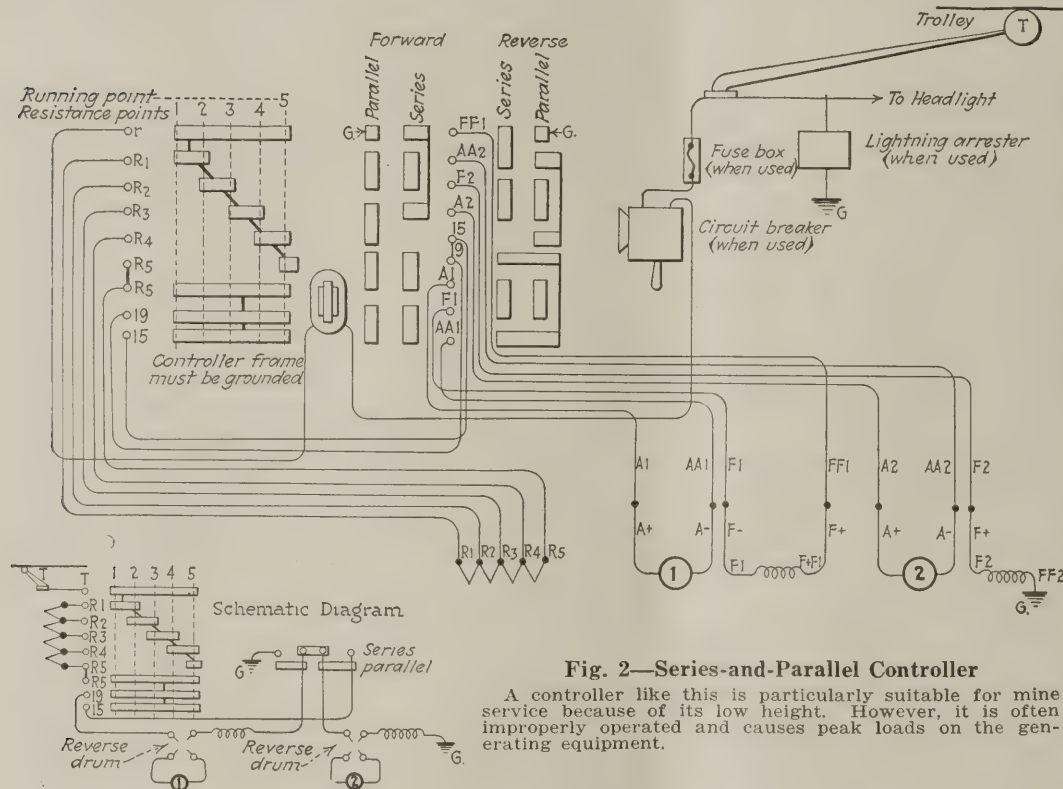


Fig. 2—Series-and-Parallel Controller

A controller like this is particularly suitable for mine service because of its low height. However, it is often improperly operated and causes peak loads on the generating equipment.

be started and accelerated in series until all resistance is out of circuit, then a portion of the resistance is re-introduced and the motors connected in parallel, after which the resistance is notched out. This results in lower power consumption during the acceleration period and allows economical running speeds below full speed.

Series-parallel control is very desirable from a standpoint of efficiency but it has not been widely used in mine-locomotive applications chiefly because of the increase in the controller height. A series-parallel controller of the same rated capacity as a series-and-parallel controller has more notches. The number of notches available on the controller affects the maximum weight of train which a locomotive can pull.

Maximum tractive effort is determined by the slipping of the wheels. If the controller has an infinite number of notches, the accelerating current may be kept so that the variation from the maximum tractive effort is infinitely small when notching from one point to another. If the number of notches on a controller is



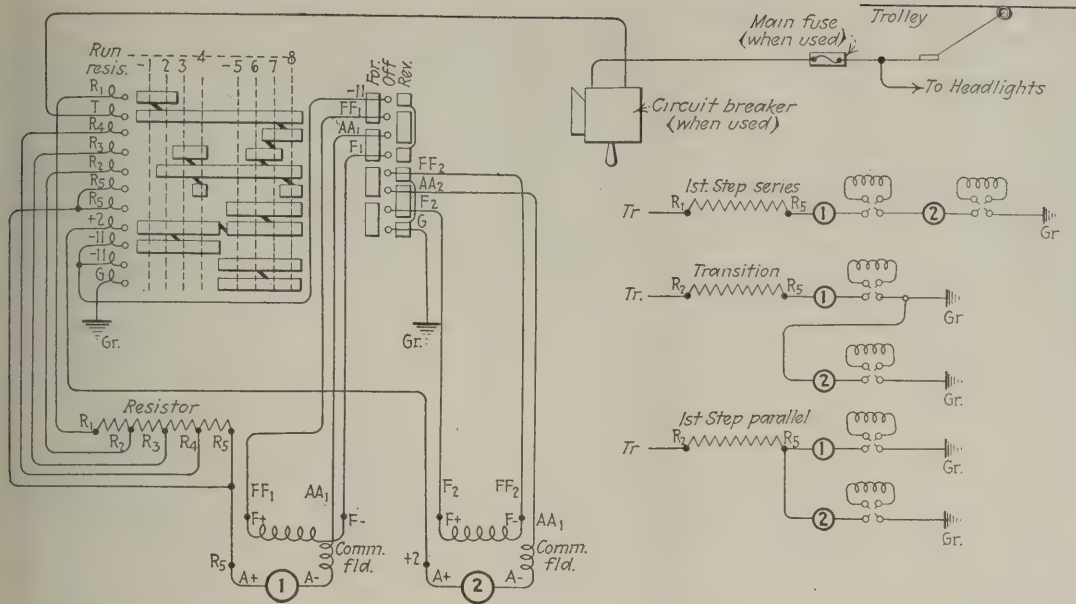


Fig. 3  
Later Type Unit

The series-parallel controller gives better acceleration of the locomotive and train. The operative must start with the motors in series and pass over each consecutive notch until the motors are finally in parallel across the line. This saves power when the locomotive is being accelerated or is running at less than the speed for which it is designed.

features of the braking type of controller developed for street and interurban traction service.

Fig. 3 illustrates connections for a controller developed for, and in use on, storage-battery locomotives. When selecting controllers for storage-battery locomotive service it is of great importance to take into account battery economy. As many of the speed-control points as possible should be obtained without the resistance of the starting rheostat being in the circuit. The use of field control is of great economic value and permits greater speed variation which less battery consumption.

Line switches have been used effectively in conjunction with drum-type controllers to relieve the drum contacts and fingers of arcs when breaking the main circuits and returning the controllers to the "off" position. The line switch, when used in this manner, may also be made to provide for overload protection, used in conjunction with an overload relay. Line switches have been used extensively with street-railway equipment but not much on mine locomotives. Line switches are either made up of contactors which are of the electro-pneumatically operated type or the straight magnetic-

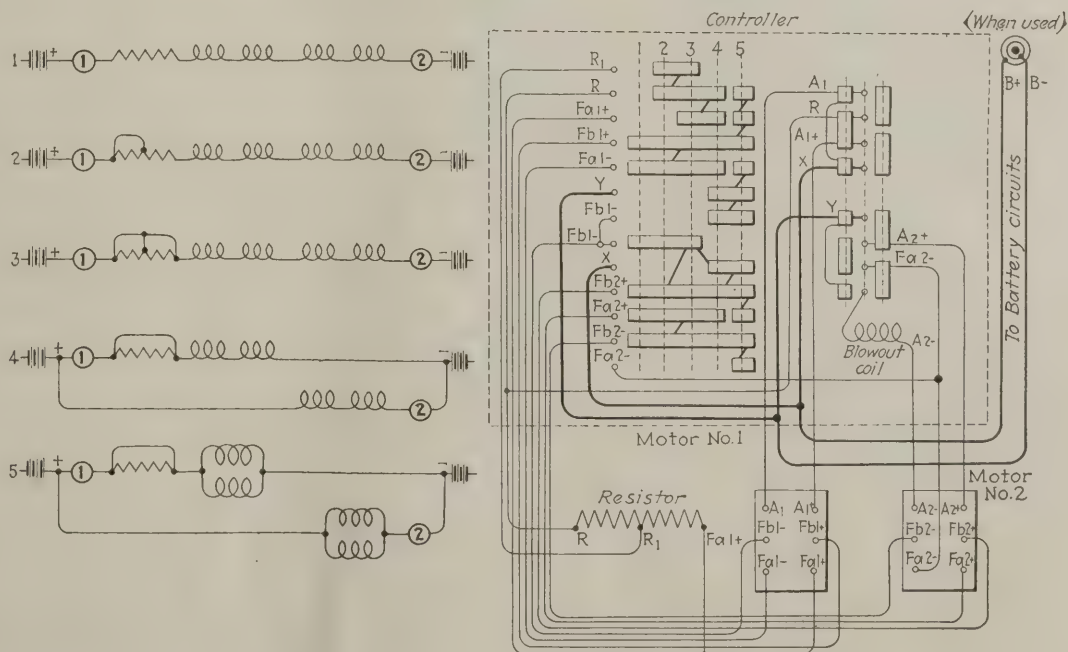
contactor type, usually depending upon the service.

The electro-pneumatic unit switch differs from the energizing a solenoid from the control circuit. One of the main circuit contacts is carried on an extension of the armature, and as the armature is drawn upward by the solenoid it completes the main circuit through a stationary contact. When the solenoid is de-energized the armature drops by gravity. A magnetic blowout is provided for extinguishing the arc. The whole switch mechanism is mounted on a base and placed in a sheet-steel box.

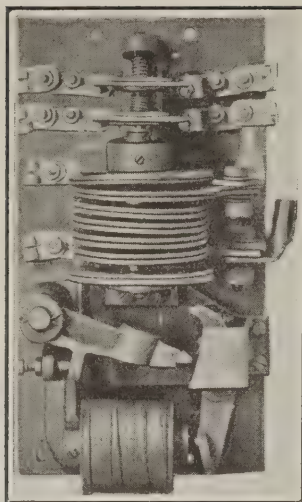
The electro-magnetic type of contactor is closed by magnetic contactor in the means employed for operating the switch contacts. High-pressure compressed air is admitted to a cylinder, the piston of which is attached to the moving contact arm. This piston moves against the action of a powerful spring. When the air is released from the cylinder, the spring forces the switch jaws apart with a force of over 100 lb. and an effective magnetic blowout extinguishes the arc. The circuit is quickly broken because the switch contacts open at high speeds.

FIG. 4  
Storage-Battery Controller

Every possible means for obtaining the maximum of useful work from the storage battery should be incorporated in the controller used on a battery locomotive. By means of field control many resistance points are eliminated, and it is possible to vary the speed widely without undue draught on the power of the battery. Economy in power increases the length of time that the battery can be run, thus adding increased convenience to economical operation.







#### Improved Type Overload Relay

Such a device for use on a mine locomotive should be rugged and positive in operation. Locomotives of large size should invariably be provided with some means of preventing the controller fingers from seriously burning.

One hundred pound pressure at the contact surface insures positive action of the switch. Air is admitted to, or released from, the cylinder through a valve operated by a small solenoid. The whole switch mechanism is mounted on, and insulated from, a cast-iron framework and enclosed in a sheet-steel cabinet. The chief advantages for mining applications are powerful and positive action of switch movements; effective blowout; contact pressures independent of line-voltage fluctuations; low maintenance; and rugged construction.

With the recent increase in demands made on mine locomotives, drum control has been taxed to the limit and a more satisfactory means of governing the larger motor equipment was necessary. This has been the cause of the introduction of remote control for units of large capacity. Many satisfactory applications have been made and both magnetically-operated contactors and electro-pneumatically operated contactors have been used. Included among the many advantages of remote control the following are outstanding: 1. Greater motor capacity may be handled. 2. Maintenance cost may be reduced. 3. Controller manipulation is made

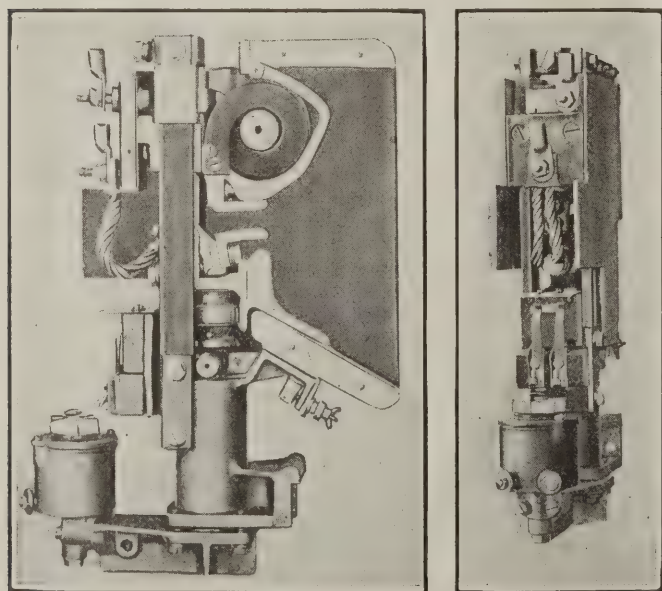


Fig. 6—Section and Rear View of Electro-Pneumatically Operated Contactor

The high currents necessary with locomotives of large capacity make it impossible to develop a practical manually operated controller. This contactor operates from a small control circuit. All heavy currents are broken between large contacts provided with arcing chutes and blowouts.

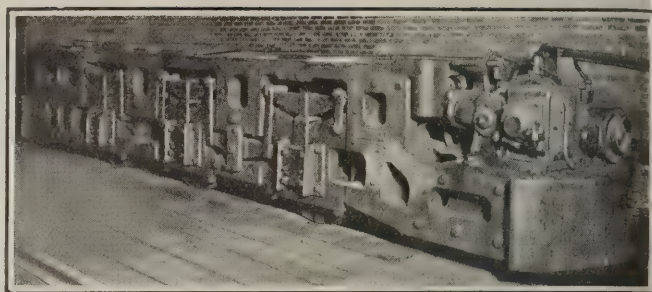


Fig. 7—A 35-Ton, 250-Volt Single-Unit Mine Locomotive

Each of the three axes is driven by a large motor. The control consists of electro-pneumatic contactors which are also used to provide dynamic braking. Mechanical braking is obtained by air brakes.

easier. 4. Danger to operative is reduced. 5. Multiple operation of two or more locomotives is made possible with slight addition of equipment. 6. Minimum headroom is required and 7. Overload protection is increased by the opening of the switches.

### British Government Will Study Coke, Benzol and Gas Manufacture

The government of Great Britain, at the instance of the Secretary for Mines and the Department of Scientific and Industrial Research, according to advices received by the Bankers Trust Co. of New York from its English Information Service, has decided to provide at once for the rapid development of a chemical and physical survey of the coal seams of Great Britain, to determine the possibility of replacing some 140 million tons of raw coal at present burned every year in its natural state by other and smokeless fuels obtainable from coal by carbonization and gasification.

It is pointed out in this connection that if coal could be carbonized on a large scale in such a way as to yield a supply of fuel oil for the navy and mercantile marine, and an important share of motor spirit for use in motor cars and aircraft, the balance of foreign trade would be altered in favor of Great Britain. The abatement of the smoke nuisance in towns and manufacturing districts owing to the abandonment of raw coal as a fuel would have immediate and far-reaching effects upon the health and housing of the people.

**SULPHUR IMPORTANT SOURCE OF HEAT IN SPONTANEOUS COMBUSTION.**—S. W. Parr and E. R. Hilgard will say in the paper they will deliver at Ithaca, Sept. 11, before the American Chemical Society, that finely divided pyritic sulphur which may be even in microscopic sizes is more common in coal than has been supposed. A high percentage of sulphur is often associated with mother of coal and in Illinois sulphur in marcasite form is quite as abundant as in the pyritic form. As the oxidation of so small a quantity of sulphur as 0.5 per cent may raise the temperature of the mass 71 deg. it is evident that further attention should be given to sulphur and the rôle it may play in the starting of spontaneous combustion in stored coal.

In 1831 "John Samuel Dawes of Bromford, in the Parish of West Bromwich in the County of Stafford, Ironmaster," was granted a patent, No. 6,207, on the use of pulverized charcoal or any other fuel applicable to the purpose. The specification shows the fuel was to be used in the blast furnace.





## News Of the Industry



### New Temple Anthracite Coal Co. Formed By Merger of Two Independents

Temple and East Bear Ridge Companies Consolidated—Organization Controls Seven Collieries and 40,000,000 Tons of Mineable Coal—Sproul Reticent on Plans

Special to *Coal Age*

Scranton, Pa., Sept. 9.—One of two anthracite company mergers reported in the progress of formation for some time past was effected over the week-end. The Temple Coal Co., of Scranton, and the East Bear Ridge Co., also with offices in Scranton, have consolidated, forming the new Temple Anthracite Coal Co.

For weeks rumors of combinations involving independent operations in the anthracite belt have been discussed in financial circles. Definite information was lacking until last Friday, when authoritative announcement was made. John H. Brooks & Co., of Scranton, members of the New York Stock Exchange, handled the merger.

The new Temple Anthracite Coal Co., through ownership of stocks of subsidiary companies and leases, will now control and operate the following seven hard-coal collieries: Northwest colliery, near Carbondale, with approximately 560 acres of coal land and a breaker having a capacity of 1,000 tons per day; the Lackawanna colliery, about six miles north of Scranton, with 1,080 acres of coal land and a breaker of 1,200 tons capacity; the Sterrick Creek colliery, near Scranton, with 748 acres of coal land and a breaker of 2,000 tons capacity per day; the Mount Lookout colliery, about 10 miles south of Scranton, with 632 acres of coal land and a breaker of 1,500 tons capacity; the Harry E. and the Forty Fort collieries, about 14 miles south of Scranton, with 1,074 acres of coal land and a breaker of 1,000 tons capacity per day, and the East Bear Ridge colliery, at Frackville, with 266 acres of coal land and a breaker having 1,200 tons capacity.

The estimated recoverable coal in these properties is in excess of 40,000,000 tons. Assets of the new company will consist of other mineable coal in various perpetual leaseholds, which at a conservative equity of 20c. a ton for coal in the ground has a value of over \$8,000,000; seven modern breakers with machinery and equipment, all necessary buildings for operation of the plants, eighty-three dwellings, fourteen barns, 3,343 mine cars, 267 mules, 8 horses, 39 electric and 14 steam locomotives, all of which are estimated to have a value in excess of \$4,000,000.

The officers and directors of the new Temple Anthracite Coal Co. are: Chairman of the Board, Thomas R. Brooks, Scranton; President, F. H. Hemelright, Scranton; Vice-President, Seward Button, Wyoming; Secretary and Treasurer, A. M. Bingham, Scranton; Directors, Thomas R. Brooks, F. H. Hemelright, George R. Brooks, G. T. Davis, all of Scranton; S. B. Thorne and B. A. Thompson, both of New York, and James B. Neale, of Pottsville.

Scranton, Pa., Sept. 9.—Former Governor W. C. Sproul, stopping in this city en route to Pike County, would not discuss details in connection with the reported merger of independent anthracite coal companies which he is said to be directing. He admitted that he was interested in the consolidation of a few of the independents in the hard-coal field, expressing the opinion that "the time is ripe for such a move." Details of the proposition, he stated, are under consideration.

### Take Action to Boost Output In Central Pennsylvania

In an effort to put the central Pennsylvania bituminous-coal field in its former high place as a producer of coal, the Association of Bituminous Coal Operators of Central Pennsylvania and the Central Pennsylvania Coal Producers' Association, meeting jointly in Altoona, Pa., on Friday, Sept. 5, adopted a resolution instructing the board of directors and the executive committee of the association "to take such steps as they deem necessary and to perform such acts as may be requisite to restore the central Pennsylvania district to its proper place as a producer of coal."

The members of the associations pledged themselves to support any steps taken in pursuance of the object of this resolution.

Officers of both associations were elected, one group acting for both, as follows: President, B. M. Clark, Indiana; Vice-President, G. Webb Shillingford, Clearfield; Secretary-Treasurer, Charles O'Neill, Altoona; Statistician, W. A. Jones, Altoona; General Counsel, A. M. Liveright,

### Three Railroads Place Big Equipment Orders

The Philadelphia & Reading R.R. is about to purchase 1,000 fifty-ton box cars and 1,000 seventy-ton gondolas, according to an announcement from Philadelphia Sept. 4. This follows closely an announcement by the Pennsylvania R.R. that it had placed an order for 10,000 all-steel box cars.

Details of the cost were withheld, but the steel trade estimates the value of the contract at \$20,000,000. According to an official announcement, the business went to the American Car & Foundry Co., the Standard Steel Car Co., the Pressed Steel Car Co. and the Bethlehem Steel Co.

W. J. Harahan, president of the Chesapeake & Ohio, has announced the closing of a contract with the Richmond (Va.) Car Works, Inc., for equipping 1,000 70-ton hopper-bottom gondola cars with new bodies. The railroad company also has placed with the Inland Steel Co. and the Illinois Steel Co. contracts for 5,000 tons each of steel rails.

Clearfield; Labor Commissioner, John C. Forsyth, Clearfield.

The Central Pennsylvania Bituminous Operators' executive committee includes B. M. Clark, Indiana; Rembrandt Peale, New York and St. Benedict, Pa.; J. R. Caseley, DuBois; S. J. Wills, DuBois; C. B. Maxwell, Morrisdale; H. B. Scott, Philipsburg; Thomas F. Kelly, Coalport; J. William Wetter, Philipsburg; G. Webb Shillingford, Clearfield; Edgar W. Tait, Pittsburgh; William Lamont, Elmora; I. A. Boucher, Beaverdale; Harry Boulton, Philadelphia; S. T. Brown, Indiana, and N. J. Bracken, Johnstown.

Following is the board of directors of the Central Pennsylvania Coal Producers' Association: J. William Wetter, Philipsburg; R. H. Sommerville, Winburne; M. J. Bracken, Johnstown; H. J. Meehan, Johnstown; James H. Allport, Barnesboro; S. J. Wills, DuBois; Edgar W. Tait, Pittsburgh; W. R. Craig, St. Marys; G. Dawson Coleman, Philadelphia; D. T. Price, Windber; Charles A. Owen, Johnstown; Rembrandt Peale, New York; B. M. Clark, Indiana; J. R. Caseley, DuBois; James B. Neale, Minersville; G. Webb Shillingford, Clearfield; W. S. Blaisdell, Punxsutawney; F. B. Kerr, Clearfield; C. B. Maxwell, Morrisdale; Harry Boulton, Philadelphia, and S. T. Brown, Indiana.



## Sir Samuel Kelly Opens Mine In North of Ireland

At Coalisland, County Tyrone, a new mine, says *The Engineer* of London, England, has been opened by a native of Belfast, Sir Samuel Kelly, an owner of mines in Cumberland and of a coasting fleet in the British Isles. The mines are forty-four miles from Belfast, with which they are connected by rail and canal. The coal was struck at 433 ft., previous explorations not having been extended further than 300 ft. It is said that the coal is an excellent bituminous equal to the best Scotch. The shafts are 1,070 ft. deep, 12 ft. in diameter and 62 ft. apart. The seams exposed are 12 in number.

### Seams at Newtownkelly

Depth in Ft.	Name of Seam	Thick- ness Ft. In.	Depth in Ft.	Name of Seam	Thick- ness Ft. In.
433	Kelly	4 9	761	Beltiboy	2 0
476	Crow	4 6	775	Monkey	0 9
542	Annagher	9 6	806	Two-Foot	6
570	Bone	6 3	898	Rock Coal	0 9
625	Shining	2 6	950	Ten-Inch	1 0
691	Bracksville	4 6	986	Ferry Five Foot	2 3

The shafts are fitted with double-decked cages each holding two cars capable of carrying 1,176 lb. apiece. The cages are kept in a vertical plane by six steel-wire guide ropes suspended from the headgear (headframe) and weighted at the bottom by 4½-ton cast-iron "cheeses" (circular weights). Probably 200,000,000 tons of coal are located in the coal basin contiguous. About 200 Scotch miners are at work at present. A town, Newtownkelly, has been erected, 100 houses are already built and 300 more will be added shortly. Each has parlor, kitchenette, scullery, three bedrooms, bath and wash boiler. The rent is 7s. 6d. (\$1.82) weekly. Belfast requires about 1½ million tons and now imports it from across the Irish Sea.

## May Reorganize Addy Co.

The Matthew Addy Co., of Cincinnati, one of the oldest pig iron, coal and coke concerns in the United States, will be reorganized in the event that a proposition submitted to its creditors Aug. 20 is accepted. It is proposed to supplant the Addy company and its branches with a new company, according to the suggestion of Benjamin N. Ford, William W. Hearne and A. Burt Champion, all vice-presidents of the company.

It is proposed to put \$250,000 into the new company, of which \$125,000 will go immediately to pay off some of the creditors' claims. The proposition stipulates that the creditors with claims under \$1,000 be paid in full and the remainder of the \$125,000 prorated among the larger creditors. In addition, the proposal specifies that the new company shall pay off the remainder of the debts at the rate of 1 per cent a month. These payments shall come out of the earnings of the company after it has been functioning six months.

About thirty creditors were represented. Following submission of the proposal the meeting adjourned until Sept. 10, when the creditors will meet again to take final action.



John C. Maben

Former president and one of the organizers of the Sloss-Sheffield Steel & Iron Co., died at Atlantic City, N. J., Sept. 1, at the age of 85. Besides taking an active part in organizing the Sloss Iron & Steel Co. in 1887, and its successor, the Sloss-Sheffield Steel & Iron Co., in 1899, he was one of the organizers and directors of the Richmond-West Point Railway & Warehouse Co., now part of the Southern Ry.

## Will Manufacture Fuel By Trent Process

A. B. Lansberry, operating a large bituminous mine at Clearfield, Pa., is constructing a SuperFuel plant which will use the Trent process and have a capacity of 500 tons per day. The plant will be used to convert his slack pile into SuperFuel as well as to operate on run of mine coal. Mr. Lansberry's plant is the first SuperFuel plant built in the Clearfield district.

Since the present coal depression began Mr. Lansberry has continued to operate his mine and has stored a large quantity of slack for which he has found no market.

M. J. McQuaide, president of the Ben Franklin Coal Co. of West Virginia, announces that the SuperFuel plant which the Pittsburgh Trent Corporation is constructing for him at his Panama mine at Moundsville, W. Va., will be in operation about Nov. 1, 1924. The Panama mine has long been one of the large operations in the Moundsville district, but has practically suspended operations during the present coal depression.

The company which will operate the SuperFuel plant at Moundsville is known as the West Virginia SuperFuel Co., with offices in the Park Building, Pittsburgh, Pa. M. J. McQuaide is president and R. J. Balph is secretary.

Arrangements have been made to market the SuperFuel in Pittsburgh through the purchase of a river frontage for storage, from which the SuperFuel will be distributed to consumers in Pittsburgh. Arrangements also have been made for storage in Cincinnati. The McQuaide interests have been operating a line of steamers and barges on the Ohio for some time and the product will be largely delivered by water.

## Coal Shortage Unlikely Next Winter, Says Report Of Engineers' Committee

Unless there be a strike or suspension at the mines, there should be no coal shortage next winter, the report of the American Engineering Council's coal storage committee has announced as a result of an investigation carried on by 400 engineers in all parts of the country. The report was made public at the council headquarters, 29 West Thirty-ninth Street, New York City, by ex-Governor James Hartness of Vermont, president of the body.

While no shortage is anticipated, the "gorge or diet" tendencies of consumers, coupled with an extremely irregular market, are producing "feast or famine" conditions in the coal industry, the report continues. Runaway prices are said to be caused by the frantic bidding of purchasers against each other, to which some of the operators "are quite willing accessories."

The report insists that, through storage of coal, huge wastes, running into the millions each year, could be averted. There are about 90,000 carload-lot buyers, and to these storage of large quantities of coal is limited. The report adds that:

"The retailer supplies practically all the millions of householders with both anthracite and bituminous coal. He also handles some 30,000,000 tons of bituminous coal for industrial use and for small public utilities. Much of this is dependent on day-to-day deliveries from the yard. The aggregate storage capacity of the bunkers and bins of these small consumers is not known, though it probably runs into millions of tons.

"Storage of a winter's supply by these consumers may, indeed, be impossible, but it does not follow that larger bunker capacity would not be so desirable. If the economic incentive to storage is sufficient, even these small consumers will find means to increase their fuel reserve."

The committee found that, in addition to the retailers, there were about 52,000 consumers throughout the country who bought in carload lots, principally railroads, public utilities and large factories. In such cases the problem of storage becomes an important one, calling for construction of mammoth plants for that purpose. It is one that should be solved, the report urges, if the coal supply is to be stabilized.

After having spent three weeks in Belgium, northern France and in Paris, A. C. Fieldner, chemical engineer, in charge of the Pittsburgh station of the Bureau of Mines, will continue his investigations, with the following schedule: Sept. 7-14, Geneva, Berne and Zurich; Sept. 15-20, Mannheim and Frankfurt; Sept. 21-Oct. 6, Essen, Cologne, Dortmund, Düsseldorf and Geluenkirchen; Oct. 7-14, Berlin; Oct. 15-24, Halle, Dresden, Leipzig, Altenberge; Oct. 25-30, other points in Germany and several points in Holland; Nov. 1-14, Great Britain. Mr. Fieldner will sail for home on Nov. 15.



# British Mining Discloses Methods That May Soon Be Seen in America

Time Near When Thinner and Deeper Seams Must Be Worked Here—  
Difficult Workings, Labor Relations and Safety Ably Handled  
by British—Stone Dusting Universal

BY PAUL WOOTON  
Washington Correspondent of *Coal Age*

Called to Great Britain by the Power Conference many Americans interested in coal took advantage of their presence in the British Isles to acquire some first-hand knowledge of the conduct of the coal industry there. Most of these observers were men in whom the American weakness of bragging is not pronounced. They looked over the British coal fields with the thought of learning something from their practice which could be applied profitably here. Some of the showy things like bigness, newness or pretentious external appearance of plants in this country cause some Americans to think that we have incorporated in our practice all that is worth while in the production of coal. The observers, however, who are now returning from overseas are not of that type. They attach significance to many of the things they saw. They realize, among other things, that there is an explanation of the fact that the American miner produces nearly four times as much coal per day as does the British miner. Our good fortune in having deposits of rich coal laid down in thick seams accounts in part for this and certain other comparisons which are not as adverse as they seem.

American coal operators, for instance, will find much of profit, some of these observers declare, in a study of the design of British mine workings. They have exhausted the thick and easily accessible seams. They now are forced to grapple with increased physical difficulties. They are winning coal with a profit from 30-in. seams, 24-in. seams, 20-in. seams, and even from seams of less thickness. They are digging coal through shafts that are 3,000 ft. deep. Some operations are carried on under 4,000 ft. of cover. They are working beds of coal which lie between other beds which long since have been removed. They are contending with bad roof and with bad floor and are removing coal that already was badly broken and fractured in its place. Despite these facts, they get an extraction of 90 per cent with a loss of life that is one-half the rate in this country. They operate successfully in mines so gaseous that no powder or electricity may be introduced.

Every coal mine in England now is making stone dusting a regular practice. The cost of dusting has been reduced to the point where it is less than a penny per ton. In one of the mines visited by the Americans, in South Yorkshire, there has been no fatal accident in five years. The property is over 3,000 ft. deep and employs 2,700 men. It is typical of many others. The Americans were amazed at the low

point to which mortality has been reduced. The methods employed in safeguarding workmen are not all directly applicable to the natural and competitive conditions which exist in this country, but their success in promoting safety is regarded as of the greatest significance and deserving of close study by American engineers.

The point is being reached in several of our coal fields where resort must be had to thinner and deeper seams. The development of such properties must be planned at this time along lines that will permit the future recovery of the remaining resources of the property. Many even now could profit from a study of the British practice in mining a series of beds which lie one above the other, so as to obtain the maximum coal at a minimum cost. Much was observed at British mines that would be of particular moment in the operation of certain properties in the Pittsburgh, Pocahontas, eastern Kentucky and Illinois districts.

In the matter of labor relationships the consensus of opinion is that we have much to learn. In certain respects wage disputes and other conditions of employment are handled much more effectively there than here. In Durham and Northumberland particularly the Americans were impressed with the friendly and businesslike methods employed and the wholesome respect the representatives of each group seemed to have for the other. Day-to-day adjustments were being handled with complete absence of friction. The Americans were much interested in their method of evening up the differences occasioned by a bad working place. Every three months in each mine the men draw lots for the working places and shift about so that those who have been working under difficulties have a chance to get a better place during the next quarter. This system, which is known as "caveling," may not be applicable elsewhere, but it is indicative that the inequality of opportunity in working places is recognized.

In Northumberland they seem to have worked out a means of readjusting the piece rate in different seams and in different mines without changing the general level of rates. If the miners in a given mine can show that they are making 5 per cent less than the "county average" they have an argument for an increase which may be taken up before the joint conference. In similar fashion, if the operator believes rates in his mine are out of line with rates in other mines and if he can show that the average earnings elsewhere are 5 per cent higher than his earnings, he has shown cause for the consideration of a reduction and can bring his case before the joint confer-

## Governor Nestos Urges Coal Buying Now

Governor Nestos, of North Dakota, in a recent statement, urged citizens of the state to lay in a coal supply to assist in the rapid movement of North Dakota crops to market, by lightening the burden on the carriers.

"I have been just advised by the Northwest Regional Advisory Board that they have adopted a resolution urging all users of fuel, and especially the institutions that use a great deal of it, to lay in a stock now so as to relieve the railroads in the time of the peak movement of grain and other crops," said the Governor.

"While I realize that the users of lignite coal cannot lay in their supply for the whole year, nevertheless it would be wisdom to lay in supplies, both of lignite and in cases where the other coal is used, of that coal sufficient to last until the beginning of the new year so that in late September, October and November our freight cars may be free to carry our splendid crops to market."

ence. Under this system of bargaining the great inequalities of earnings, such as occur in our anthracite region, are eliminated.

## Union Sued for \$100,000 When Woman Is Fired

Eight labor union locals and over a score of individuals, mostly officers of unions at Hurst and other portions of Williamson County, Illinois, are defendants in a suit for \$100,000 damages filed in the U. S. District Court, at Danville, by Isabel Russell, of Cape Girardeau, Mo.

She alleges she lost her position as manager of the Herrin Supply Co. because she had been blacklisted by the unions and a demand was made on her employers for her dismissal. Mrs. Russell asserts that she was unable to obtain other employment as a result of the blacklist, and was forced to go to another state. The complainant's husband, T. P. Russell, was foreman of the mine-riot grand jury, which returned the indictments in the killings of the non-union miners in the mine-riot cases at Herrin.

## Anthracite Circular Prices For September, 1924

(Gross Ton, F.O.B. Mines)

	Broken	Egg	Stove	Nut	Pc&
Lehigh & Wilkes-Barre.....	\$8.00	\$8.75	\$8.75	\$8.75	\$5.75
Pattison & Bowns.....	8.90	8.90	9.15	8.90	5.50
Phila. & Reading.....	9.15	9.15	9.40	9.15	6.00
Lehigh Valley.....	8.50	8.75	9.05	9.05	5.75
Lackawanna.....	8.00	8.75	8.75	8.75	5.75
Lehigh Coal & Nav.....	9.25	9.25	9.50	9.25	6.00
Del. & Hudson.....	9.00	9.00	9.00	9.00	6.00
Thorne, Neale & Co. (Temple Coal Co.).....	9.20	9.55	9.20	5.75	
M. A. Hanna & Co. ....	8.80	9.15	9.65	9.25	5.75

Prices for steam sizes, as quoted by companies are as follows: Buckwheat No. 1, \$3 @ \$3.15; rice \$2 @ \$2.25; barley, \$1.50; birdseye, \$1.60.



## Further Losses in Union Field Unless Wages Are Equalized, Says O'Neill

"The operators of central Pennsylvania have not at any time asked the United Mine Workers to take a permanent flat wage reduction," said Charles O'Neill, secretary of the Central Pennsylvania Coal Producers Association, in reply to John Brophy's comment on Mr. O'Neill's statement following the meeting of the operators at Altoona, Pa., Aug. 22. "They have pointed out to the United Mine Workers that the way to have central Pennsylvania return to a permanently prosperous basis is by giving it a chance to compete for the markets of the country during the period of liquidation, this being the time Mr. Brophy and other pseudo-economists tell us that the industry will be purged of 200,000 too many men and several thousand excess mines eliminated."

"In order to avoid having all the miners eliminated from the union mines and all the mines abandoned being union mines, the miners will have to make some sacrifices. If it is to be a competitive war between two sections of the industry, all parties in the unionized section of the industry will have to be willing to help make the fight. By courageous leadership this can be accomplished without surrender of one right, equity or price the miners enjoy under the so-called Jacksonville agreement."

### O'Neill Presents Some Facts

Labelled as "facts" the following arguments are advanced in order by Mr. O'Neill:

"(a) Over 200,000,000 tons of the coal accessible to the Eastern markets and competitive with our coal are being produced from 50c. to \$1 per ton lower cost than coal can be produced in our district under the union wage scale.

"(b) The present wage agreement with the United Mine Workers, which fixes our cost, will not expire until April 1, 1927.

"(c) The decline in production of coal in central Pennsylvania will be more rapid under the present differential in labor cost of 50c. to \$1 than it was before the Great War, when the differential in labor cost of coal in the union fields as compared with the non-union fields was but from 10 to 20c. per ton.

"(d) The present policy means that the 200,000 men who must leave the industry will be union miners and the excess mines eliminated will be union mines.

"(e) In 1924 to date the non-union fields of West Virginia have increased their production 11 per cent over the same time in 1923. In this period central Pennsylvania has lost 27 per cent in production.

"(f) The figures quoted by me were correct in every instance. The lame attempt to label unpleasant truths 'Wage-adjustment propaganda' does not change the facts. Facts are stubborn things.

"(g) If the 'prosperity' which we are assured by the miners is almost here, does arrive it will no doubt result

## "Coal Barons" Have No Primrose Path

In analyzing the statistics of income for 1921 compiled by the Bureau of Internal Revenue the National City Bank, among other things, says:

"We have heard much in recent years about the 'coal barons,' and their ability to fix prices to suit themselves. The number of coal-mining companies making returns for 1921 was 3,656, of whom 1,079 reported net incomes aggregating \$82,654,787, upon which they paid taxes aggregating \$15,219,444. The remaining 2,577 coal-mining companies reported losses aggregating \$72,521,815. Subtracting the sum of the federal taxes from the aggregate earnings of the first group, it appears that the net results of the year's operations to the group lacked about \$5,000,000 of equaling the losses of the second group. The coal industry, as a whole, did not get an even break in that year, and when the figures for 1922, 1923 and 1924 are ready for publication it probably will be found that this has been the case also in at least two of these years. So much for the corporations engaged in 'warming the American people.'"

in an increase in wage schedules in the non-union fields. This would help restore proper competitive relations. We are only interested in securing fair competition. This we do not have at the present time."

## Pledge Aid to President in Improving Engineering

President Coolidge received on Sept. 4 a delegation representing the American Association of Engineers, who called to pledge the support of the organization in connection with any effort of the government to improve engineering conditions throughout the country. The delegation was composed of Harold Almert, of Chicago, president of the organization; A. N. Johnson, F. H. Newell, Morris Bien and A. B. McDaniel. They told the President that their association has a membership of 16,000, with chapters in every important center of the population, devoting their energies to the welfare of professional engineers. They explained that the American Association of Engineers differs from the more technical engineering societies in that its first consideration is of the human element. Mr. Coolidge was told that the basic purpose of the association is to make the engineer a broader and more efficient man and to arouse his active interest in public service. They called his attention also to the fact that the association at this time is initiating a national program dealing with fuel conservation, railroad valuation, the proposed department of public works and the classification and compensation of engineers.

## Canada Still Seeks Substitute For U. S. Anthracite

Various efforts made in Canada to obtain a substitute for American anthracite culminated in several plans being suggested at a recent meeting of the Montreal branch of the Engineering Institute of Canada. About a year ago, reports the Coal Division of the U. S. Department of Commerce, the Institute undertook to investigate the chances for procuring a substitute for anthracite in that market, and appointed a commission to do this work.

The committee decided it should confine its activities to the local fuel situation and reported that American anthracite has been almost exclusively used in the Province in the past for domestic purposes but the hardships and inconvenience due to strikes and coal shortages in recent years, and the probability of a gradual decrease in quality and increase in price of this coal in the future, made it advisable and necessary to carry out some educational work, in order to bring to the attention of the public the value of other fuels.

In the winter of 1922-23, says the committee, some Welsh coal was sold for household purposes, largely unscreened, but people had not found this coal satisfactory. Realizing this, the committee took the matter up with the British Trade Commissioner, who circulated the letter through trade journals in England and drew the matter to the attention of coal operators. At the same time local coal dealers were impressed with the advisability of better grading and screening, and the committee promised support in the way of educating the public.

As a result the committee reports increases in the sale and importation of Welsh and Scotch coal with greater care in grading and screening so that it has "given general satisfaction and proved its superiority over American anthracite."

A further increase in the importation of Welsh coal is expected next season, because Welsh operators have formed local connections with the intention of establishing complete unloading and screening plants in Montreal.

It was explained that coke could be obtained from Nova Scotia bituminous coal, but manufactured in Montreal, which would save the consumer money, as the coke would be much cheaper than American coal, with all economic and patriotic sentiments satisfied.

Labor difficulties play an important part both in the Nova Scotia coke industry and in the production of Welsh anthracite. Welsh and Scotch coal may be substituted for American anthracite, coke may be made from Nova Scotia bituminous, and the difficulties which have been encountered in all countries in making peat a suitable and satisfactory substitute for bituminous coal may be overcome, but it does not appear, says the Department of Commerce, as if labor difficulties either in Great Britain or Canada can be overcome any more readily than in the United States to such an extent as to seriously, for a long time at least, cut into the Canadian demand for American coal.



## "Friendly" Receiver for St. Louis Coal Co.

A "friendly" receiver has been appointed for the St. Louis Coal & Iron Co. James Duncan, one of the directors of the company, was named as receiver. The St. Louis Coal & Iron Co. is the successor of the St. Louis Coke & Chemical Co. The plants are located at Granite City, Ill., and comprise eighty Roberts byproduct coke ovens and blast furnaces, which have an output of 180,000 tons of pig iron and 500,000 tons of coke.

The National Enameling & Stamping Co. for years has had a substantial interest in the company, and the balance sheet as of Dec. 21, 1923, showed the National company to have an investment of \$1,900,000 in the St. Louis company, which was represented by bonds and preferred stock.

In 1923 the company suffered financial reverses due to labor troubles and advancing costs of material, and a reorganization committee was named to try to put the company on its feet. The company has outstanding more than \$2,000,000 in common stock, a trifle over \$3,000,000 in preferred stock and \$6,404,000 in bonds.

## Utility Coal Consumption and Power Output Hit Bottom

Electric public-utility plants consumed 2,778,293 net tons of coal during July, according to a report by the U. S. Geological Survey. This compares with 2,691,891 tons consumed in June, according to revised figures. Fuel oil consumed by utility plants in July totaled 1,391,126 barrels, compared with 1,341,426 barrels in June.

The average daily production of electricity by public-utility power plants in July was 148,300,000 kw.-hr., about 2 per cent less than the revised figures for the daily output of the month of June. Average daily output has decreased uniformly each month from April to July.

Returns from the 1923 census of manufactures just compiled by the Department of Commerce show the coal consumption of various industries to have been as follows: Cane-sugar refining, 982,652 tons; card cutting and designing, 2,469 tons; engraving and die sinking, 2,783 tons; grass mats and matting, 6,796 tons; drug grinding, 75,198 tons; theatrical scenery and stage equipment, 240 tons; gold and silver leaf and foil, 767 tons; blacking, stains and dressings, 14,060 tons; lead pipe, bar and sheet lead, 19,799 tons; graphite, 7,071 tons; lithography, 46,341 tons.



A. F. Harper

Recently resigned as superintendent of Woodward Iron Co.'s Mulga mine, Mulga, Ala., to become engineer-superintendent of Flat Top (Ala.) coal mines of the Sloss-Sheffield Steel & Iron Co.

## Our Coal Shipments to South America and Egypt Grow

Comparing United States coal export figures for the fiscal years 1924 and 1923, slight change is noted in exports to Belgium, France, Greece, Canada, Mexico and Cuba. Exports to Germany decreased 204,628 tons. The following are the principal increases in tonnage noted: Italy, 396,971 or 127 per cent; Netherlands, 98,434 or 70 per cent; Panama, 53,543 or 68 per cent; Newfoundland and Labrador, 54,364 or 1,398 per cent; Jamaica, 29,788 or 178 per cent; Dutch West Indies, 34,496 or 113 per cent; French West Indies, 72,289 or 170 per cent; Argentina, 115,657 or 150 per cent; Brazil, 429,494 or 299 per cent; Chile, 42,284 or 362 per cent; Uruguay, 55,659 or 472 per cent; Egypt, 24,384 or 300 per cent; French Africa (other than Algeria and Tunis), 37,920 or none in the fiscal year 1923.

The trend of shipments of American bituminous coal and British coal of all kinds to some of the principal foreign markets in which our coal has competed in the fiscal years ended June 30, 1923 and 1924, is shown in the accompanying table.

Our increased shipments to Italy and South America during the twelve months ended June 30, 1924, are particularly noticeable. Though the total exports during the last half of this period declined, the same thing is true of British exports, though in a less de-

## Is Ford Retailing Coal?

The announcement has gone forth to the 478 Ford agencies in the Northwest that the Ford dock in Duluth has 25,000 tons of coal on hand which will be sold to these dealers in carload lots. They may use it for their own purposes or may sell it in their communities, as they choose. This seems to offset the intimation formerly made that the Ford interests would go into the retail business.

gree. Although the increased trade of this period has been based on extremely low f.o.b. prices, it is possible that any necessary advance in the prices of American export coals will in a measure be compensated by advanced f.o.b. prices of British coals, due to the recent advance in wages of British miners.

Exports of anthracite during the fiscal year just ended amounted to 3,927,846 gross tons, an increase of 194,132 tons, or 5.2 per cent, from the preceding fiscal year. During the six months ended June 30, 1924, anthracite exports totaled 1,755,339 tons, compared with 2,172,507 tons for the preceding six months period, a decrease of 19.6 per cent.

## P. & W. V. to Segregate Coal Holdings

Directors of the Pittsburgh & West Virginia Ry., frequently mentioned as an ultimate participant in the gigantic new "Nickel Plate" group being organized by the Van Sweringens, voted Sept. 8 at a meeting in New York City to segregate their rail properties from their coal holdings, embraced in the Pittsburgh Terminal Coal Co.

It was decided to call the Pittsburgh & West Virginia Railway Co.'s entire issue of preferred shares, \$9,100,000, for redemption, in accordance with the by-laws of the company, and to offer common stockholders the right to purchase, pro rata, the capital stock of the Pittsburgh Terminal Coal Co. now in the railway treasury, amounting to 40,000 shares of preferred stock, par value \$100, and 80,000 shares of common stock, par value \$100, for the total sum of \$4,000,000. This figures that the holder of 100 shares of railway common stock may purchase thirteen shares of the coal company preferred and twenty-six shares of coal company common for \$1,300. It might, furthermore, be stated that dividends on the Pittsburgh Terminal Coal Co. preferred stock have been paid regularly since the date of issue, and in addition thereto dividends on the common have been paid into the treasury from time to time.

It has also been decided, subject to the approval of the Interstate Commerce Commission, to issue \$3,000,000 of 5 per cent equipment trust notes.

The Pittsburgh Terminal Coal Co. owns and operates 10,500 acres of bituminous-coal lands in Pennsylvania, with an estimated unmined reserve of 72,500,000 tons.

## Coal Exports from Great Britain and United States

Country	British Coal			U. S. Bituminous Coal		
	Fiscal Years	1924	Percentage	Fiscal Years	1924	Percentage
Belgium.....	5,582,623	4,661,600	-16	47,674	49,674	+3
France.....	16,472,601	16,994,862	+3	553,289	570,792	+3
Germany.....	13,487,187	10,768,038	-20	271,941	67,313	-75
Italy.....	7,246,891	6,739,119	-7	313,057	710,028	+127
Netherlands.....	6,239,241	5,692,723	-9	140,246	238,680	+70
Sweden.....	2,959,499	3,289,022	+11	33,248	18,374	-45
Argentina.....	2,320,642	2,779,451	+20	77,031	192,688	+150
Brazil.....	1,134,989	1,015,581	-11	143,445	572,939	+299
Chile.....	52,188	43,973	-16	11,683	93,967	+362
Uruguay.....	457,999	364,987	-20	11,793	67,452	+472
Egypt.....	1,670,329	1,678,620	+1	8,115	32,499	+300
Greece.....	490,170	480,228	-2	25,344	22,477	-11



## New York Retailers Hold Big Convention

The fourteenth annual convention of the New York State Coal Merchants' Association, held at Stamford-in-the-Catskills, Sept. 4-6, was the best attended in the history of the organization. Business sessions were held each morning of the three-day meeting, the afternoons and evenings being devoted to recreation. The following papers were read: "Profitable Facts and Penny-wise Fallacies," E. A. Konzelman, Buffalo, general manager Kon-Wald Engineering Co.; "Buckwheat Coal, and Appliances for its Economical Utilization," C. A. Connell, combustion engineer, Anthracite Economies Co., Philadelphia; "Business Ethics," Samuel B. Crowell, president, National Retail Coal Merchants Association; "Association Work in Chicago," L. W. Ferguson, late president, Chicago Coal Merchants Association; "The Modern Crook—A Menace to the Coal Merchant," F. W. Withey, vice-president, National Surety Co.; "What the Customer Thinks of the Coal Dealer," Robert W. Disque, business manager, *Syracuse Post-Standard*; "Advertising for the Retail Coal Merchant," by John E. Lloyd, Philadelphia, president of William M. Lloyd Co.

The officers of the association were

re-elected, as follows: Charles B. Staats, Albany, president; C. A. Elwood, Rochester, first vice-president; R. J. Wulff, Brooklyn, second vice-president; J. H. Murray, Waverly, third vice-president; J. M. Gaffers, Albany, treasurer; F. A. Eldredge, Auburn, recording secretary; G. W. F. Woodside, Albany, executive secretary.

## New York Banks Give Credit To Aid Ruhr Coal Industry

The Equitable Trust Co., heading a syndicate of ten New York banks, completed arrangements Sept. 8 for a credit of \$5,000,000, to \$10,000,000 for German coal mines. Within these limits the amounts to be extended are indefinite. It depends upon how much the German coal mining trade needs. The advances are designed to facilitate the movement of German coal, either for export or for domestic consumption. The loan is secured partly by coal already in storage, and has the guaranty both of the German coal syndicate and a number of German banks.

While the credit is of the discount type and runs for approximately six months, the German coal mines obtained it on a 6½ per cent basis.

This credit is the latest of a series under negotiation for various trade interests in Germany.

## Union Closes West Kentucky Branch Office

That the United Mine Workers are losing their grip in western Kentucky (District 23) was shown a few days ago, when a branch office of the union at Madisonville, Ky., was closed, due to the large number of union men who had deserted the union in going to work for the St. Bernard properties of the West Kentucky Coal Co., Hart Coal Co. and other companies that are operating non-union.

The stronghold around Central City, within a radius of nearly twenty miles in every direction, is as strong as ever in so far as actual operations are concerned, but the workers do not appear to be backing the union as seriously. On Labor Day a parade, which it was claimed would number 6,000 came out with but 1,002 marchers, by actual count made by operators' agents. A free dinner pulled only 1,200 all told.

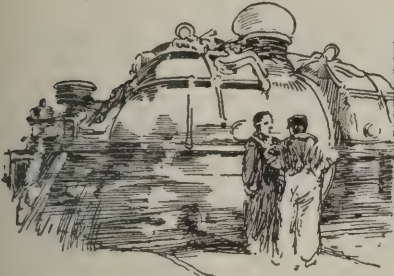
Out of Central City as far as Beech Creek in one direction, sixteen miles to Nortonville, and 20 miles toward Louisville, there are practically no operating mines, but down in Hopkins County, around Earlington and Madisonville, the strike has been fairly well broken, and also in Henderson County. In Muhlenburg and Ohio counties things are about as they have been.

## Tonnage and Value of Anthracite Shipped During 1923, by Regions and Sizes

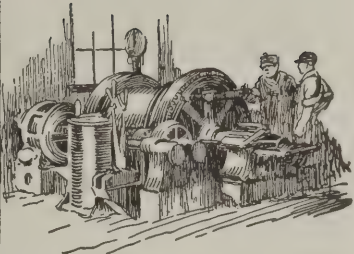
Size	Lehigh Region			Schuylkill Region			Wyoming Region			Sullivan Co.	Total	Per Cent of Total
	Breakers	Washeries	Dredges	Breakers	Washeries	Dredges	Breakers	Washeries	Dredges	Breakers		
<b>Lump</b>												
Gross tons	0	0	0	7,082	0	0	0	0	0	0	7,082	0.0
Total value	0	0	0	\$59,123	0	0	0	0	0	0	\$59,123	
Average value	0	0	0	\$8.35	0	0	0	0	0	0	\$8.35	
<b>Broken</b>												
Gross tons	166,216	2,773	0	716,682	3,047	0	2,565,411	8,367	0	14,086	3,476,582	4.7
Total value	\$1,332,154	\$21,680	0	\$6,299,891	\$28,792	0	\$19,415,267	\$59,892	0	\$122,366	\$27,280,042	
Average value	\$8.01	\$7.82	0	\$8.79	\$9.45	0	\$7.57	\$7.16	0	\$8.69	\$7.85	
<b>Egg</b>												
Gross tons	1,405,101	16,305	0	2,544,068	7,295	0	6,912,353	39,918	0	27,954	10,962,994	14.9
Total value	\$12,221,643	\$136,044	0	\$22,609,583	\$65,185	0	\$57,435,625	\$305,408	0	\$253,300	\$93,026,788	
Average value	\$8.69	\$8.34	0	\$8.85	\$8.94	0	\$8.31	\$7.65	0	\$9.06	\$8.49	
<b>Store</b>												
Gross tons	1,697,987	12,626	0	3,661,617	17,541	0	8,161,395	80,074	0	46,144	13,677,384	18.6
Total value	\$14,687,845	\$105,556	0	\$32,493,826	\$152,146	0	\$68,551,727	\$678,368	0	\$429,565	\$117,099,033	
Average value	\$8.65	\$8.36	0	\$8.87	\$8.67	0	\$8.40	\$8.47	0	\$9.31	\$8.56	
<b>Chestnut</b>												
Gross tons	2,425,775	46,856	0	4,756,618	259,318	206	10,472,092	333,278	0	61,112	18,355,255	25.0
Total value	\$20,851,822	\$388,127	0	\$42,136,250	\$2,395,854	\$1,825	\$87,469,766	\$2,856,871	0	\$582,140	\$156,682,655	
Average value	\$8.60	\$8.28	0	\$8.86	\$9.24	\$8.85	\$8.35	\$8.57	0	\$9.53	\$8.54	
<b>Pea</b>												
Gross tons	912,632	32,985	291	2,038,969	191,355	236	2,548,984	157,417	1,419	44,330	5,928,618	8.1
Total value	\$5,789,990	\$204,318	\$1,526	\$12,951,142	\$1,189,452	\$1,636	\$15,192,848	\$907,968	\$4,257	\$316,472	\$36,559,609	
Average value	\$6.34	\$6.19	\$5.24	\$6.35	\$6.21	\$6.93	\$5.96	\$5.77	\$3.00	\$7.14	\$6.17	
<b>Buckwheat No. 1</b>												
Gross tons	1,367,965	70,577	433	3,439,731	343,209	1,261	4,133,733	284,328	334	0	9,641,571	13.2
Total value	\$4,929,884	\$256,740	\$974	\$11,784,734	\$1,156,898	\$4,551	\$14,390,950	\$980,783	\$167	0	\$33,505,681	
Average value	\$3.60	\$3.64	\$2.25	\$3.43	\$3.37	\$3.61	\$3.48	\$3.45	\$0.50	0	\$3.48	
<b>Buckwheat No. 2, Rice and Birdseye</b>												
Gross tons	700,958	80,620	0	1,296,794	309,528	5,600	2,560,927	417,002	0	0	5,371,429	7.3
Total value	\$1,746,908	\$203,760	0	\$2,823,608	\$651,486	\$12,208	\$5,585,362	\$921,924	0	0	\$11,945,256	
Average value	\$2.49	\$2.53	0	\$2.18	\$2.10	\$2.18	\$2.18	\$2.21	0	0	\$2.22	
<b>Buckwheat No. 3 and Barley</b>												
Gross tons	731,739	219,449	59,876	1,735,007	411,960	156,428	1,507,814	295,312	0	0	5,117,585	7.0
Total value	\$1,134,835	\$327,431	\$81,088	\$2,350,249	\$540,244	\$158,152	\$2,111,229	\$446,836	0	0	\$7,150,064	
Average value	\$1.55	\$1.49	\$1.35	\$1.35	\$1.31	\$1.01	\$1.40	\$1.51	0	0	\$1.40	
<b>Boiler</b>												
Gross tons	14,426	0	34,125	2,710	14	12,043	85,529	17,554	3,839	0	170,240	0.2
Total value	\$5,511	0	\$40,950	\$948	\$5.00	\$11,026	\$142,051	\$24,242	\$1,052	0	\$225,785	
Average value	\$0.38	0	\$1.20	\$0.35	\$0.38	\$0.92	\$1.66	\$1.38	\$0.27	0	\$1.33	
<b>Other b</b>												
Gross tons	115,348	39,553	0	168,105	9,244	108,908	143,836	46,782	0	87,196	718,972	1.0
Total value	\$81,508	\$32,000	0	\$126,013	\$5,307	\$116,786	\$260,203	\$33,606	0	\$208,698	\$864,121	
Average value	\$0.71	\$0.81	0	\$0.75	\$0.57	\$1.07	\$1.81	\$0.72	0	\$2.39	\$1.20	
<b>Total</b>												
Gross tons	9,538,147	521,744	94,725	20,377,383	1,552,511	284,682	39,092,074	1,680,023	5,592	280,822	73,427,712	100.
Total value	\$62,782,100	\$1,675,656	\$124,538	\$133,635,367	\$6,185,369	\$306,184	\$270,555,028	\$7,215,898	\$5,476	\$1,912,541	\$484,398,157	
Average value	\$6.58	\$3.21	\$1.31	\$6.56	\$3.98	\$1.08	\$6.92	\$4.30	\$0.98	\$6.81	\$6.60	

(a) Includes 2,328,843 tons of "range" coal, valued at \$20,179,951. (b) Includes culm, No. 4 buckwheat, silt, and run-of-mine-coal. Statistics compiled by H. L. Bennett, U. S. Geological Survey.





# Practical Pointers For Electrical And Mechanical Men



## Blowpipe Renews Mine Machinery

When Equipment Fails Under Stress or Is Damaged by Accident,  
Welding Puts It Again Promptly in Service—Locomotive  
Frames and Pump Easily Repaired

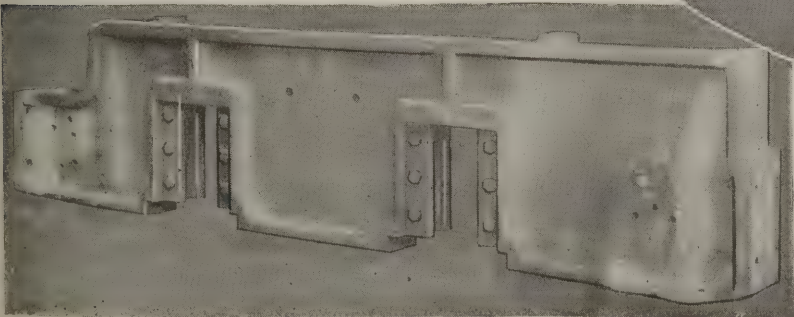
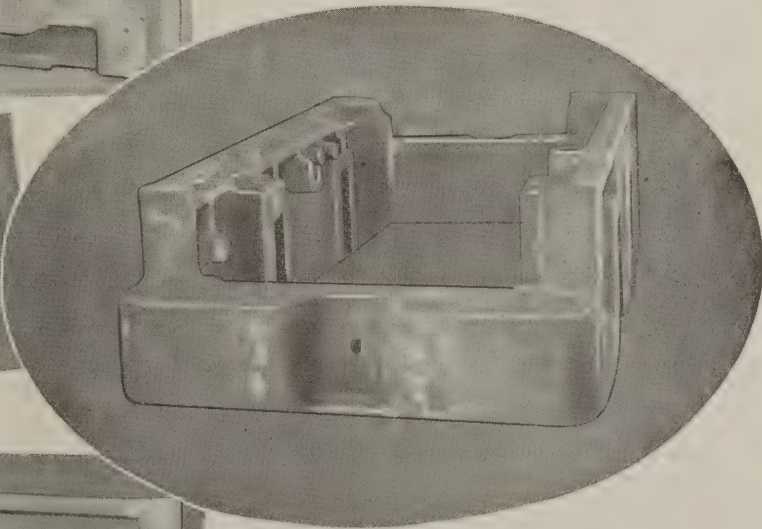
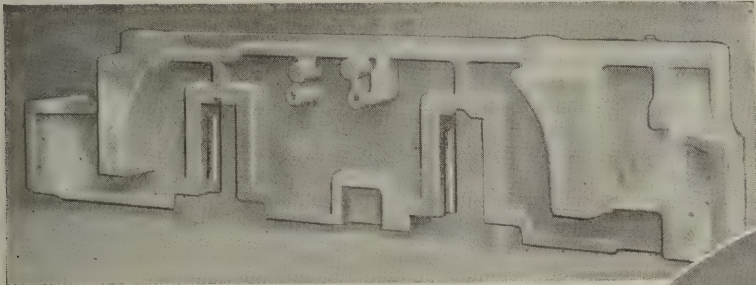
**"S**ORRY, but we have discontinued that pattern." This was the answer to efforts of a mine superintendent attempting to secure a new cast-steel frame for an electric locomotive, which had been in a smash. Not only had the frame been broken, but the electrical equipment was somewhat damaged. It was decided that if a new frame could be obtained at a reasonable cost or the old one repaired it would pay to rebuild the locomotive, otherwise not. So the remark meant that new patterns would have to be made in order to cast a new frame. And the price of this was prohibitive. This is the sort of circumstance that is liable to lead many a good machine to the scrap heap unless it is known that welding makes possible practically

any repair. The mine superintendent in this case was one of those well-informed men, for he knew the casting could be satisfactorily repaired, but had no man available who could handle a job of this size, so a competent welding shop doing business in the neighborhood got the job. There were five breaks on the frames. One end frame was broken through the center and both side frames had their ends broken off. These ends were so badly shattered that new sections were cast for welding to the frame. Preparation of these frames for welding was handled in the usual manner except that they were not preheated. Breaks were chamfered and the castings carefully lined up. Pre-

heating was unnecessary because the breaks were through metal free to expand; furthermore, the material was cast steel. The magnitude of the job readily can be judged by the time required to weld the five breaks—174 hours. Even so, the cost of the repair by welding was only one-twentieth of what a new frame would have cost.

### MINE PUMP REBUILT

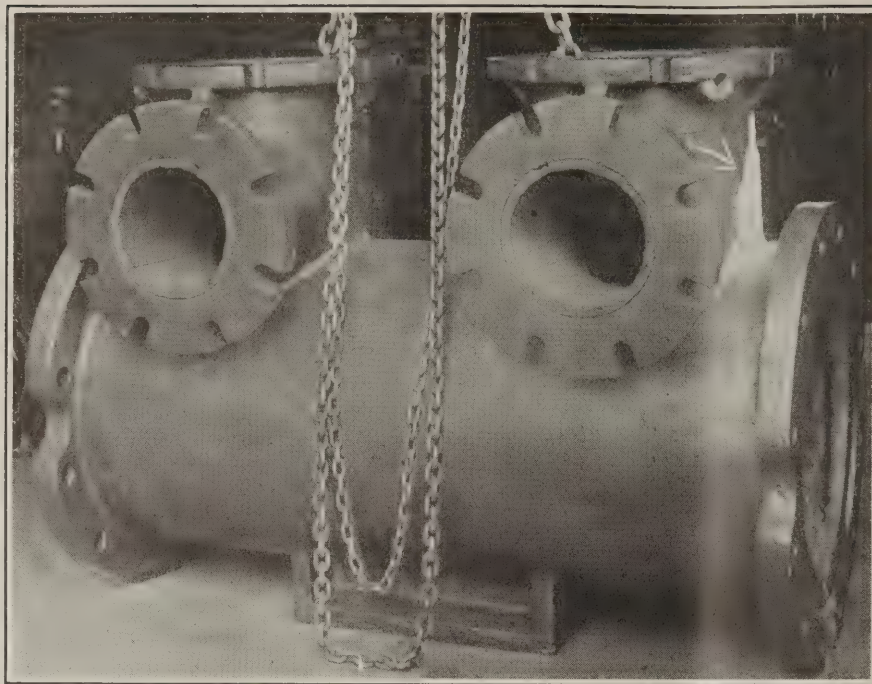
The locomotive frame was not the only large piece of mining equipment being handled by the welding shop at the time. The water end of a mine pump had been left to be reclaimed. One of the top outlets had cracked and one of the large end flanges was full of blowholes. Owing to its complexity this casting was preheated. After welding and finishing the casting, the wood lining was replaced. Here again the total cost of repairs was only a fraction of what a new casting would have cost and the delay in obtaining a new one obviated. Both the locomotive and the pump head have been in use some time since they were welded and have given a full measure of service. Without question welding is the most practical as well as the most economical method of making such repairs.



### Welded Sections of Locomotive

Many a mine locomotive bumps along from day to day and causes high maintenance charges because some part of its frame is cracked or out of alignment. Worn parts may be easily welded and refinished so as to fit like new. Old-style frames must be repaired because, in many cases, the patterns have been destroyed or replacements are few and consequently expensive.





#### Reclaimed Pump

This cast-iron water end of a plunger pump was preheated before being repaired. Worn spots, cracks and blow holes were filled, and the pump was again placed in service.

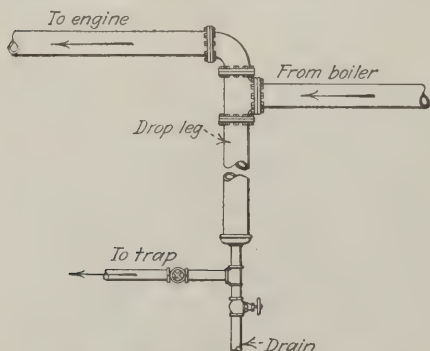
Some coal mining companies are now equipping their shops with welding apparatus which often saves money where large wastes formerly ate prof-

its. Continual progress is being made along these lines at modern mining plants.

*Oxy-Acetylene Tips*

#### Inexpensive Device Removes Water from Steam Line

At coal-mine power plants it often happens that it becomes desirable to extend the steam line, either temporarily or permanently, beyond the terminus originally intended. If satu-



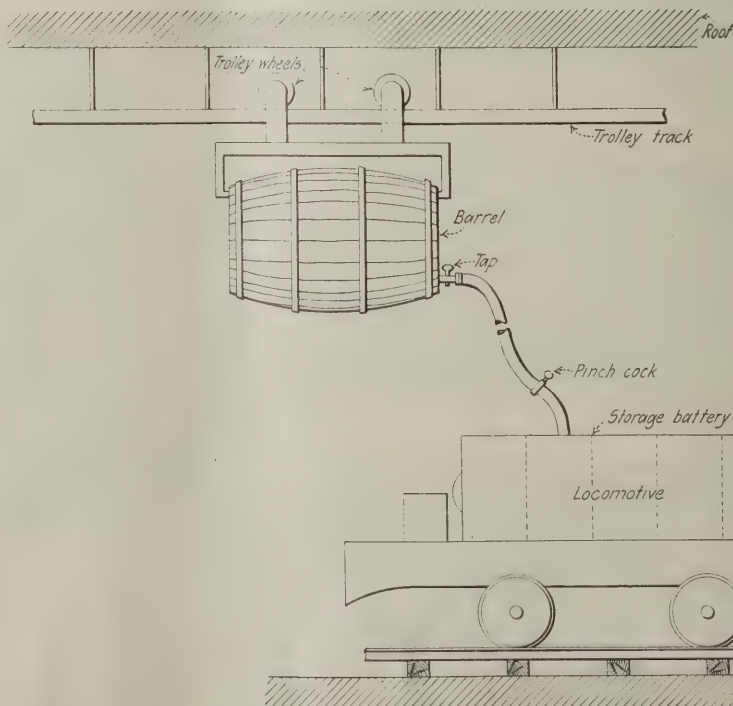
#### Improved Steam Line Drain

rated steam is used, as is usually the case, the longer the line is made the damper will be the steam at the end, whether the line is covered or bare.

The usual method of removing water from steam is by means of an eliminator connected to a trap. Neither of these devices may be available, however, for temporary work, in which case the device shown in the accompanying illustration can be used. Although the results obtained with it may not be comparable with those obtained from an eliminator nevertheless this contrivance made from pipe and fittings, odds and ends, in many instances may save much trouble from water in the steam.

As is well known, steam in passing

through the eliminator is made to turn a sharp corner, usually at fairly high velocity. In other words the steam "plays crack-the-whip" with the globules of water held in suspension by it. The same principle is utilized in the arrangement of piping here shown. Steam coming from the boiler is given a quick turn upward. The water, being many times heavier



#### Barrel on Trolley Track For Filling Cells

Distilled water in the barrel flows through the rubber tubing to a pinch cock at the end. All the cells in the twelve storage-battery locomotives in this mine are quickly filled by this labor-saving device.

volume for volume than the steam, cannot make this sharp turn and strikes the side of the tee, whence it runs down into the drop leg.

From this leg the water may be either conducted to a trap or blown off periodically by hand. The trap works automatically and requires no attention. If the drop leg must be hand-drained it is well to connect a gage glass to its side so that the height of water in it may be visible at all times. The water then need not be eliminated more often than is necessary.

#### Barrel on Trolley Track Used To Fill Battery Cells

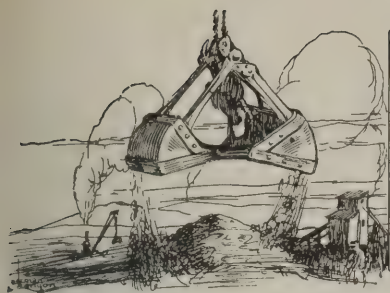
The job of putting water into the storage-battery cells used on the locomotives of the Donk Bros. Coal & Coke Co. at Thermal Mine No. 4, near Edwardsville, Ill., is no small undertaking. Twelve battery locomotives are charged in one station at the foot of the shaft.

Some of these locomotives are quite large and consequently are operated from high-capacity batteries which at the end of each day must be carefully inspected, refilled with distilled water and charged.

Both lead and iron-nickel cells are used in these batteries, the total number of cells being about 750. Every night when the locomotives arrive at the charging station each cell is opened and inspected.

To facilitate the work of filling the cells with distilled water an overhead trolley track has been mounted on the roof above the locomotives. A barrel provided with trolley wheels and bracket is suspended from the trolley and a hose with a pinch cock enables the workman quickly to fill any of the cells. All the water used in these batteries is distilled outside the mines in an electrically operated still.





# Production And the Market



## Coal Market Reflects Increasing Strength in Inquiries, Output and Prices

Abiding faith of the coal industry in an autumn revival in business is in process of fulfillment. A touch of cool weather served to inject the needed stimulus to trade, which seems to be gradually but steadily gaining in headway. While buying in many instances continues to be mostly for immediate requirements, consumption is increasing and current needs are mounting. The stockpiles of those foresighted consumers long absent from the market, having made ample preparation for a possible protracted strike last spring, are approaching the vanishing point at a rate that brings additional encouragement to the coal producer. The iron and steel industry continues on the upgrade, operations, output and orders showing a steady gain. Freight-car loadings by the railroads also are climbing at an encouraging rate. Meanwhile the volume of inquiries is increasing to a degree that would indicate that the upturn is not to be evanescent.

### Idle Mines Resume Operations

A number of mines that have been idle in various fields since the depression set in have reopened, many more are preparing to resume and most of those that have been operating on reduced schedules are increasing their working time. Distress coal has ceased to be a market factor in most fields.

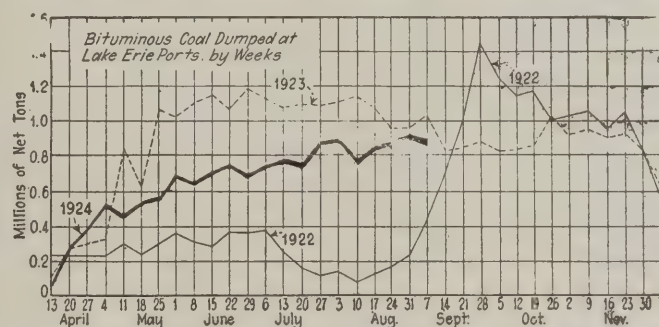
Coal Age Index of spot prices of bituminous coal not only regained the point lost last week but advanced a point beyond the figure for the preceding week, standing on Sept. 8 at 166, the corresponding price being \$2.01, compared with 164 and \$1.99 on Aug. 30. This is the highest level reached since June 30.

Activity at Hampton Roads slowed down somewhat last week, dumpings of coal for all accounts for the seven-day period ended Sept. 4 totaling 327,133 net tons, compared with 364,227 tons in the previous week.

Movement of coal up the lakes is heavy, though still far short of the volume of a year ago, as well as of

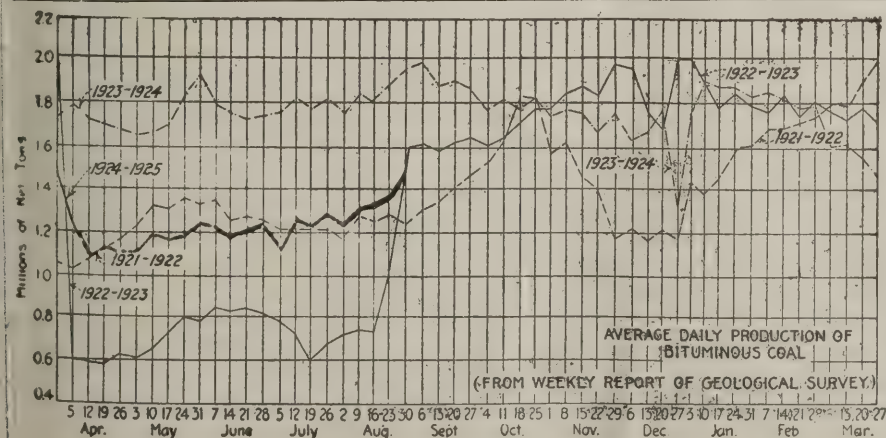
1921, which was an active season on the lakes. Dumpings during the week ended Sept. 7, according to the Ore & Coal Exchange, were as follows: For cargo, 850,865 net tons; for fuel, 47,228 tons, compared with 871,500 and 44,956 tons respectively the week before.

Production of bituminous coal took another big jump during the last week in August, almost reaching the eight and three-quarter million ton mark. The total output for the week ended Aug. 30, according to the Geological Survey, was 8,773,000 net tons, an increase of 420,000 tons over the preceding week, when 8,313,000 tons was produced, according to revised figures. Anthracite output likewise increased slightly during the



week ended Aug. 30, 1,720,000 net tons having been produced, compared with 1,711,000 tons during the previous week.

A marked improvement is observable in the anthracite market, demand being much stronger and prices notably firmer. Independent quotations in fact have increased in some instances 50c. per ton. Except for a few mines affected by local strikes, all the company collieries are working full time. Stove coal, as usual, heads the list in demand, though a steady call is in evidence for egg and chestnut and pea is not far behind. A slight stiffening in call for steam sizes also has appeared and prices are holding close to the circular.



### Estimates of Production

(Net Tons)

#### BITUMINOUS

	1923	1924
Aug. 16.....	10,843,000	7,909,000
Aug. 23 (a).....	11,383,000	8,313,000
Aug. 30 (b).....	11,737,000	8,733,000
Daily average.....	1,956,000	1,456,000
Cal. yr. to date (c)...	366,349,000	294,629,000
Daily av. to date.....	1,785,000	1,431,000

#### ANTHRACITE

Aug. 16.....	1,858,000	1,386,000
Aug. 23.....	2,165,000	1,711,000
Aug. 30.....	1,893,000	1,720,000
Cal. yr. to date.....	64,485,000	60,670,000

#### COKE

Aug. 23 (a).....	327,000	108,000
Aug. 30 (b).....	333,000	109,000
Cal. yr. to date (c)...	13,133,000	6,981,000

(a) Revised since last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.



### Midwest Pick-up Runs On

The Sept. 1 pick-up in the Midwest coal business has been running along fairly well. Most of the business, however, is in orders signed up just before the Sept. 1 increase in southern Illinois prices. It is expected to run out about the 15th and be followed by a low period until toward the end of the month, when another rise is expected in demand if not in price. Cool weather around the Lakes and Northwest territory has added its modicum, enabling many retailers to start moving domestic sizes out of their yards. Other business, however, is still slow. Steam from all Midwest mining regions is very sluggish and nut and egg still stand unbilled at almost every mine that is trying to run. Some additional properties opened up early in the month, but these were few in Illinois and fewer still in Indiana, except for mines on the Chicago, Terre Haute & Southeastern which have resumed after a week's strike over miners' trains.

As viewed from the Illinois fields, there is little business except in Franklin and Williamson County lump and egg. All other sizes in those regions are sluggish. Slow but steady increase in business has caused several properties

to prepare for reopening late this month. The increase from two to about three days a week in running time of the average commercial mine is greeted with joy in those communities whose mines actually are operating. Duquoin and Jackson County mines also feel the lump pick-up, but the Standard district still is decidedly in the dumps. The Mt. Olive field is finding a little of the domestic market and continues to move out a reasonable volume of railroad mine run and of contract screenings. There, too, a few more mines are preparing to open up.

### St. Louis Domestic Trade Better

Domestic business is picking up at St. Louis, especially on the higher grades of Illinois coal. There is some movement of anthracite, smokeless and coke, but up to the present there is no activity in Mt. Olive or Standard coals, excepting for apartment houses, which are filling up their bins. Wagonload steam is practically stopped and carload steam is slow. Country domestic demand is fairly good for lump. Other sizes are heavy. Local retail prices have not changed, although the price of Franklin County and Carterville lump advanced 25c., on Sept. 1.

### Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern		Market Quoted	Sept. 10 1923	Aug. 25 1924	Aug. 30 1924	Sept. 8 1924†
Smokeless lump	Columbus	\$5.95	\$3.60	\$3.60	\$3.50@	\$3.75
Smokeless mine run	Columbus	3.00	2.00	2.00	1.85@	2.15
Smokeless screenings	Columbus	2.35	1.25	1.20	1.15@	1.30
Smokeless lump	Chicago	6.25	3.60	3.60	3.50@	3.75
Smokeless mine run	Chicago	3.35	1.85	1.85	1.75@	2.00
Smokeless lump	Cincinnati	6.25	3.75	3.75	3.50@	4.00
Smokeless mine run	Cincinnati	3.25	1.85	1.85	1.75@	2.00
Smokeless screenings	Cincinnati	2.35	1.30	1.35	1.25@	1.50
*Smokeless mine run	Boston	5.05	4.15	4.15	4.05@	4.20
Clearfield mine run	Boston	2.15	1.85	1.90	1.45@	2.35
Cambria mine run	Boston	2.85	2.45	2.30	2.00@	2.50
Somerset mine run	Boston	2.50	2.10	2.05	1.75@	2.40
Pool 1 (Navy Standard)	New York	3.25	2.85	2.70	2.50@	3.00
Pool 1 (Navy Standard)	Philadelphia	3.20	2.40	2.40	2.35@	2.50
Pool 1 (Navy Standard)	Baltimore			2.65	2.35@	2.85
Pool 9 (Super. Low Vol.)	New York	2.55	2.10	2.15	1.90@	2.35
Pool 9 (Super. Low Vol.)	Philadelphia	2.55	2.15	2.15	1.95@	2.35
Pool 9 (Super. Low Vol.)	Baltimore	2.45	1.95	1.85	1.80@	1.90
Pool 10 (H.Gr. Low Vol.)	New York	2.20	1.85	1.95	1.65@	2.00
Pool 10 (H.Gr. Low Vol.)	Philadelphia	2.15	1.75	1.75	1.65@	1.90
Pool 10 (H.Gr. Low Vol.)	Baltimore	2.25	1.70	1.55	1.55@	1.70
Pool 11 (Low Vol.)	New York	2.05	1.60	1.65	1.40@	1.85
Pool 11 (Low Vol.)	Philadelphia	2.15	1.45	1.45	1.35@	1.60
Pool 11 (Low Vol.)	Baltimore	2.00	1.55	1.45	1.40@	1.50
High-Volatile, Eastern						
Pool 54-64 (Gas and St.)	New York	1.80	1.50	1.50	1.40@	1.65
Pool 54-64 (Gas and St.)	Philadelphia	1.85	1.50	1.50	1.40@	1.60
Pool 54-64 (Gas and St.)	Baltimore	1.75	1.45	1.35	1.35@	1.40
Pittsburgh so'd gas	Pittsburgh	3.00	2.40	2.40	2.30@	2.50
Pittsburgh gas mine run	Pittsburgh	2.50	2.10	2.10	2.00@	2.25
Pittsburgh mine run (St.)	Pittsburgh	2.30	1.85	1.85	1.75@	2.00
Pittsburgh slack (Gas)	Pittsburgh	1.55	1.30	1.30	1.30@	1.40
Kanawha lump	Columbus	3.15	2.10	2.10	2.00@	2.25
Kanawha mine run	Columbus	1.90	1.40	1.40	1.30@	1.55
Kanawha screenings	Columbus	1.25	1.05	1.05	1.05@	1.20
W. Va. lump	Cincinnati	3.75	2.05	2.25	2.25@	2.50
W. Va. gas mine run	Cincinnati	1.80	1.50	1.45	1.35@	1.65
W. Va. steam mine run	Cincinnati	1.80	1.50	1.35	1.25@	1.50
W. Va. screenings	Cincinnati	1.20	1.00	.90	.80@	1.00
Hooking lump	Columbus	2.85	2.40	2.40	2.25@	2.55
Hooking mine run	Columbus	1.90	1.55	1.55	1.45@	1.65
Hooking screenings	Columbus	1.20	1.05	1.05	1.10@	1.25
Pitts. No. 8 lump	Cleveland	2.65	2.40	2.40	2.00@	2.75
Pitts. No. 8 mine run	Cleveland	2.10	1.80	1.80	1.80@	1.90
Pitts. No. 8 screenings	Cleveland	1.35	1.20	1.10	1.10@	1.30
Midwest		Market Quoted	Sept. 10 1923	Aug. 25 1924	Aug. 30 1924	Sept. 8 1924†
Franklin, Ill. lump	Chicago	\$4.20	\$2.85	\$3.10	\$3.00@	\$3.25
Franklin, Ill. mine run	Chicago	3.00	2.35	2.35	2.25@	2.50
Franklin, Ill. screenings	Chicago	1.75	1.85	1.65	1.60@	1.75
Central, Ill. lump	Chicago	3.10	2.60	2.60	2.50@	2.75
Central, Ill. mine run	Chicago	2.20	2.20	2.20	2.15@	2.25
Central, Ill. screenings	Chicago	1.40	1.55	1.55	1.35@	1.75
Ind. 4th Vein lump	Chicago	3.35	2.85	2.85	2.75@	3.00
Ind. 4th Vein mine run	Chicago	2.60	2.35	2.35	2.25@	2.50
Ind. 4th Vein screenings	Chicago	1.60	1.80	1.65	1.60@	1.70
Ind. 5th Vein lump	Chicago	2.75	2.50	2.50	2.40@	2.65
Ind. 5th Vein mine run	Chicago	2.10	2.10	2.10	2.00@	2.25
Ind. 5th Vein screenings	Chicago	1.40	1.50	1.50	1.40@	1.65
Mt. Olive lump	St. Louis	3.10	2.85	2.85	2.75@	3.00
Mt. Olive mine run	St. Louis	2.05	2.50	2.50	2.50	
Mt. Olive screenings	St. Louis	1.45	2.00	1.75	1.75	
Standard lump	St. Louis	2.60	2.15	2.15	2.00@	2.35
Standard mine run	St. Louis	2.05	1.80	1.80	1.75@	1.85
Standard screenings	St. Louis	.95	1.20	1.20	1.15@	1.25
West Ky. lump	Louisville	2.60	2.25	2.25	2.25@	2.65
West Ky. mine run	Louisville	1.95	1.60	1.60	1.40@	1.85
West Ky. screenings	Louisville	1.05	1.30	1.30	1.25@	1.35
West Ky. lump	Chicago	2.75	2.30	2.30	2.25@	2.50
West Ky. mine run	Chicago	1.95	1.60	1.60	1.35@	1.90
South and Southwest						
Big Seam lump	Birmingham	3.75	3.40	3.15	3.00@	3.25
Big Seam mine run	Birmingham	1.95	1.75	1.75	1.50@	2.00
Big Seam (washed)	Birmingham	2.35	2.00	2.00	1.75@	2.25
S. E. Ky. lump	Chicago	3.20	2.60	2.30	2.25@	2.75
S. E. Ky. mine run	Chicago	2.30	1.75	1.60	1.50@	1.75
S. E. Ky. lump	Louisville	3.10	2.10	2.25	2.25@	2.75
S. E. Ky. mine run	Louisville	2.00	1.50	1.50	1.25@	1.75
S. E. Ky. screenings	Louisville	1.20	.95	.95	.85@	1.15
S. E. Ky. lump	Cincinnati	3.75	2.50	2.50	2.25@	2.75
S. E. Ky. mine run	Cincinnati	1.75	1.50	1.45	1.25@	1.65
S. E. Ky. screenings	Cincinnati	1.30	1.00	.95	.90@	1.10
Kansas lump	Kansas City	4.50	4.50	4.50	4.50	
Kansas mine run	Kansas City	3.50	3.50	3.50	3.50	
Kansas screenings	Kansas City	2.60	2.50	2.50	2.50	

\* Gross tons, f.o.b. vessel, Hampton Roads.

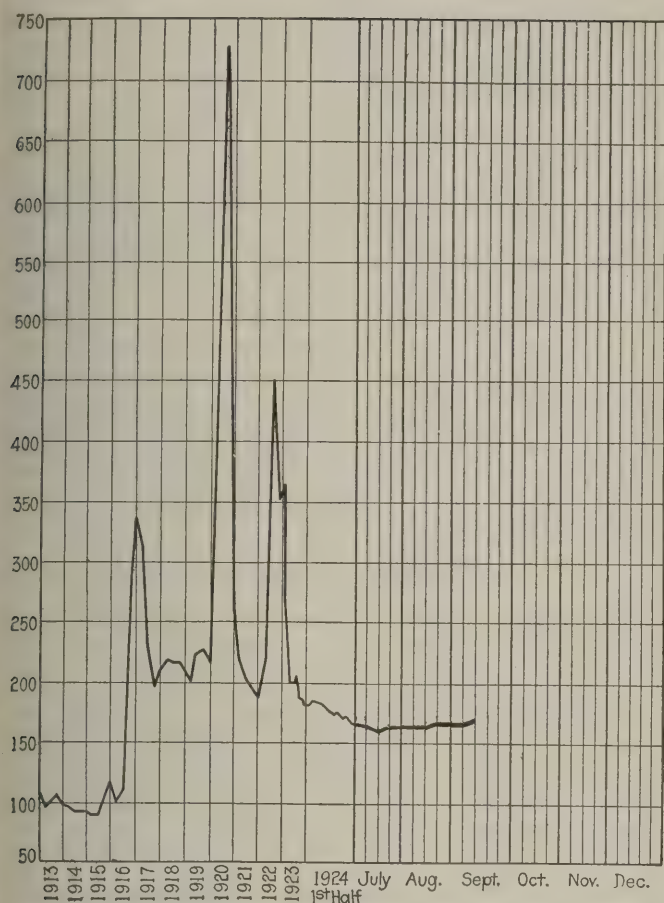
† Advances over previous week shown in heavy type, declines in italics.

### Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

	Market Quoted	Freight Rates	Sept. 10, 1923		Aug. 30, 1924		Sept. 8, 1924†	
			Independent	Company	Independent	Company	Independent	Company
Broken.....	New York.....	\$2.34				\$8.00@ \$9.25		\$8.00@ \$9.25
Broken.....	Philadelphia.....	2.39				8.90@ 9.05		9.15
Egg.....	New York.....	2.34			\$8.50@ \$9.00	8.75@ 9.25	\$8.50@ \$9.40	8.75@ 9.25
Egg.....	Philadelphia.....	2.39			9.00@ 9.70	9.00@ 9.05	9.00@ 9.70	8.80@ 9.25
Egg.....	Chicago*.....	5.06			8.17@ 8.27	8.14@ 8.20	8.17@ 8.27	8.14@ 8.20
Stove.....	New York.....	2.34			9.00@ 9.50	8.75@ 9.50	9.25@ 10.00	8.75@ 9.50
Stove.....	Philadelphia.....	2.39			9.35@ 10.00	9.05@ 9.10	9.35@ 10.00	9.15@ 9.50
Stove.....	Chicago*.....	5.06			8.63@ 8.75	8.50@ 8.64	8.63@ 8.75	8.50@ 8.64
Chestnut.....	New York.....	2.34			8.50@ 9.00	8.75@ 9.25	8.75@ 9.45	8.75@ 9.25
Chestnut.....	Philadelphia.....	2.39			8.85@ 9.80	9.00@ 9.05	8.85@ 9.80	9.15@ 9.25
Chestnut.....	Chicago*.....	5.06			8.26@ 8.40	8.44@ 8.60	8.26@ 8.40	8.44@ 8.60
Pea.....	New York.....	2.22			4.25@ 5.25	5.50@ 6.00	5.00@ 5.25	5.50@ 6.00
Pea.....	Philadelphia.....	2.14			5.75@ 6.25	5.75@ 6.00	5.75@ 6.25	5.75@ 6.00
Pea.....	Chicago*.....	4.79			5.13@ 5.45	5.36@ 6.20	5.13@ 5.45	5.36@ 6.20
Buckwheat No. 1.....	New York.....	2.22			2.25@ 2.65	3.00@ 3.15	2.25@ 2.70	3.00@ 3.15
Buckwheat No. 1.....	Philadelphia.....	2.14			2.50@ 3.00	3.00	2.50@ 3.00	3.00
Rice.....	New York.....	2.22			1.75@ 2.00	2.00@ 2.25	1.75@ 2.00	2.00@ 2.25
Rice.....	Philadelphia.....	2.14			2.00@ 2.25	2.25	2.00@ 2.25	2.25
Barley.....	New York.....	2.22			1.15@ 1.50	1.50	1.25@ 1.50	1.50
Barley.....	Philadelphia.....	2.14			1.50	1.50	1.50	1.50
Birdseye.....	New York.....	2.22				1.60		1.60

\* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.





Index	1924			1923
	Sept. 8	Aug. 30	Aug. 25	Sept. 10
Weighted average price.....	166	164	165	205
	\$2.01	\$1.99	\$2.00	\$2.49

This diagram shows the relative, not the actual, prices on four-teen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke; 1913-1918," published by the Geological Survey and the War Industries Board.

### Kentucky Prices Stiffen

Demand for western Kentucky coal has been improving somewhat, and operators have advanced prices about 15 to 20c. a ton on block, lump and egg over the week, but small nut, mine run and screenings show no change. Operators are now asking a peak price of \$2.65 for best 6-in. block coal, with best lump quoted as high as \$2.50; and egg at \$2.25@\$2.35, with some houses asking \$2.50. Nut, which comes in numerous sizes, is \$1.75@\$2.25 according to size; mine run, \$1.40@\$1.85; screenings, \$1.20@\$1.35.

Although several mines in strike-bound western Kentucky have resumed in the past few weeks, the increased production, as well as from new strip mines, has been quite well absorbed, and mines are operating on better schedules. The strike situation within a radius of twenty miles of Central City, headquarters of the district union, gives the operators no encouragement.

Feeling in Louisville coal circles has improved as a result of better demand and stiffening prices. In eastern Kentucky the eastern and northeastern sections are busy on Lake and Central States movement, while the southeastern section is shipping to the South and Southeast. The northern and eastern sections in competition with West Virginia haven't been able to advance prices, but the southeastern section has been forcing prices, and some operators are refusing offers of less than \$2.50@\$2.75 a ton, while a few are reported quoting \$3 on best grades of fine block coal. No differential is being shown in eastern Kentucky between gas and non-gas grades of domestic, but on mine run the gas coal men are holding for around \$1.50@\$1.75, whereas non-gas coal is to be had as low as \$1.25 a ton.

### Northwest Trade Is Slow

The coal trade in the Northwest is dissatisfied with the slowness of buyers. The weather has not been such as to start a drive for anthracite and domestic, and industrial bituminous business has been none too brisk. Movement off the docks is slow. The tendency at Duluth and the Twin Cities is to maintain prices firmly at present levels, however. There is enough business to halt serious undercutting. The Ford flurry seems to have passed, now that the intentions of that concern have been declared. Mr. Ford appears to be moving into retail trade through his dealers only a stock which was on his new dock at the time he bought it. Thirty cargoes of coal reached the Head-of-the-Lakes during the week, including six of anthracite.

The coal trade at Milwaukee nears the season for lower temperatures without change in the unsatisfactory conditions that have prevailed for some time. Consumers of anthracite are not apprehensive as to supply, and consequently are not filling their bins early. A slowness is noted in the soft-coal trade also, due to the fact that industrial establishments are not compelled to force their power plants, and probably also to the general disinclination to purchase until the need of fuel becomes urgent. There was an increase in receipts of anthracite by lake during the latter part of August. The total Milwaukee receipts for the month were 107,685 tons of anthracite and 353,296 tons of bituminous coal, making the season's receipts 497,223 tons of anthracite and 1,314,004 tons of bituminous coal.

### Western Business Not Rushing

While some Kansas City dealers advanced the retail price of Arkansas semi-anthracite 50c. on Sept. 1, others, who had announced their intention of so doing, postponed the move until the middle of the month. There was no advance in wholesale prices of any coal of the South-western district. Demand has improved, but not enough to affect prices, which now run thus: Arkansas semi-anthracite lump, \$5.50@\$7; mine run, \$3.50, and screenings, \$2. Oklahoma lump is \$4.50; nut, \$4; mine run, \$3.25; screenings, \$2. Kansas lump, \$4.50; nut, \$4; mine run, \$3.50; screenings, \$2.50.

The Colorado market shows a slight stimulation both in the sales and production of bituminous coals, but conditions are still abnormally slow. Colorado mines worked on an average of twenty-three hours last week with 40 per cent of the working time lost on account of "no market." A slight advance in the prices from southern Colorado fields became effective Sept. 1. Walsenburg and Canon City lump, nut and slack are \$5, \$4.25 and \$3.50 respectively, Trinidad lump is \$4 and Crested Butte high-grade anthracite \$7@\$8.75.

In Utah business is slowing up a little following a spurt caused by the rising market. Prices, however, cannot be said to be settled. Mines are working less than three days a week now. Industrial requirements for this time of the year are normal. An interesting development in Utah retail circles is the increasing demand for domestic lump, a 3x8-in. size. H. F. Fernstrom, president of the retail coal dealers' association, said it was gaining on straight lump. The price usually is 50c. a ton less than straight lump.

### Business Quickens in Ohio Markets

The quickening pulse to business at Cincinnati seems to hold. Lake buyers are more active and not so much inclined to haggle over prices. Domestic buyers also are awakening, but the most favorable sign is word from the Norfolk & Western that the supply of gondolas being set out at the mines had dwindled to a 25 per cent reduction and on the Louisville & Nashville it was 10 per cent below that of the preceding week. Movement through the gateways increased 1,255 loads last week; of the 11,521 cars, 2,013 were destined for the lakes. West Virginia coals sell a shade under Kentucky offerings. There has been little change in the smokeless market, but orders and inquiries are increasing.

A better tone is developing at Columbus, domestic demand being the best feature. Preference is shown for Pocahontas, smokeless and splints. A fair tonnage from the southern Ohio field is moving. Owing to the restriction in lump production there is a growing scarcity in screenings and small advances in the small sizes have been reported.



Steam trade is slow. Railroads are taking a fair tonnage while public utilities are good buyers. School coal is moving in considerable quantities. In the southern field the output is between 18 and 20 per cent and is still going up.

The Cleveland market is not especially keen, but with the noticeable pick-up in general business, buying for current requirements has become more widespread, hence the situation has afforded a stimulant to bring about enlarged operations as compared with the summer months. Even so, there are no reports of additional mines opening up, but many mines which have been operating have increased their output, due to the improved situation. The railroads continue to report increase in traffic, and many feel that the roads will soon be taking more coal to safeguard against weather emergencies and also to provide for their heavier requirements during the winter season.

### Gradual Gain in Pittsburgh Market

The gradual trend to heavier output in the Pittsburgh district continues and the spot market shows increased activity. Prices are unchanged except that steam slack is up about 10c. and gas slack about 5c. Movement of domestic coal continues to increase week by week but is still rather light. There is less shading than 30 days ago, the shading now on domestic 14-in. lump rarely going below \$2.50, while \$2.75 is the objective of leading operators as a minimum, it being felt that the market ought to be \$2.75@\$3, according to quality.

The feeling at Buffalo is better, the trade expecting general business to pick up soon and carry coal with it. It looks as if certain sorts of soft coal would soon be put into the regular anthracite trade, opening a new market for all bituminous. Improvement in slack is reported and some shippers have advanced prices slightly. Quotations are \$2.25@\$2.50 for Yougiogheny gas lump, \$2@\$2.25 for Pittsburgh and No. 8 steam lump, \$1.75@\$2 for all mine run and \$1.10@\$1.30 for slack.

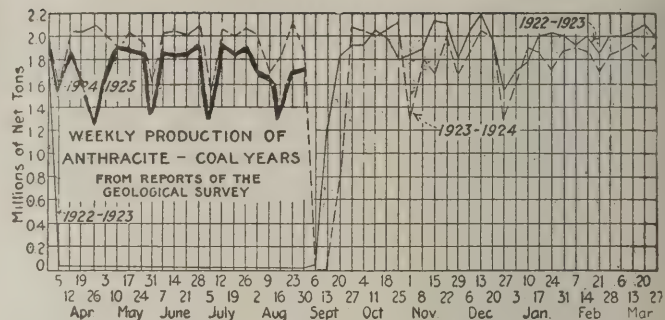
### Atlantic Markets Improving Gradually

A gradual but steady improvement is apparent at New York. Inquiries are increasing and large consumers are more in evidence. The biggest improvement is noticeable in the line trade, the situation at tidewater continuing dull but not inactive. There was a spurt during the middle of the week due to a couple of days of cool weather but the activity, while not so pronounced, continued throughout the six days. "Sold-up" is what some producers of high-volatile coals say when asked about September business and the better grades of low-volatile coals also are ordered well ahead. The improvement has not yet been sufficient to affect prices.

A slight betterment is noted at Philadelphia, the bulk of the business consisting of seasonal buying by small consumers. Spot prices are holding firm and very little coal is to be had at sacrifice prices. At the piers, business is so light that there is very little coal standing. The only coal in active demand is slack, and this continues short at times.

Not only is the domestic market at Baltimore very flat and prices low but the export situation continues extremely unsatisfactory. There are many rumors of coming improvement in local industrial sales and in export charters, but much of the prospective business seems contingent upon other developments. Only one manifest of clearance of a coal-carrying ship has been filed so far this month.

Gradual betterment is shown in inquiry and bookings at



Birmingham. Movement to the ports for bunker and export trade shows no improvement. The wholesale market is rather sluggish. Steam prices are stationary, domestic advancing to the September schedules on the medium and better grades, which are quoted: Big Seam lump, \$3@\$3.25; Carbon Hill, \$3.35; Cahaba, \$4.75@\$6; Corona, \$4; Black Creek, \$5@\$5.25; Montevallo, \$6@\$6.50 f.o.b. mines. Operating conditions are unchanged, output for the week of Aug. 23 being 325,000 tons.

### Anthracite Shows Cool-Weather Stimulus

Considerable improvement is noted in the hard-coal trade at New York over last week. Demand is stronger and quotations for independent coals increased as much as 50c. A few days of cool weather stimulated the trade to such an extent that some of the smaller independent operators withdrew their prices temporarily. September price lists of the larger producing companies as well as the larger independents for the larger domestic coals show increases ranging from 10c. to 15c. The prices for pea coal and the smaller sizes were not changed. Stove coal continues to top the list in point of demand but there is a steady call for egg and chestnut, while pea coal does not lag. Steam coals also are in better demand and No. 1 buckwheat, which has been the slowest to move for several weeks past, is much stronger. Rice and barley hold up, the better grades of the latter size bringing full circular price.

The Philadelphia market is getting a fair amount of trade. All company collieries are now making full time, except a few affected by local strikes. The demand for stove still holds up and at times appears to have grown stronger. The independent shippers, however, insist on a proportion of nut and pea to get stove, while the companies also are asking for balanced orders. Demand is so light that prices have not been increased. The steam trade still lags.

Prices at Baltimore have been advanced about 50c. above those for July and August, except for pea and buckwheat. Purchasers continue slow in ordering, despite a recent spurt to take advantage of August prices.

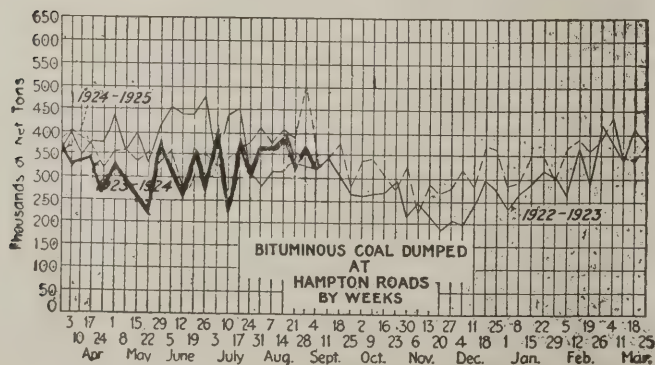
Marked improvement is reported at Buffalo. With autumn here the consumer is beginning to be interested in coal. Many empty bins are to be filled, for summer buying was so light that a spurt to catch up is due soon.

### Coke Price Recedes Slightly

The spot furnace-coke market at Connellsville has partly lost its advance of 10c. reported a week ago. In the past week there has been some coke offered at \$3 for spot or prompt shipment, and it is rumored that a September tonnage was recently offered at this figure. However, it seems \$3.10 has been paid occasionally and in one exceptional instance, in a sale not to a blast furnace, \$3.15 was paid. The market is quotable at \$3@\$3.10 against \$3.10 a week ago and \$3 for several weeks preceding. Foundry coke continues dull but the market range is unaltered at \$4@\$4.50. The *Courier* reports coke production in the Connellsville and Lower Connellsville region in the week ended Aug. 30 at 17,900 tons by the furnace ovens, a decrease of 1,300 tons, and 32,570 tons by the merchant ovens, an increase of 1,290 tons, making a total of 50,470 tons, a decrease of 10 tons.

### Car Loadings

	Cars Loaded—	
	All Cars	Coal Cars
Week ended Aug. 23, 1924.....	982,248	159,814
Previous week.....	952,888	144,549
Week ended Aug. 25, 1923.....	1,069,915	202,817





## Foreign Market And Export News

### British Market Stronger but Irregular; Output Still Climbing

The south Wales coal market is strong, shipments are heavier and many vessels are awaiting berths, but supplies are curtailed and the general situation is unsatisfactory. Orders are unevenly distributed and prices are irregular. There is little likelihood of idle mines resuming operations at an early date.

The Continental demand is weaker, causing mine owners to feel dubious as to the effect of the Dawes plan. The Miners Federation of Great Britain is against the plan, fearing depression in the industry from reparation payments in coal. Coal owners are less pessimistic and are awaiting the usual autumn upturn, but there is no spirit of confidence throughout the industry. Newcastle prices are a matter of bargaining according to berths. Freights from Wales to west Italy are 8s. 6d. All rates are weak on account of the excess tonnage offering.

The output of the British collieries during the week ended Aug. 23, a cable to *Coal Age* states, was 5,279,000 tons, according to the official reports. This compares with 5,193,000 tons produced during the week ended Aug. 16.

#### French Coal Market Quiet; New Business Scarce

Calm prevails in the French market, little new business being in sight. The output of industrial coals from the Nord and Pas-de-Calais mines sells easily and no appreciable quantities are put in stock, even of dry duffs, which are in least demand.

The strike in the Mons coal basin is expected to increase the sales of the neighboring French coal fields, though its effect probably will be limited. Efforts are being made by the French collieries to stimulate buying in the region of Rouen. In the North, the sugar-making plants are replenishing their coal supplies, which will be fully covered soon.

In house coals the current of orders is sufficient to absorb production.

The rolling-stock situation is satisfactory and freight has been lowered by 1 f. to 19 f., Béthune-Paris.

Deliveries of indemnity fuels to France and Luxemburg for the first eighteen days of August were 179,800 tons of coal, 173,200 tons of coke, and 8,000 tons of lignite briquets.

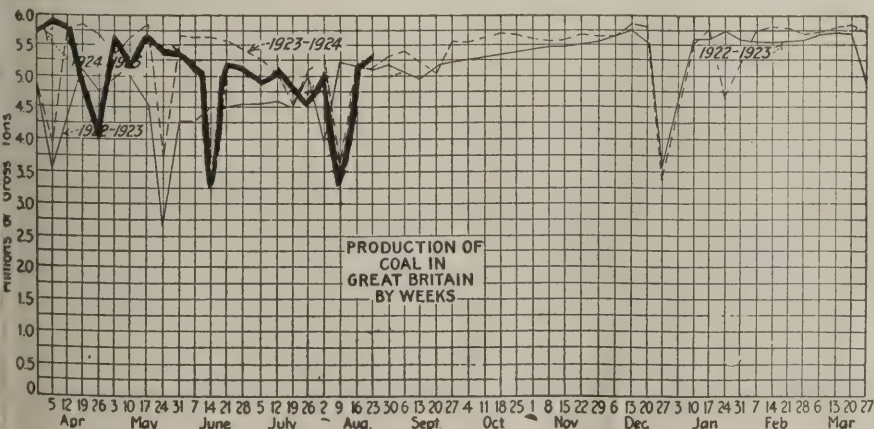
Deliveries of coke to the O.R.C.A. continue to be light. During the first twenty-six days of Aug. only 237,172 tons was received.

The strike of Belgian miners in the district of Borinage continues, recent reports being to the effect that ministerial intervention might lead to a meeting of conciliation between employers and miners. It is feared, however that the strike may extend to other Belgian fields.

#### United States Coal and Coke Exports During July

	1923	1924
Anthracite.....	455,370	290,097
Bituminous.....	2,278,241	1,630,849
Exported to:		
France.....	97,028	26,752
Italy.....	69,723	115,055
Netherlands.....	124,021	
Other Europe.....	83,288	15,350
Canada.....	1,698,896	1,202,400
Panama.....		12,049
Mexico.....	11,190	4,299
Br. W. Indies.....	9,114	11,641
Cuba.....	57,530	44,337
Other W. Indies.....	15,003	10,101
Argentina.....	25,802	19,104
Brazil.....	42,508	104,959
Chile.....	5,459	6,905
Egypt.....	2,425	4,191
French Africa.....	12,379	21,992
Other countries.....	23,875	31,714
Coke.....	60,462	48,983

	IMPORTS
Anthracite.....	4,665
Bituminous free.....	12,211
Bituminous dutiable.....	49,645
Imported from:	
United Kingdom.....	4,945
Canada.....	49,652
Japan.....	570
Australia.....	6,229
Other Countries.....	460
Coke.....	3,486



#### Hampton Roads Market Quiet; Prices Stiffen

The market at Hampton Roads is quiet, with a slight stiffening in prices, due more to a somewhat depleted surplus rather than to any extra demand. Business in all lines is holding its own with a few scattered cargoes for Brazil and Italy providing the only activity in foreign trade.

Coastwise trade has not picked up to any great extent, although a few cargoes have been moving North. Bunkers remain fair with a slight increase in general shipping having a tendency to increase business in this channel.

#### Export Clearances, Week Ended Sept. 6, 1924

FROM HAMPTON ROADS	
For Africa:	Tons
Dan. Str. Kina, for Dakar.....	7,606
For Brazil:	
Dan. Str. Ellen Jensen, for Rio de Janeiro.....	4,540
Br. Str. Wearpool, for Rio de Janeiro.....	7,272
For Newfoundland:	
Nor. Str. Betty, for Humbermouth.....	3,557
For Canal Zone:	
Amer. Str. Ulysses, for Cristobal.....	12,026
For Cuba:	
Br. Str. Silverway, for Havana.....	3,480
Ital. Str. Stella, for Havana.....	3,927
For India:	
Amer. Str. Crisfield, for Calcutta.....	5,533
For Italy:	
Ital. Str. Columbia, for Trieste.....	4,695
For West Indies:	
Br. Str. Berwindmoor, for Fort de France.....	9,453

FROM BALTIMORE	
For Newfoundland:	
Dan. Str. Nordhavet, Corner Brook.....	4,854

#### Hampton Roads Pier Situation

	Aug. 28	Sept. 4
N. & W. Piers, Lamberts Pt.:		
Cars on hand.....	1,082	1,537
Tons on hand.....	67,931	93,619
Tons dumped for week.....	124,903	100,851
Tonnage waiting.....	10,000	9,000
Virginian Piers, Sewalls Pt.:		
Cars on hand.....	1,372	1,285
Tons on hand.....	100,100	92,400
Tons dumped for week.....	110,879	101,362
Tonnage waiting.....	7,300	22,048
C. & O. Piers, Newport News:		
Cars on hand.....	1,521	1,895
Tons on hand.....	80,875	104,430
Tons dumped for week.....	89,221	90,763
Tonnage waiting.....	225	2,815

#### Pier and Bunker Prices, Gross Tons

PIERS	
	Aug. 30
Pool 9, New York.....	\$4.50 @ \$4.85
Pool 10, New York.....	4.35 @ 4.65
Pool 11, New York.....	4.00 @ 4.35
Pool 9, Philadelphia.....	4.90 @ 5.25
Pool 10, Philadelphia.....	4.45 @ 4.70
Pool 11, Philadelphia.....	4.30 @ 4.50
Pool 1, Hamp. Roads.....	4.05
Pool 2, Hamp. Roads.....	3.95
Pools 5-6-7 Hamp. Rds.....	3.85 @ 4.00
BUNKERS	
Pool 9, New York.....	4.75 @ 5.10
Pool 10, New York.....	4.60 @ 4.90
Pool 11, New York.....	4.25 @ 4.60
Pool 9, Philadelphia.....	4.90 @ 5.25
Pool 10, Philadelphia.....	4.75 @ 4.95
Pool 11, Philadelphia.....	4.50 @ 4.70
Pool 1, Hamp. Roads.....	4.15
Pool 2, Hamp. Roads.....	4.05
Pools 5-6-7 Hamp. Rds.....	3.85 @ 4.00

#### Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations by Cable to Coal Age	
	Aug. 30
Cardiff:	
Admiralty, large.....	28s. 6d. @ 29s.
Steam smalls.....	17s.
Newcastle:	
Best steams.....	20s. 9d. @ 24s.
Best gas.....	22s. 6d. @ 23s.
Best bunkers.....	20s.

†Advances over previous week shown in heavy type, declines in italics.





## News Items From Field and Trade



### ALABAMA

The Corona Coal Co. is making preparations to open up some new mines at Mount Valley, near Oakman. A new railroad is to be constructed to the openings.

The Bankhead Coal Co. is constructing a tippie at its new openings near Jasper, Walker County, and it is stated will be in position to produce coal from these mines by the middle of October.

An increase of \$775,000 has been made in the capital stock of the Pratt Fuel Corporation, making the capitalization \$1,000,000. This company, of which Walter Moore, of Birmingham, is president, by reason of the taking over of numerous smaller coal mining operations, principally in the Walker County field, is now one of the largest commercial and domestic producers in Alabama.

During 1923 Alabama's coal production was 20,919,303 tons from 208 mines, an increase of 2,161,622 tons over 1922, according to the official report of C. H. Nesbitt, state mining inspector, made to Governor Brandon. A similar increase in coke output also is shown. In 1923 4,689,641 tons of coke was produced, as against 3,760,064 tons in 1922, an increase of 919,577 tons. Inspector Nesbitt declares that the beehive oven is fast disappearing in Alabama, being replaced by the byproduct type. In 1923 168 ovens were erected in Alabama and all were of the byproduct type. Mr. Nesbitt says that Alabama is increasing its production of coke every year. Last year 6,895,294 tons of coal was burned to produce 4,698,641 tons of coke.

### ARKANSAS

Coal Mines Nos. 2 and 6 operated by the Western Coal & Mining Co., near Altus have been closed indefinitely.

E. W. Hogan, superintendent of the Bernice anthracite mines, announces that mine No. 3 will be opened for operation soon. No. 3 is a slope mine, but it has the same vein and quality of coal as the original Bernice anthracite. An undercutter and other modern machinery will be used and the coal will be hauled by a narrow-gauge railroad, which is completed, to the tippie at mine No. 2 for crushing and sizing. About 20 men will be employed and the force will be increased as the working space becomes larger.

### CALIFORNIA

The Darling and Morris Brothers, of Kennedy Flat, have opened up a small coal mine near Buena Vista, in Amador County, 40 miles west of Sacramento. They expect to produce about 50 tons a day. This is an operation which was worked many years ago for awhile.

### COLORADO

During the month of July Colorado mines produced 616,186 tons of coal. This is a decrease of 73,068 tons as compared with the corresponding month last year. The total number of men employed in and about the mines in July was 12,317.

### IDAHO

H. F. Samuels, who forced the Oregon Short Line to supply rail service on the discontinued branch line from Tetonia Junction to his reopened Brown Bear mines in the Teton basin, has won another battle with the road. He has obtained from the state Public Utilities Commission an order cutting 10 to 20 per cent from the rates on coal which the road fixed to Idaho points when the mines began producing, during the summer.

### ILLINOIS

The McLean County Coal Co. has opened its Bloomington mine, which had been closed since last April.

A new wagon mine has been opened on the farm of E. I. Blevins, in the vicinity of Galesburg.

Coal has been found on the Fred Wallbaum farm, just north of the city limits of Ashland. The vein is 4 ft. thick and has a substantial slate and sandstone roof. The vein was struck at about 200 ft., but drilling will be continued.

The Peabody Coal Co., of Chicago, has bought outright the mines of the Springfield District Coal Mining Co. in and around Springfield. To do this an additional \$1,000,000 of Peabody stock was issued, raising the total from \$8,000,000 to \$9,000,000, and the mines were paid for by transferring Peabody stock to the estate of the late F. S. Peabody, which owned the Springfield District Coal Mining Co. The Peabody Coal Co. has been operating the mines and selling the coal ever since the formation of the Springfield company.

Frank Farrington, state union president, comes out in a public statement

denying a news story printed in the *Illinois Miner* to the effect that there are 2,000 non-union miners working in the small mines of the Fulton-Peoria district, and that the 2,000 are causing great union anxiety. He said that the state coal report of 1923 showed only 383 men working in the wagon mines of Peoria County and declares that everything but wagon mines has long been solidly organized and still is. Therefore he denies flatly that there are 2,000 non-union men mining coal there. He admits many of the little wagon operations are not organized but that steady effort is being made to get them into line.

### INDIANA

Two Indiana coal companies are trying to collect \$160,000 from the Southern Ry. because of alleged discrimination against them in the distribution of cars between September, 1922, and March, 1923. The two companies are the J. I. Wooley Coal Co. and the Warwick Coal Co., both of Evansville. They filed their complaint with the State Public Service Commission.

A number of mines in the Terre Haute district have reopened within the last fortnight. The Bardyke mine, the property of the Fort Harrison Mining Co., has reopened with 400 men employed. The Pine Ridge mine, belonging to the Binkley Coal Co., also has begun operations with 300 men employed. The Pine Ridge mine is near the Bardyke mine, in the vicinity of New Goshen. The Bardyke mine has been closed for about eight weeks for extensive repairs. With the reopening of these two mines, more than twelve mines in the Terre Haute vicinity have been reopened, re-employing more than 1,200 miners.

### KENTUCKY

The Gatliff Coal Co., of Williamsburg, which recently increased its capital stock to \$375,000, has 3,000 acres of coal land under development, and will have daily output of 15,000 tons.

It was reported from Frankfort on Aug. 22 that Thomas P. Middleton, of the "blue sky" department, State Banking Commission, had authorized the Clay County Coal Co. to sell \$75,000 worth of bonds in Kentucky.

The Mayking Coal Co. has been bought by the Imperial Elkhorn Coal Co., of Detroit, Mich., at a price not made public. The capacity of the mine at Mayking has been only 10 cars a



day but the new owners expect to increase this.

## MISSOURI

Supply Commissioner Gus Oetting of St. Louis, has let contracts for coal to be used in city institutions, municipal buildings and the water works during 1924-25 totaling approximately 126,000 tons. The Lake & Export Sales Corporation was awarded the contract for water works coal at \$2.75 per ton delivered on screenings from its mine at Marion, Ill. Other contracts let were: City Hall, wagon delivery, to Berry-Bergs Coal Co., \$3.40 per ton; City Hospital, washed No. 4 coal, Union Fuel Co., \$4.01; Court House and City Infirmary, mine-run coal, Berry-Bergs Coal Co., \$3.73; City Hospital No. 2, Inland Valley Coal Co., \$3.68, and for other buildings and institutions, Union Fuel Co., \$4.06.

## MONTANA

The new Northern Pacific Ry. strip mine at Coalstrip, 40 miles south of Forsyth, began loading coal Sept. 1 and may soon attain an output of 50,000 tons a month. The coal lies under cover varying from 35 to 75 ft.

The Gilbert-Crawford Coal Co., with a mine near Roundup, has been reorganized after a bitter struggle by the officers to retain control. Walter Gilbert and Charles A. Crawford, president and secretary, have withdrawn. The property has been taken over by a concern known as the M & M Coal Co., which has as its officers Fred Buck of Helena, president; Ben Deinard, of Minneapolis, Minn., vice-president, and Henry Unschuld, of Minneapolis, secretary-treasurer. The directorate consists of the three officers and Percy Gaw, of Helena, and David Phillips, of Minneapolis. Headquarters will be in Helena. A change of capitalization from \$100,000 to \$500,000 was made.

## OHIO

The New York Coal Co.'s mine, No. 26, at Nelsonville, resumed operation Aug. 29 after a long period of idleness. More than a hundred men are at work.

Jerome Watson, chief inspector of mines of Ohio, and six deputies have started an inspection of the Blue Rock Mine, in Belmont County, which was flooded in 1913 and abandoned at that time. The workings have been filled

with blackdamp and deadly gases. The inspection will be made with a view of opening the mine after the necessary repairs are made. The chief inspector and his deputies also will inspect the Lincoln Mine of the Lorain Coal & Dock Co., also in Belmont County, which was sealed Aug. 22 because of a fire. If this is found to be extinguished the mine will be opened and repairs will be made by the owner. The same inspectors have arranged to inspect the Doanville mine at Doanville, Hocking County, which was sealed in December, 1920, following a gas explosion. This will be thoroughly explored and if conditions warrant it also will be opened.

## OKLAHOMA

There has been an increase in the Henryetta district coal output. The Crowe Coal Co., having obtained the Frisco R.R. contract, has for some time been loading 400 tons per day at its Whitehead mine. Other mines nearby also are reopening.

The Kalin-Inla mine, near Wilburton, which was raided by a band of men on July 18, and a number of non-union workers forced to quit work in the shaft, resumed operations Aug. 26 under a heavy guard of state troops and state police. Approximately fifty men reported for duty and the full crew of 150 is expected to be at work in a few days. Eight coal mines now are operating in Latimer County under open-shop conditions.

## PENNSYLVANIA

H. B. Douglas, assistant to F. E. Herriman, president of the Clearfield Bituminous Coal Corporation, with headquarters at Indiana, Pa., has resigned after eleven years service with the corporation, and the position has been abolished.

Cranberry local 1434, of the United Mine Workers, Hazleton, is making an effort to have Senator LaFollette, independent candidate for President, address the members on a date to suit his convenience.

As a consequence of the lull in the hard-coal market 417,000 tons of anthracite is now stored in plants of the Pennsylvania Coal Co. and the Lehigh Valley Coal Co. in the Pittston field. At the present time the storage plant of the Lehigh Valley company at Ransom, Pa. contains 122,000 tons of pea coal alone. The Ransom plant can han-

dle 360,000 tons. An average of 10,000 tons has been dumped there for the past four or five weeks. The Pennsylvania company is storing most of its coal at Coaldale. At the present time it has 200,000 tons there. At the Dunmore storage plant of the same company 80,000 tons is stored while 15,000 tons is to be found at No. 9 mine in Pittston. The Glen Alden company also is storing thousands of tons of anthracite.

Joseph J. Walsh, of Wilkes-Barre, state chief of the Bureau of Mines, has decided to open a new file in the state offices in promotion of mine safety work. The new file will carry the records of the work done in all coal-company operations in the anthracite field in first-aid work. Mr. Walsh told the officials of the Hazle Brook Coal Co. at the first-aid outing of that corporation at Hazle Park, Hazleton, that he would open the new file at once.

The property of the Schuylkill Valley Coal Co., which operation has been suspended for months, has been sold for \$184,100 to the Randolph Coal Co., a Delaware concern recently organized for the purpose of bidding in this property and operating it.

The Lincoln Gas Coal Co., of Pittsburgh, has closed down its mine at Lincoln Hill, in Washington County, about a mile and a half from Washington, in order to build a new steel tippie and a new fan. The new tippie will be thoroughly modern, with shaking screens, picking tables and loading booms. The installation probably will be completed in six weeks.

The Orient Mine, in the Connellsville region, recently acquired by the Hillman Coal & Coke Co., of Pittsburgh, at the sheriff's sale of the American Coke Corporation properties, has resumed coal shipments, after being idle for several months. The Buckeye Coal Co., subsidiary of the Youngstown Sheet & Tube Company, has started up the Brier Hill mine, which had been idle for about a year.

One of the largest contracts for coal from central Pennsylvania in years was closed on Sept. 2, when John C. Cosgrove, of Cosgrove & Co., closed with the Staten Island Edison Corporation for 700,000 tons over a period of five years. The Edison plant was recently purchased by new interests and will be greatly enlarged. The Baltimore & Ohio R.R. is one of the largest consumers of Staten Island current, much of which will be used in the proposed electrification plans for the Staten Island division of that road.

Steps have been taken by the Cosgrove-Meehan Coal Corporation at its Thermal mine No. 10, at Foustwell, Somerset County, to put on the market for domestic use three sizes of bituminous coal, lump, egg and slack, to compete with anthracite. A Marcus shaker screen is being installed and steam shovels are at work and the new equipment will be in operation within a few weeks. Three cars may be loaded at the same time with the various grades of coal.



Typical Wyoming Coal Tippie with Characteristic Surroundings

This is at a Union Pacific mine, Winton, Wyo., a mine where adobe dusting by hand started four years ago at a time when only two or three other mines in the country were trying to reduce coal-dust explosion dangers by spreading inert dust.



## TENNESSEE

The Cambria Coal Mining Co., Briceville, of which H. M. Stokes is superintendent and general manager, has acquired the properties and equipment of the Cross Mountain Coal Co., which includes 12,000 acres of undeveloped coal land, about 200 miners' houses, three commissaries, office building and equipment.

## TEXAS

The Texas Pacific Coal & Oil Co. reports for the quarter ended June 30, 1924, net income of \$686,254, after expenses, but before depreciation and depletion, equal to 81c. a share (\$10 par value) on the \$8,448,048 capital stock, compared with net income of \$581,604, or 69c. a share, in the preceding quarter. Income account for six months ended June 30, 1924, showed net income of \$1,267,858, before depreciation and depletions, or \$1.50 a share, compared with net income of \$1,759,014, or \$2.08 a share in the corresponding period of 1923.

## UTAH

H. H. Calvin, former sales manager for the United States Fuel Co. and the Utah Coal Sales Agency at Salt Lake City, has been made special sales representative of the company. A. K. Bell is now general sales manager.

Dr. A. L. Murray, surgeon for the U. S. Bureau of Mines, with headquarters in Salt Lake City, has been assigned to make an inspection and instruction tour of all mine rescue cars and stations throughout the United States.

L. F. Rains, president of the Carbon Fuel Co., Salt Lake City, is chairman of the committee in charge of that city's Defense Day plans.

Beginning Sept. 1 all coal moved from mine yards in Utah to distributing points will come under demurrage rules after 24 hours' free time. Also, in the allotment of cars loads will count the same as empties. This, it is stated, will be the first time demurrage rules have been applied in this state.

## WASHINGTON

The Koltop Coal Co., Mt. Vernon, has increased its capital stock from \$95,000 to \$395,000.

Tax valuations have been reduced in Tacoma on the properties of the Wilkeson Coal & Coke Co. by 25 per cent and of the Carbon Hill Coal Co. from \$341,420 to \$245,000. These reductions were made in response to the pleas of the companies that they have not been able to make any money.

The Lisco mine, at Renton Junction, shut down since June 1 for repairs, has resumed operations with much new equipment installed, including an electric hoist, shaker screens and a washing plant.

In the western Washington mine-rescue and first-aid meet, Aug. 9, the Bellingham team won first place. Newcastle second, Carbonado third and

Black Diamond fourth. The first-aid contest was won by Newcastle with Burnett second and Black Diamond third.

Mine No. 3 of the Northwest Improvement Co., at Ronald, near Roslyn, has shut down indefinitely, throwing 325 men out of work. There is no immediate plan of reopening until the coal market improves.

## WEST VIRGINIA

The Tunnelton Freeport Coal Co., operating at Blaser, near Tunnelton, in which Cumberland people are extensively interested, will resume operations within a short time.

The purchase of 800 acres of Pittsburgh coal in Cass district of Monongalia County, by W. K. Hatfield, of Morgantown, has been confirmed by Mr. Hatfield, but he said that he was "acting for other interests whose identity he could not disclose now." The consideration involved, it is reported, is about \$400,000.

In order to avoid causing an outbreak such as occurred in the Mingo field, the operators in the Kanawha field, who had determined to evict those tenants who had refused to return to work, have reconsidered their decision at the instance of Governor Morgan and will institute suits and obtain judgment for possession, costs and rent.

The Allied Coal Co. has purchased a complete mining plant and 79.56 acres of coal in Clay district of Harrison County. The purchase covers the mining equipment on the premises and all the mining rights. The property was sold by Chester G. Shinn, C. M. Tarleton, Mary C. Tarleton, L. A. Riggs, Tusca Morris, Harriet B. Morris, Harry B. Crane, Edna D. Crane, Boyd S. Fleming and Eva B. Fleming, all of Fairmont.

J. O. Caldwell, secretary of the Northern West Virginia Coal Operators Association, has severed his connection with that organization to become identified with the traffic department of the various Hutchinson coal companies including the Hutchinson Coal Co., Hutchinson Island Creek Coal Co., Logan Mining Co., and the Rich Creek Coal Co. Mr. Caldwell became chief clerk of the Northern West Virginia Association in August, 1920, and in February, 1922, was made secretary of the association after George S. Brackett had been made executive vice-president.

One of the largest single orders for mine cars ever given by a West Virginia mining company was placed recently by the American Coal Co., having operations on the Norfolk & Western RR. in the Tug River and Pocahontas districts, the order calling for \$110,000 worth of new cars for immediate delivery. All of the cars will be of the most modern type now in use.

Eight miles of concrete roads, representing an expenditure totaling \$650,000, have been formally presented to the County of Logan by the Island Creek Coal Co., of Holden. The Island Creek company purchased the right of

way, graded and paved the roads at its own expense and without any contribution by the county. The roads are in three sections—the Trace Fork, Whitman Creek and Coperas sections.

Fire believed to have been of incendiary origin partly destroyed the tippie of the Arnettville plant of the Fort Grand Coal Co. late in August causing a loss estimated at about \$20,000 and suspension of operations. The mine, which is located on the Indian Creek & Northern R.R., has been operating open shop and paying the 1917 wage scale for several years. The mine has been producing about 500 tons a day, much of which is for railroad fuel purposes. The county court of Morongalia County has indicated that it will offer a reward in addition to that offered by the coal company for the capture of the person or persons implicated.

## CANADA

Control of the lignite plant at Bienfait, Sask., is now in the hands of the Saskatchewan government, which is negotiating with one or two firms to take over the plant and operate it as a commercial utility, according to an announcement made at Regina, Sask., by J. C. Gardiner, Minister in charge of industries, who says that the plant has served its purpose in demonstrating the possibility of making briquets from carbonized lignite.

The plant of the Phenix Briquette & Coal Fuel Co., Ltd., has been sold under chattel mortgage in Toronto for \$6,000. W. T. Pember, president of the company, has taken over the plant on a fifteen-year lease from the Toronto Harbor Commission. The total liabilities of the company are \$32,000.

Sir Thomas Tait, president of the Grand Lake Coal & Ry. Co., has been elected a vice-president of the Detroit United Rys. He has been identified with the Canadian Pacific Railway for many years and was one of those instrumental in developing the Grand Lake bituminous coal properties. Sir Thomas headed the company that built the railroad line from Chipman to Fredericton. Previously there had been no railway connections with Minto, which is the chief Grand Lake mining center. The line is about 45 miles long.

At the annual general meeting of the Crow's Nest Pass Coal Co., held at Fernie, B. C., recently, the following officers were elected: President and general manager, W. R. Wilson; first vice-president, H. B. McGiverin; second vice-president, A. H. McNeill; secretary, J. S. Irvine; treasurer, A. A. Klauer; and Comptroller, G. H. Hess. The report for 1923 was tabled. During the year the company produced 775,366 tons of coal and 65,990 tons of coke and made an operating profit of \$471,679 from coal mining and \$61,497 from timber and other sources, enabling the payment of four quarterly dividends of 1½ per cent, aggregating \$372,690, and leaving a credit at the profit and loss account of \$14,276, at the end of the year.



## New Companies

The **Continent Coal Co.** has been incorporated at Birmingham, Ala., by T. S. Abemathy, J. M. Donaldson and G. G. Tait.

The **R. L. Brown Coal Co.**, Middlesboro, Ky., capital \$20,000, has been chartered by R. L., C. O. and L. I. Brown, all of that city.

The **Jennie Wilson Coal Co.**, Owensboro, Ky., in the western Kentucky district, has been chartered with a capital of \$10,000, by Jennie Wilson, Russell Wilson Land George S. Wilson.

The **Weissenborn Coal Co.** has been incorporated in St. Louis, Mo., with a capital stock of \$60,000, by J. E. Weissenborn, Rosalia Weissenborn and S. A. Weissenborn, 3632 Hartford St.

The **San Bois Coal Mining Co.** has been incorporated in McCurtain, Okla., by G. W. Shields, McCurtain; Earl Cobb, Amarillo, Tex., and L. E. Turner, 517 N. 21st St., Fort Smith, Ark.

The **Wayne Coal & Mining Co.** has been incorporated in Tulsa, Okla., with a capital stock of \$50,000, by R. D. Leydig, Edmond Boydston, Chas. A. Holden and others.

The **Hatfield Coal Co.** has been incorporated in Covington, Ky., with a capital stock of \$25,000, by J. T. Hatfield, Chas. A. Hunt and M. H. McLean.

The **Sharon Pond Creek Co.** has been incorporated in Sharondale, Ky., with a capital of \$100,000, to develop coal land, by Wm. York, A. B. York and others.

The **Mammoth Coal Mining Co.**, 1519 American Trust Bldg., Birmingham, has been organized with C. Cooper, president, and J. M. Donaldson, secretary and treasurer. Eighty acres of coal land is under development, with a possible daily output of 200 tons.

The **Solar Coal Co.**, of Freeburg, Ill., has been capitalized at \$180,000 by John White, W. C. Wolf, Robert White, Samuel White and John Mackie.

The **Pennsylvania Coal Co. of Canada, Ltd.**, with headquarters at Toronto, has been granted Ontario incorporation with power to carry on business as coal operators. The authorized capital is \$100,000.

**Prudence Coal Co., Inc.**, Brooklyn, has been organized with \$150,000 capital to manufacture coke and byproducts. Henry Casali, New York City, Constantine Bergamini, Brooklyn, and Harry Aronoff, Brooklyn, are directors and subscribers. A. H. Kurland, 50 Court St., Brooklyn, is attorney for the corporation.

The **Manufacturers Gas Coal Co.**, capitalized at \$50,000, has been organized to operate in Brooke County, West Virginia. Headquarters of the company are to be at Wellsburg. Among those identified with the new company are J. J. Arnold, Washington, Pa.; John W. Conwell, Pittsburgh; W. H. Conaway, Fairmont; E. E. Carter, Wellsburg, W. Va. One of the incorporators, W. H. Conaway, has been attorney for the Josiah Thompson interests in West Virginia for some time.

The **Diamond Coal Co.** has been organized in Provo, Utah, with a capital of \$100,000, fully paid. The company will develop property in American Fork Canyon, Utah County. According to the promoters, the company's property in the canyon has a vein showing at least 6 ft. thick, with a fair promise of an increase as the tunnel is driven into the mountain. Incorporators are: T. E. Nicolodimos, John Blathran, Daniel Odysseis, Nick Tumbaras and Chas. G. Y. Higgins, the latter an attorney. All of the men are residents of Provo.

under the co-operative agreement of the state and federal surveys. The report is accompanied by county topographic and geologic maps.

**Eleventh Annual Report for Colorado**, by James Dalrymple, Denver, Colo., state inspector of coal mines. Pp. 94; 6x9 in.; tables.

The American Rolling Mill Co., Middletown, Ohio, has recently published a book of 185 pages entitled **Making Letters Talk Business**. It is a revision of two earlier books on correspondence produced by the company. The price is \$1.25 and the book measures 6x9 in.

Economic and Geologic Papers for the State of Illinois, comprising **Geology and Mineral Resources of the La Harpe and Good Hope Quadrangles**, by T. E. Savage and M. L. Nebel; **Geology and Mineral Resources of the Morris Quadrangle**, by Harold E. Culver; **Geology and Mineral Resources of the Kings Quadrangle**, by J. H. Bretz; **Geology of Northeastern Adams County**, by Louis W. Currier. Illinois State Geological Survey, Urbana, Ill. Bulletin No. 43. Pp. 338; 7x10 in.; illustrated.

## Recent Patents

**Coal Cutter**; 1,485,801. Matthew S. Moore and Herbert Jubb, London, England, assignors to Cowlshaw, Walker & Co., Ltd., London, England. March 4, 1924. Filed May 26, 1922; serial No. 563,970.

**Automatic Feeder**; 1,486,105. James A. Nolan, Bowerston, Ohio. March 4, 1924. Filed April 25, 1923; serial No. 634,618.

**Coal Cutter**; 1,486,529. Nils D. Levin, Columbus, Ohio, assignor to The Jeffrey Manufacturing Co., Columbus, Ohio. March 11, 1924. Filed March 31, 1921; serial No. 457,363. Renewed Aug. 6, 1923.

**Chain-Grate Stoker Link**; 1,486,987. John P. Polster, Toledo, Ohio. March 18, 1924. Filed Sept. 2, 1921; serial No. 497,872.

**Mining-Machine Bit**; 1,487,198. Newton K. Bowman, North Lawrence, Ohio. March 18, 1924. Filed Aug. 17, 1920; serial No. 404,108.

**Mining-Machine Bit**; 1,487,217. James F. Dillon, Crown City, Ohio, assignor to Newton K. Bowman, Bowdill, Ohio. March 18, 1924. Filed Sept. 16, 1920; serial No. 410,593.

**Mine-Car-Loading Device**; 1,487,573. Harry Ingram, Marion, Ill. March 18, 1924. Filed Feb. 9, 1922; serial No. 535,375.

**Tunneling or Mining Machine**; 1,488,066. Alexander Schmidt, Dorog, Hungary, assignor to Maschinenbau-Aktiengesellschaft H. Flottman & Co., Herne, Germany. March 25, 1924. Filed Dec. 30, 1921; serial No. 525,963.

## Obituary

Clarence D. Boyd, manager of the joint traffic office supported by the Southern Appalachian Coal Operators' Association, Harlan Coal Operators' Association, and Hazard Coal Operators' Exchange, at Louisville, died Aug. 29, following a ten-day acute illness of Bright's disease. He had been in poor health for several months. After many years connection with various roads Mr. Boyd resigned as general coal and coke agent of the Louisville & Nashville R.R. May 1, 1919, to establish the joint traffic bureau.

## Coming Meetings

**Association of Iron and Steel Electrical Engineers.** Annual meeting and exposition at Duquesne Garden, Pittsburgh, Pa., Sept. 15-20. Secretary, John F. Kelly, 1007 Empire Bldg., Pittsburgh, Pa.

**National Safety Council.** Thirteenth annual safety congress Sept. 29 to Oct. 3. Louisville, Ky. Managing director and secretary, W. H. Cameron, 168 No. Michigan Ave., Chicago, Ill.

**American Institute of Mining and Metallurgical Engineers.** Fall meeting, Birmingham, Ala., Oct. 13-15. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

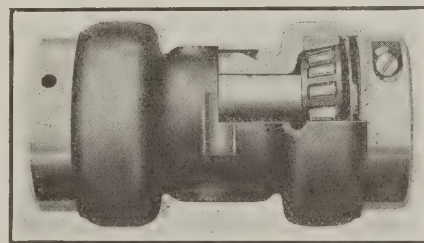
**American Institute of Electrical Engineers.** Fall convention, Pasadena, Calif., Oct. 13-17. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

## New Equipment

### Hanger Bearing Has Rollers Tapered to Meet Thrust

A new lineshaft bearing embodying the Timken tapered roller bearing, as well as several new features, recently has been placed on the market by the Dodge Manufacturing Corp., Mishawaka, Ind.

The bearing is a simple unit. There are only five parts to the complete assembly. It consists of two tapered roller bearings mounted on a ground and slotted steel tube and fitted to an accurately machined housing. The ends of the steel tube are threaded to receive clamping collars designed to afford accurate adjustment of the bearings on the tube. This adjustment is



Lineshaft Anti-Friction Bearing

Full utilization of the two bearings for radial and thrust loads is obtained by tapered races housed in this unit.

made at the factory and need not be altered by the user.

The mounting of the tapered roller bearings, as described, assures full utilization of the bearings for both radial and thrust loads. It also adds to the ruggedness of the assembly and is of particular value in resisting the side weave of heavy driving belts.

The method of fastening the steel tube or sleeve to the shaft permits of its use on any commercial shafting. This fastening is accomplished by simply setting up the screws in each of the two clamping collars.

The dustproof feature of this bearing is also of importance. The sleeve on which the bearings are mounted extends from end to end of the housing. Liberal grease compartments are provided inside the housing and outside the tube. The outer ends of the bearings are protected against dust by special metallic grease seals which eliminate friction at this point and positively prevent dust from working in or the lubricant from working out. These grease seals take the place of felt washers or packing.

The tapered roller bearing is constructed on the cone principle which insures a true rolling action. The bearing itself comprises four parts, a cone or inner race with outside taper, tapered rollers, a cage or roll retainer and a cup or outer race.

The cone, rollers and cups are made of electric steel. The rollers and races are heat-treated and each roller is precisely checked for size and accuracy

## Publications Received

**Twenty-Fifth Annual Report of the Mining Industry of Idaho for 1923.** Pp. 221; 6x9 in.; illustrated.

**The Geology and Mineral Resources of Wise County and the Coal Bearing Portion of Scott County, Virginia**, by J. Brian Eby, with chapters by M. E. Campbell and G. W. Stose. A chapter on the **Forests of Wise County, Virginia**, by Fred C. Pederson, also is included. Virginia Geological Survey, in co-operation with the U. S. Geological Survey and the Office of State Forester, Charlottesville, Va. Bulletin No. XXIV. Pp. 617; 6x10 in.; illustrated. This is the seventh of a series of detailed reports on the coal resources of southwest Virginia



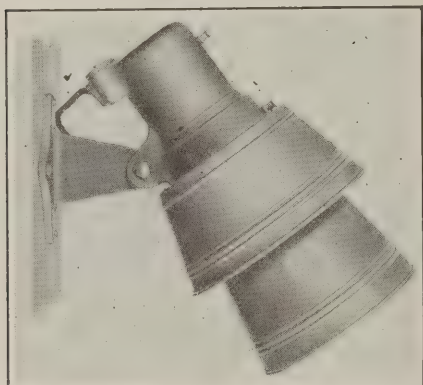
by magnetically operated automatic machines. The taper of the roller, which has to carry and adjust the end thrust is constantly checked during production by extremely accurate gages.

The assembly of this new lineshaft bearing is simple. It is only necessary to slip the bearing over the shaft and set up the clamping screw in each of the split clamping collars. It is easily removed by loosening the screws in the collars and slipping the bearing off the shaft.

### Moistureproof Siren

A new electric siren for indoor and outdoor service recently has been developed by the Inter-State Machine Products Co., Inc., Rochester, N. Y.

The fan or rotor is protected by a waterproof housing and a screen placed in the sound projector keeps out all foreign matter. The siren is positively



### Work and Emergency Electric Signal

This device is provided with a waterproof housing and conduit connection to exclude all moisture and dust.

waterproof and weatherproof and can be used outdoors without additional protection. The motor is inclosed in a substantial housing fitted with a conduit connection so that all wiring may be done in the most improved manner, leaving no exposed wires. The horn projector and waterproof housing are made from heavy gauge metal and finished with several coats of red enamel. A specially designed bracket of the swivel type is mounted at the base of the signal so that it can be located in any position and still exclude moisture.

This siren has been improved by the use of a large and more efficient motor, the bearings of which are lubricated by two accessible oil cups.

### Improved Pole-Top Switch

A new disconnecting switch for outdoor service has been developed by the Delta-Star Electric Co., Chicago. This unit is for multi-pole service where two or more elements are to be interlocked and operated either manually or by motor.

The switch consists of two rotating pillars with copper contact blades reinforced by heavy T-iron. One blade is provided with a sleet shield and the other a self-aligning contact. When the switch is closed these two parts are held together by contact springs.



### High-Voltage Line Switch

Both the insulator pillars on this switch rotate when the switch is either opened or closed. By this means the contact blades come together between self-aligning contacts under a sleet shield.

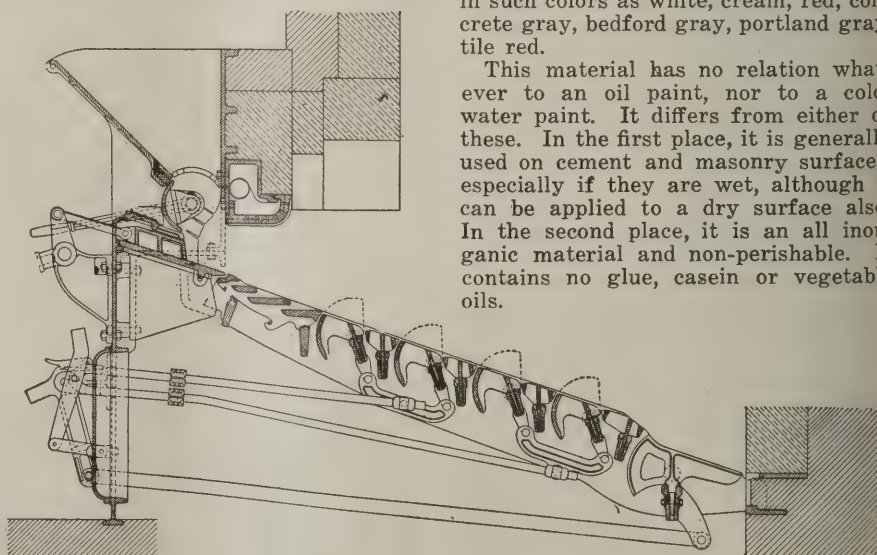
The blades of the switch rotate when being closed. This is accomplished by levers controlled from a special bearing mounted in the center of the switch base. Line wire connections are made to lugs fastened to a small bearing which easily rotates with the blades of the switch. All bearings are fitted for Alemite high-pressure lubrication.

### Hopper-Feed Hand Stoker Has Many Advantages

The McClave-Brooks Co., Scranton, Pa., recently announced a hopper-feed hand stoker suitable for application to hand-fired boilers in the mining field. This stoker has been designed for boiler plants where the owner is disposed to avoid the expense of mechanical stokers but nevertheless needs smokeless, efficient combustion.

The equipment consists of heavily designed hopper-feed fronts and heavily constructed divided kicker-movement grates, as well as extra heavy cut-out bars for the removal of the ash and special clinker shear plates. The specially designed pre-heated air arch is a distinct feature of this stoker.

Extending across the front of the furnace are coal magazines or hoppers of large capacity into which fuel may be introduced by chutes from overhead



### Side Elevation of Hopper-Feed Hand Stoker

The heavily constructed stoker arch is cooled by air driven through the arch. Consequently, this air is also pre-heated before passing through the coking area where it provides an extra supply of oxygen to help complete the combustion of the gases rising from the green coal.

bunkers, a traveling lorry or, if necessary, by hand. The large capacity of these hoppers is a distinct advantage in case the fuel supply should suffer a temporary interruption by clogged chutes or other causes. At the bottom of these magazines are located the coking plates which also extend across the front of the furnace and directly under the main arch.

Coal is deposited on the coking plates from the bottom of the hoppers or magazines and then is fed on to the inclined grates by plungers or pushers that always feed the same quantity at a push, thereby assuring a bed of correct thickness for various capacities. This action, which takes place with each movement or throw of the pushers, underfeeds fresh fuel to the fire.

### Paint for Wall Already Wet

Many people want to paint damp basements, damp concrete and masonry walls, damp building interiors, such as laundries, power-plant walls, etc., where there is an excess of moisture.

Every painter knows one cannot successfully paint a wet or damp surface. If the surface is thoroughly dry and the paint is good and the work is done in a workmanlike manner, a good job of painting, varnishing or enameling will stand much moisture. But it is different when an attempt is made to cover with an oil paint a surface already damp or wet.

The Truscon Laboratories, Detroit, Mich., have brought out a product for coating damp or wet masonry. In fact, it can also be used on wood, although it is preferable for masonry. This material is not an oil paint, as we all know that no oil paint has ever been made which can be applied to a damp surface. This material is known as a hydraulic paint. It contains no oil whatever. It is produced in powder form and mixed with water much after the manner of calcimine or cold water paint.

This material is known as Stuccotex. It is put up in convenient size packages in such colors as white, cream, red, concrete gray, bedford gray, portland gray, tile red.

This material has no relation whatever to an oil paint, nor to a cold-water paint. It differs from either of these. In the first place, it is generally used on cement and masonry surfaces, especially if they are wet, although it can be applied to a dry surface also. In the second place, it is an all inorganic material and non-perishable. It contains no glue, casein or vegetable oils.



# COAL AGE

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## Railroads Might Stimulate

### All-the-Year-Round Buying

**S**PASMODIC interest in the purchasing of coal during the summer is stirred up by various public bodies, and this is indeed well, but the delaying habit is so strong in the public that, if we wish to stir the buyer to continuous action, we need continuous advertising. The railroads are just as much interested as the coal companies, so why do they not advertise by putting a placard conspicuously in their waiting rooms, explaining that the interest of the consumer is to have an unfluctuating market to buy in without shortages and without gluts?

It should be easy to convey to the consumer the story that coal shortages cause prices of coal to rise as they also raise the prices of grain, and it should be easy to show him that both coal and transportation must be excessively costly when both mine and railroad have to be kept competent to do in a few months what could just as well be spread the year through.

Furthermore, it could be urged that a little more foresight on the part of the consumer would keep the miner and railroad employee steadily at work and would maintain a market for the manufacturer and tradesman throughout the year. The railroads, in fact, should advertise the value of steadying markets as helpful to everybody. The idea has not been sold. How could it have been, seeing that it has not been advertised?

## John and Warren Wrangle

**T**HIS monkey-and-parrot time of it that John and Warren are having amuses us. Here is Warren, president of the Brotherhood of Locomotive Engineers, a powerful and normally sane labor union, trying to run a labor-owned coal company down in West Virginia on a business basis—which means he wants to produce coal at wages that will permit the company to break even or maybe declare a dividend. And here is John, president of the United Mine Workers of America, lambasting him for doing it. What Warren ought do with his union-owned Coal River Collieries, if he can't run them without loss at the high wages dictated by John at Jacksonville, is to do it anyway, and hand out to miners the engineers' investment of \$3,000,000 as long as it lasts. That's the way to run a business. Any union mine official will tell you so.

But this labor union, the Brotherhood, has been learning something about competitive business during the last few years. It has been running a bank for one thing. Of course, that may not have been as competitive as some enterprises, partly because a large volume of depositors and investors was guaranteed before the bank even opened its doors. But it was sufficiently competitive so that Warren and his fellow engineer bankers didn't invest much of the money in pure altruism.

When John asked for a big miners' strike loan in 1922, for instance, secured only by John's name in bold black ink, Warren said, No. He wanted to make the loan on a business basis or not at all. He was in the banking business and the bank had to work for what it got. This made John mad. Also it made John pretty mad to think the decently-paid engineers would not quit work and tie up the railroads to help the miners win their strike; but that is only incidental to the present hot time between John and Warren—oh, purely incidental!

And then Warren and the boys who pull the country's throttles bought the Coal River properties. They paid the union scale and tried their best to make the thing go. They probably did everything humanly possible to make it a success on a union-scale basis. But they were in business, and they found that economic forces sometimes cannot be met with thunderous phrases about "no backward step" and the like.

Maybe John can get by that sort of thing, as his income is all collected for him from his own rank and file by the coal operators, no matter whether the rank and file thinks it is a good investment to make or a punk one. But Warren had to get his money in a business. So he told his union miners the jig was up. Either they worked for enough less to make it possible for him to stay in business or down went the mines and nobody worked. So the mines were closed down. Warren at least wouldn't reopen non-union. John ought to give him credit for that.

But John doesn't credit him with anything much, except with "joining other coal operators of West Virginia in an attempt to starve the employees into acceptance of a wage reduction." This is "an intolerable position for a coal company whose stock is largely owned and whose affairs are directed by union men." However intolerable it may be, the locomotive engineers still have the \$3,000,000 they invested in the Coal River Collieries and are probably in position to earn something on that investment if they ever get a chance to run their mine on a business basis. But the fact that they recognize the economic law of supply and demand certainly riles John.

## Summer Coal

**A** GREAT wonder to American tourists who visit Europe during the winter is the extreme coldness and discomfort of the houses heated by inadequate grate fires in front of which one must turn like a spit in order to be toasted on both sides. The reason probably for the meager heating is that the winters are so moderate that the problem of house warming never had to be settled right. Whether that is the real reason one cannot say. Certainly it has never been rightly settled—at least not in Europe.

But while we wonder at Europe freezing in the winter, have we not reason to marvel at the way in



which America swelters in summer? The captain of industry finds his home and his office unbearably hot. He discovers that he must take a long vacation to the mountains, at the shore or in his yacht. If he stays in the city, he gets nine kinds of stiff neck from the fitful breezes of his office fan, which disturbs his papers and delivers to his desk the dust-laden air of the city street.

We have borne with this nuisance so long, however, that it never seems to occur to us that we could have rooms regulated by a thermostat to any degree of heat. We could cool, clean and move the air so that it would give us comfort and allow us to retain all those habiliments that go with dignity—coats, vests, collars and cuffs. Why should not comfort in the summer be as important as in the winter? The Englishman with his draughty house and bucketful of glowing embers is not more sad than your American with wilted collar, perspiring forehead and stiff neck. Some day we shall rise to a superiority over the rises of the thermometer as we have over its downward plunges.

What temperature shall we endeavor to attain? That is a matter for determination. Perhaps ten or fifteen degrees below that of the outside air—a temperature high enough not to chill us on leaving the street but cool enough to keep us active and capable of performing a good day's work, despite the heat. At night we shall sleep and gain strength for the morrow's toil instead of fitfully tossing and watching the passing hours.

The problem of conditioning air is not a new one. In a deep metal mine, the St. John del Rey, the miners are being supplied with artificially cooled air. In many hot American metal mines large volumes of air are being circulated for the purpose of reducing the temperature. The work of the miners is greatly increased by the change, so much so that the companies recognize ventilation as a source of extremely valuable economies. In the textile factories the air is regulated but rather as to its moisture than as to its temperature. If such provisions are made in industry why should they not be provided for comfort?

After a while the electric companies will be buying coal to provide for the demand for summer ventilation and for the operation of air-cooling water sprays. Where ammonia is used, the householder will be using coal to operate his private refrigerator plant and we may find ourselves questioning one another: "Have you bought your summer coal?" Coal men will miss an opportunity if they fail to awaken the public to the advantage of conditioned air.

### Manufactured Fuels Filling Need for Smokeless Coal

ONE POTENT phase of the fuel situation is becoming increasingly important from year to year. This is the production of smokeless fuel. Heretofore the really smokeless coals, so far as the ordinary householder is concerned, have practically all come from the anthracite region of Pennsylvania. The limits of this field have been established with a fair degree of accuracy; both the quantity of coal mined and that yet left in the ground have been computed closely. It may be stated with a reasonable degree of certainty that the anthracite deposits of Pennsylvania will be exhausted within the course of approximately the next

century. Long before that time has arrived the country must have developed a satisfactory substitute fuel.

Though there is doubtless room for improvement in existing anthracite substitutes, nevertheless several such fuels have already reached a fair degree of perfection. The most common of these is probably coke, either byproduct, beehive or gas-house. This fuel being bulkier and more porous than coal must be treated in the ordinary house furnace somewhat differently from anthracite. As it burns with an intense local heat it is liable to warp the firepot of a house furnace unless this is surrounded with water. Its use is most successful in steam and hot-water furnaces.

Of the various other substitutes only two as yet have become important—gas and briquets. Gas possesses the advantage not only of being smokeless, but also of being ever-ready and requiring no kindling for its ignition. It is probably the most convenient fuel known and makes a fire that may be readily controlled throughout its entire range of heat-generating possibilities.

Briquets were at first regarded by the average householder with more or less suspicion. Although those first made in this country were of somewhat doubtful quality, the later product has been much improved. Today it is entirely possible, through a proper heat treatment of the briquet after pressing, to obtain a fuel that is at least as smokeless as anthracite, even though the coal from which it is made is rich in bitumen and consequently decidedly smoky when burned raw in an ordinary furnace.

In making a smokeless domestic fuel from a high-volatile coal it is quite possible to recover certain byproducts which in some degree at least tend to pay for the manufacturing process. While it is a comparatively easy matter to enforce local smoke ordinances against the big industrial plant, it is an entirely different proposition to enforce the same regulations against the small householder, whose name is Legion. It would seem therefore, that our cities will not be devoid of smoke until a smokeless fuel is not only available to the ordinary householder but until it has become economically advantageous for him to burn such fuel in competition with raw coal.

Briquets meeting with the most ready sale today are those either manufactured from fine anthracite or from bituminous coal which has been so heat-treated as to drive off practically its entire content of volatile matter. In treating the highly bituminous coals, with which nature has so richly endowed North America, in such manner as to render them smokeless, in addition to various byproducts, two excellent fuels, both of which readily burn to carbon dioxide and water vapor are produced. Thus while raw soft coal can be burned smokelessly only with difficulty gas and coke or heat-treated briquets may be burned to invisible vapor without appreciable hindrance.

This country's supply of bituminous coal is almost limitless; its store of naturally smokeless coal must soon be exhausted. Already several processes are available whereby excellent smokeless fuels may be made from inferior natural products. The use of these fuels must naturally increase from year to year. Fortunately, smokeless manufactured fuels—coke and briquets—are superior to the natural product in heat content. Furthermore as a rule they contain less ash.





Mud Sprayer in Action

## Is Mud Equal to Rock Dust For Mine Protection?

Utah Superintendent with Plenty of Air-Slacked Shale at Hand Saves Grinding Costs by Mixing Dirt with Water and Spraying It Through Rooms and Entries from Home-Made Pumping Machine



Mud-Sprayed Heading

**W**HY not "mudize" a coal mine instead of rock dusting it? If the same degree of safety from coal-dust explosions can thus be attained at one-fourth the cost and with greater ease, then why not do it? Many a coal-mining man in the Rocky Mountain regions has been asking himself these questions since the idea of "mudizing" was conceived by W. J. Reid, superintendent of the Lion Coal Co.'s mine at Wattis, Utah. If air-slacked shale, adobe or other easily friable clays can be mixed with water and effectively sprayed on coal-mine roofs, ribs and roadways, is there any good reason why a mining company with such material available should go to the trouble and expense of pulverizing hard rocks or shales for the purpose?

As yet nobody knows positively that the new mud process is as efficacious as the better known fine, dry rock dust. Even Mr. Reid, who is better informed than anybody else, being the only man who has done the thing extensively, cannot be positive; his mudized territories have never met the test of a spreading mine explosion. Although pretty well convinced and unable to see any good reason why the scheme should fail, he is trying his best to prove or disprove the theory. Right now he is running a series of tests in a 50-ft. length of corrugated iron pipe such as is used for storm culverts under highways. He is mudizing sections of the interior of this pipe to see whether coal-dust explosions will jump the protected areas. Also he is figuring up every other kind of trial he can think of, short of a mine explosion, to determine just what effect the mud will have under all circumstances.

His mudizing idea is attracting widespread attention, as is his patented mud-spraying machine for mine use, which is still in the development stage. The mine inspectors of Utah have not yet put their stamp of approval on mudizing, but they are watching it closely. Since rock dusting is required in Utah under the new state mine safety code, it is difficult to say whether mudizing can be interpreted to mean rock dusting; but nobody is putting anything in the way of proving out

the idea and eventually it may be accepted as standard rock-dusting practice.

Mr. Reid says the mudizing idea dawned upon him while he was watching a machine shoot cement onto outside wooden construction to render it fireproof. If cement at so much a hundred pounds was a protection against fire, why wouldn't ordinary air-slacked Utah shale, mixed with water, do just as good a job at next to nothing a hundred? The hills all around the Wattis mine are full of the right sort of dirt. In fact, at one point close to the tippie, at the bottom of the long tramway that brings the coal 1,000 ft. down the mountainside from the mine, a bank of this dirt located in a small cut constantly sloughs off and slides down over the track. It has to be shoveled away and is a constant harrassment. Why not see if it could be put to use?

A little of this dirt was shoveled through a screen to remove broken rock and the coarsest of the material. Then it was mixed with water and put through the gunning machine. It stuck to the woodwork splendidly. But did it really fireproof the wood? To find this out, Mr. Reid picked up some broken pieces that were thoroughly covered and carried them home. Into the cookstove they went while a hot fire was burning. He let them lie there for several minutes and then lifted the lids, wondering whether he would see wood ashes to mark a failure of his idea.

### MUDIZED WOOD NEARLY EXTINGUISHES COAL FIRE

The sticks of mudized wood not only lay there unburned; they had almost put out the coal fire itself. So in this way, at least, the method was effective.

The next day a scheme for mudizing the whole wooden weighhouse and tippie went into effect. A shortage of water in the region at the time made it advisable to render the tippie as fireproof as possible and it was done with just plain mud from the mountainside. To-day that wooden tippie is plastered with it, and the Lion Coal Co. expects no loss by fire.

Thence the idea spread to the mine. If mud worked well in the tippie it ought to be good protection against

### MUD VERSUS ROCK DUST

Not any too much is known yet about "mudizing" mines; but from present knowledge it seems that such mining companies as have available a supply of the right kind of dry, loose clay or air-slacked shale certainly can shovel it through a screen into a tank full of water and spray the resultant mud through rooms and entries much cheaper than they could rock dust the same areas. The mud has other advantages that rock dust hasn't, as explained in this article. But there is one big main question yet to be answered: Will this mud stop an explosion that has been initiated elsewhere? It is evident that the mud, when it has thoroughly dried on roof ribs and floor, presents a slightly dusty surface. But it remains to be proved whether this is dusty enough. In any event, many mining men are watching Superintendent W. J. Reid's work with interest.



the inflammability of coal dust. So Superintendent Reid went to work on the problem of mudizing the mine.

He devised a crude machine mounted on a mine-car truck, in which dirt and water could be mixed and pumped by a centrifugal pump through a peculiar flat nozzle that produced a well-divided spray. With this device mud was plastered through considerable lengths of entry. Many changes have been made in the machine from time to time and much experimenting has been done to learn just what the paces of the device are. Thus



Close-up of the Mud Slinging Tank

The machine, which is self-propelling, bears a tank 10 ft. long and 4 ft. wide capable of holding a ton of shale dirt in a one-to-two mixture of water. A 20-hp. motor, drawing power from the trolley line, drives the truck and runs both the stirring paddle wheel which keeps the mud in suspension and the centrifugal pump which sprays the liquid through the nozzle. The mud is delivered onto a fan-shaped plate and is deflected by blades set on the face of the plate. It costs but 50c. a ton to load this machine for service and with it one operative can cover from 2,500 ft. to 4,000 ft. of entry 20-ft. wide in a day.

far the Lion Coal Co. is eminently satisfied with its performances, and the Wattis mine will soon be mudized from portal to rooms.

The mud is first shoveled from the thoroughly slacked face of a shale bank near the tippie. It goes through a twenty-mesh sand screen directly into a pit car and is then ready to be hauled up the tramway to the mine. The cost of this "preparation" probably is not over 50c. per ton. This is far less than the total cost of producing and grinding ordinary mine shale.

About a ton of the material is loaded from the pit car into the tank of the mudizing machine with water in the proportion of about three to one by volume. The mixture is kept constantly stirred by the machine and is discharged by the pump through the nozzle as the machine runs slowly through the mine under its own power.

The average application varies in thickness from  $\frac{1}{4}$  to  $\frac{1}{2}$  in. The liquid seems to penetrate perfectly into cracks and crevices and to effect complete coverage of all exposed surfaces on roof and ribs. Though the angle of deflection from the fan-shaped nozzle is such that the mud does not strike directly upon any mine surface lower than a line 30 in. or so from the floor, the ribs below that line are well splattered and the roadway is heavily encrusted.

#### MUD SPRAY WASHES DUST DOWN

The first effect of the spray is to wash down all the coal dust that may have accumulated on roof and ribs, leaving the layer of pure shale. The value of this is apparent when it is remembered that by this process practically all inflammable accumulations in the entry are carried to the floor. And on the floor it is deposited as a thorough—and presumably non-explosive—mixture

of coal and shale instead of in super-imposed layers of coal dust and rock dust.

Of course this caked layer of mixed material on the roadway is partly broken up by travel, especially close to and between the rails, and it might be said that in this manner the coal dust might be brought to the top in a dangerous film.

A careful examination of this floor material, after it had dried thoroughly, indicated, however that in the pulverizing process the shale breaks down to the same talcum-powder fineness as the finest coal dust and that therefore the shale on the roadways should always be ready to fly into suspension with the coal dust under the force of any rush of air such as that which precedes an explosion.

Over part of a roadway surface, where the floor is little disturbed, however, the mud and the coal dust remain caked together in what is probably non-flammable form. A virtue of this caking is that mine sanitation is much improved. Such manure, offal or other organic matter as might be deposited throughout the mine is effectively sealed over.

The plaster of mud on roof, timbers and ribs in the Wattis mine has the light color characteristic of average mine shale—even a little lighter, perhaps—and therefore possesses all the advantages of illumination which are lent by shale dusting.

The appearance of creep in the roof or ribs is easily detected. New cracks probably will show up more plainly than they would in entries that had been dusted with dry pulverized rock because of the sharper delineation of the edges of the crack. Thus the men in the Wattis mine feel that they can more readily detect a developing case of bad roof.

Mr. Reid also thinks that bottom heaves in clay are delayed or prevented by the liquid spray. The stuff is applied in such thin liquid form that deep cracks are filled and a mine bottom is so thoroughly sealed from the air that some causes of heaving are eliminated.

#### MUDIZING REDUCES DUST ACCUMULATIONS

Naturally the main interest in mudizing centers in the question: Will this mud stop the spread of an explosion? In order for it to do so it probably must present a dusty surface bearing enough finely divided shale dust, ready to be blown into suspension, so that the work of loose rock dust may be accomplished. The only answer to the question is this: The mud dries in about 36 hours, or 48 hours at the most. When it is dry, the coating on roof and ribs offers a chalky surface from which dust can be rubbed in a thin film with the finger tips, but nobody knows definitely whether there is enough of this fine shale dust to stop an explosion.

It is worth noting that the mud, when it is first applied, fills even the finest cracks and the most minute niches. While the larger depressions and ledges in roof and ribs are not poured full, they at least fill out flatter and flatter with each succeeding application so that the tendency of the mudizing process is to reduce the opportunity for fine coal dust to accumulate.

"But only a trifling accumulation is necessary in order to make a mine dangerous," say the numerous critics of mudizing, when they first hear of it. "No mine can be prevented from spreading dust about on the air and through spillage from cars. And what if this accumulation is piled up between trips of the spraying machine? Is your mine safe, then?"



"Well," reply such defenders of the scheme as P. H. Burnell, operating head of the Lion Coal Co., "The thing to do is keep your working places mudized right up close, use lots of water at the actual face and make your cars tight. Then you will have reduced the danger of dust accumulations to the lowest point. Nothing is perfect, but it seems to us that if you do those things you get pretty close to perfect mine protection against dust."

One other point is worth discussing with regard to the possible action of mud with a passing burst of flame. The caked layer of dirt, once thoroughly dried in the mine, is compact enough to adhere closely to roof and rib surfaces, but it will pulverize easily between the fingers—so easily, in fact, that it seems probable that the heat and force of an explosion traveling through an entry might easily reduce a part of the layer to finest dust which would be blown into suspension and thus participate in subduing a coal-dust fire in the recoil if not in the initial blast.

#### ECONOMY OF SCHEME IS OUTSTANDING FEATURE

A most attractive feature of mudizing as it is now practiced at Wattis is its economy. The dry dirt—a sort of air-slacked shale—costs but 50c. a ton at the mine portal, ready for the tank of the spraying machine. Power is a small item, for a 20-hp. motor operates the entire unit, supplying power for travel, for agitation in the tank and for spraying. One man operates the outfit. The machine should travel about 100 ft. per minute when it is spraying and the experience of the Lion Coal Co. is that it can easily cover 2,500 ft. of entry a day, allowing for all sorts of delays short of actual breakdown. An average day's work might cover 4,000 ft. of entry.

Mr. Reid cannot help comparing this performance with that of men sprinkling with water. In the Wattis mine a man equipped with a length of hose, whose job it was to proceed from hydrant to hydrant, washing down the mine, almost never covered more than 1,000 ft. in one entire day. Furthermore, it often was possible for him to assert that he had sprinkled sections he had never entered. But with the mudizing machine the evidence is so plain that no operative ever can allege more than he actually has done. In other words he must do his full stint or show good reason why. And the capacity of the machine is three times that of the ordinary sprinkler at one-third the labor cost. A tankful of the mixture will cover 800 ft. to 1,000 ft. of 20-ft. entry. Of course this distance will vary with the size and condition of the roadway and should be greater than 1,000 ft. on repeat coatings.

At intervals through the mine it is necessary to have a supply of the dirt ready for the machine. As the material makes good stemming, piles of it are dumped in rooms. This leaves it handy for the machine when it is working in room entries and keeping up with the advancing faces. But the main supply is hauled into the mine in pit cars and spotted along the route that the machine is scheduled to follow in each tour. The process of recharging the machine is simply one of shoveling dirt into the tank from a pit car on a parting and of filling up the tank with water from the lines, which are necessary in all mines of Utah under the state code.

The self-propelling machine which Superintendent Reid devised, but which is being replaced by an im-

proved type, consists of a tank 10 ft. long, 4 ft. wide and 16 in. deep made of sheet steel and angle iron. The entire top comprises three lids easily removed. The bottom of the tank pitches slightly from both ends to the middle, where an agitator paddle wheel bearing eight spokes revolves constantly above a 2-in. outlet pipe which feeds the mixture by gravity down to a centrifugal pump under the tank. The pump discharges the liquid through a pipe of 1½-in. diameter to an outlet on the apex of a fan-shaped steel pan nozzle. This



Canyon Down Which Lion Tramway Passes

The tramway can be discerned on the left side of the valley. At places along the roadway is found the fine weathered shale that is turned into mud by the rains and is used by Mr. Reid to mudcoat his entries and return airways. Mr. Reid cleans his tramroad of fine detritus and turns it to good use by covering his headings with it.

fan-shaped plate, elevated at an angle of about 45 deg. from horizontal, bears on its face an arrangement of blades standing on edge, so curved and placed as to deflect the mud spray correctly. The spray is further aided by an upturn around the rim of the plate.

The motor, mounted under one end of the tank and operated from the line through a trolley pole, drives the truck, agitator and pump. It operates at 860 r.p.m. and transmits power to a main vertical shaft through a four-to-one bevel reduction gear. Further speed reduction in the transmission of power for locomotion is accomplished by a steel worm on the lower end of the main shaft engaging a bronze wormwheel on the drive shaft. A sprocket and chain connect the drive shaft with one of the truck axles, affording the desired travel of 100 ft. per minute. Another set of sprockets and a chain on the opposite side of the truck make the drive four-wheel.

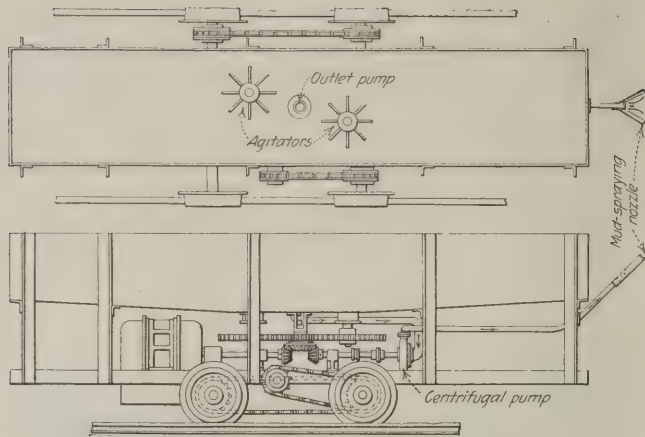
#### AGITATOR RUNS CONTINUALLY

The agitator in the tank is driven at 107 r.p.m. through a gear reduction from the main shaft. It revolves all the time the motor runs, though the truck may be stopped or the pump halted at any time by a shifting of gears. This constant agitation keeps the mud in the tank from settling and choking the pipes and thereby eliminates any likelihood that the pump, becoming clogged, will break. The pump is driven at 1,720 r.p.m. through a speed-increasing gear and shaft equipped with a flexible coupling to absorb shock.

The new type of Reid machine will have two agitators, one whirling on either side of the main feed pipe leading to the pump. The single paddle wheel did fairly well but in the 10-ft. tank too much mud was precipitated at the far ends.

In the experimental work with the Reid machine all sorts of places in the mine were mudized. It was recognized that a machine on a track cannot reach every opening in a mine that needs rock dusting and some





Detail Drawing of Mud Sprayer

The agitators prevent the precipitation of the mud, being kept at work even when the pump is not operating. As the dust with which the water is mixed is extremely fine it is kept in suspension with a minimum of agitation. By using two agitators the dirt even at the car ends shows little disposition to settle.

## North Carolina Mines May Have Byproduct Ovens

BY J. H. ROSE

Erskine Ramsay Coal Co., Cumnock, N. C.

THE two mines in operation in the Deep River coal field of North Carolina are located approximately six miles northwest of Sanford, the coal field lying in Lee and Chatham counties. Deep River flows through the field in a generally northeast direction. It is traversed in a northwesterly direction by the Atlantic & Yadkin R.R. between Raleigh and Charlotte, and it is within convenient reach of the Seaboard Airline Ry. that passes through Sanford. A branch of the Atlantic Coast Line comes into Sanford and connects with the Atlantic & Yadkin at that point.

The strategic location of this coal field in relation to a large surrounding steam-coal market is unusually favorable. It lies 180 miles east of the great Appalachian coal regions. The coal occurs in the Triassic or New Red Sandstone formation, in the shape of a long synclinal trough, having a northeasterly direction. Tracing the coal seam from the outcrop to the diamond-drill holes shows the measures to be pitching on an average of 8 deg. At the bottom of the Farmville slope the measures are pitching 3 deg. The main slopes driven off from the Cumnock shaft are now showing the measure to be pitching 10 deg. The two mines (about a mile apart) and exposed surface measures overlying the coal indicate a large acreage of comparatively flat measures.

### FIELD MAY COVER 25 SQUARE MILES

The rocks consist of sandstone, shales and fireclay, with some interbedded coal seams extending over a limited section. A section of the coalbearing measures, as shown by the mine operations at Cumnock and Farmville is set forth in Table I.

Records of diamond drillings and mine operations have proven approximately 4,250 acres of workable coal, definitely in the field. A strange geological freak will be developed should the exploration proposed fail to prove up from 10,000 to 12,000 acres of workable coal in addition to the 4,250 acres just mentioned.

The coal-bearing strata contain a number of coal seams of varying thickness and quality. Only one of

attention had to be given to the trackless entries and aircourses which every mine has to watch. Dry rock dust can be blown into intake air with good results but mud can hardly be distributed in that manner.

To meet this difficulty Mr. Reid and his men used hose between the machine and spraying nozzle. At first they tried only a 50 ft. length. The results were so good that they added more and more hose until finally they were using 300 ft. and were able to spray 50 ft. beyond the end of the line. They believe they can use as much as 500 ft. of hose and still get sufficient pressure from the pump to spray mud successfully, although it may be necessary to thin down the mixture.

Thus they are perfecting the mudizing idea at Wat-tis. They may not have it worked down to a fine point, but they feel that they are approaching this stage. It is possible that they have gone far enough already to reduce greatly the cost of dust protection in those mines which have available a supply of dust material of the proper quality for this work.

these seams is commercially workable—it being known as the "Four foot" seam. It occurs at the top of the coal-bearing strata. However, tests are now being con-

Table I—Coal-Bearing Measures, Deep River Field, North Carolina

Sandstone cap rock	10 to 14 in.
Draw slate	2 to 6 in.
Coal ("Four ft." seam)	37 to 54 in.
Blackband ore	15 to 18 in.
Low-grade coal	20 to 30 in.
Fireclay, slates, shales	25 to 35 ft.
Blackband	2 to 3 ft.
Coal	24 to 32 in.
Blackband	18 to 34 in.

ducted as to the possibility of utilizing the low-grade coal for mechanically fired boilers for steam standby power plants operated by the larger power companies located in the state. A recent analysis, made by the state geologist, of the coal is given in Table II.

Dependable records of coal cuttings made and diamond drillings, indicate an average thickness of the "Four foot" seam, of 42 in. exclusive of 2½ in. of bone coal underlying the seam.

The large power companies in the state are exhibiting much interest in the possibility of locating a byproduct plant at one of the mines and have engineers in the field

Table II—Analysis in Four-Foot Seam, Deep River Field

Moisture	1.15
Volatile Matter	24.89
Ash	5.64
Sulphur	3.17
Fixed Carbon	57.03
B.T.U.	14,230

working in conjunction with the coal companies. The coal yields large quantities of illuminating gas, ammonia and coal tar.

Both mines are being rapidly developed and by the end of this year a production of 600 tons per day is anticipated for the field, the combined production of the mines at this time being 300 tons per day. The market for this coal far exceeds the production and a good price is realized for the coal during the entire year. Neither mine lost a day's time during the past eighteen months on account of no market for coal.



# Germany's Return to Honest Money and Economy Marked by Speedy Recovery

BY E. J. MEHREN

Vice-President, McGraw-Hill Co., Inc.

**N**O COUNTRY in the world today is, from the economic viewpoint, so interesting as Germany. She occupies the spotlight in Europe. What is to be her future?—is the question that everyone in the old world is asking.

The answer to that question no one can tell. The problem is complicated. But this even the casual visitor to Germany can say: *Germany has made tremendous strides since the war; she is showing extraordinary recuperative power—against tremendous handicaps; she has worked a financial miracle since November of last year; and, finally, no nation that shows Germany's potential strength can be permanently kept down, can be crushed.*

These observations, let me repeat, even the casual visitor must make. The signs are written everywhere: in a people again well nourished, in a public administrative ability (irrespective of party) that was able without new revolution to stabilize the currency, in a returning hope that Germany can again rise. There is not buoyancy of spirit, but there is a deep-founded confidence that the nation is not going to pieces.

The situation is in sharp contrast to what one expects. In America we hear of the wrecking of the currency, of the sufferings of last winter, of the difficulties under which her industries labor in securing raw materials and finding markets. Upon these reports—which of course, are correct—we paint with our imaginations a country on the verge of despair, a disrupted industry, a tottering government. The surprise is a great one—and, if one is fair-minded, he must come away with deep admiration for what has been accomplished.

Let us briefly paint the picture of Germany's economic circumstances:

Under the Versailles treaty or as a result of it she lost heavily of her iron and coal deposits—in Alsace-Lorraine, the Saar and Upper Silesia; she lost her colonies, her foreign investments, her shipping, her export organization and its connections; she has a large part of her territory under the control of her former enemies. In addition she has been through an exhausting war and political revolution.

These conditions are not new; they existed when I was in Germany just four years ago, in the summer of 1920. The result was what might have been expected—an under-fed, discontented people, a disorganized industry, and an all-pervading discouragement, unrelieved by any ray of hope.

Since then, since 1920, two other financial disasters have forced themselves into the picture—the occupation of the great industrial district of the Ruhr, and the wrecking of the currency.

With these added calamities one should logically expect that conditions

would be worse instead of better, that the despair would be even blacker than before.

And yet conditions are as I have described—immeasurably better. Here is a nation on the up-grade, rather than the down. Here is a nation to be reckoned with economically, not to be ignored; here is a nation that is sure to be an important factor in the world's industry.

This last is a bold statement. I realize what terrific handicaps the rest of the world can put upon Germany if it wishes. It can keep Germany impotent, but it is my belief that it will not do so. Sentiment, moreover, will play no part; commercial considerations alone will lead to trading with Germany. Other nations will want to sell to the markets of a reviving Germany. If they sell to Germany, they will buy from Germany, and if they buy from Germany, a prominent place in world affairs is assured her by the potential strength she is now so conspicuously displaying.

Let it be clearly understood that the path of recovery for Germany is not an easy or a quick one. She is not out of difficulty. The economic handicaps recited above are still upon her; some of them are being slowly removed—such as the absence of shipping and foreign commercial connections; some of them—such as the lack of colonies—may never be removed. But a nation that under present handicaps has recovered as she has done will rise despite the obstacles that a commercially minded world is likely permanently to place upon her.

## THE TURNING POINT

The great German economic miracle was wrought in the closing months of 1923 and the early part of 1924. Early last autumn Germany truly, to use the words of Basil Miles, administrative commissioner for the United States in the International Chamber of Commerce, was at the cross-roads. Directly ahead—on the road she was traveling, the road of unbalanced budgets, of state subsidy of the railroads, of currency debasement—was revolution, industrial suicide, destruction. To the right was a stormy path, extremely difficult, beset possibly by disorder, possibly by revolution, but leading, if the difficulties could be mastered, to economic soundness. It was the road of a stabilized currency, with its accompaniments of balanced budgets and governmental economy. Germany chose to go to the right, to take the difficult road, to bear the stress of financial reform and currency stabilization. She did it at a time, too, when the situation in the Ruhr was at its most critical stage, when strong forces were seeking to pry loose the Rhineland and erect it into an independent state, when the attitude of Bavaria toward the rest of Germany was much in doubt. But she

went on, nevertheless. The government declared that the mark should be stabilized at four trillion 200 billion to the dollar. There was a severe contest with the mark speculators, but by severe measures the government won. and since November, 1923, legally, and about Jan. 1, actually, the rentenmark has stood at 23.8c. to the dollar. There was no revolution.

Germany is beyond the cross-roads and has chosen rightly. The future is long and difficult, but there is health where there was disease, there is hope where there was despair.

The severest present industrial handicap is lack of credit. The great credit reservoirs were nearly or entirely wiped out by the fall of the mark. Further, there was no incentive to save; industries and individuals converted the tobogganing mark into goods as quickly as possible. Today the credit resources of the banks are estimated at one-tenth the pre-war amount. When credits are obtained the interest rate is 2½ per cent per month for the very best security.

Wages are at approximately pre-war level. Prices, as of July 15 (according to the *Frankfurter Zeitung* index, the highest index I could find and which takes in ninety-eight commodities) are 34 per cent above 1913. (The government's index for wholesale prices is 12 per cent above 1913.)

Efficiency of labor has increased notably and is still increasing. I heard no general complaint against the working man in Germany as I did in England.

Unemployment, while fairly large just now, is not as great as that of Great Britain, and does not present the all-engrossing problem in Germany that it does in the British Isles.

The works councils, elected by the workers, are said by the employers to be a good influence. They help smooth out difficulties and, in general, have not been radical.

Hours of work per day are increasing.

The coal supply, which by its shortage was expected to be for many years a serious handicap to German industry, is now more than ample, on account of the very large development of lignite deposits.

The heavy taxes imposed on industry and individuals are beginning, under the stabilized rentenmark, to yield a good revenue. Recent figures show a surplus that has been used to retire obligations.

There is much more to be said and the details just given need elaboration. But these few particulars will help to fill out the picture as I saw it—the picture of an industrial nation again on a sound basis, well organized, confident that somehow it will work out its difficulties and play a part in the world of industry and commerce.

Berlin, Aug. 13, 1924.



## Nation Is Using Less Coal as It Finds Price Too High

With Same Coal Railroads Give Eighty per Cent More Service—Utilities Make Coal Go Twice as Far as in 1915

By F. C. HONNOLD

Secretary, Illinois Coal Operators' Association  
Chicago, Ill.

**W**HENEVER clothing or any other personal or household gear advances greatly in price, we are all more careful both of the purchase of such items and in their subsequent use, making every effort to prolong their life and serviceability. The same is true with respect to food. When times are flush and we have plenty of money, it is our natural inclination to buy other things than necessities and to indulge ourselves in luxuries to a possible point of outright extravagance. When times are hard all such items are eliminated and we begin to consider the need of not only confining ourselves to actual necessities but utilizing, wherever possible, the lower priced offerings.

Just such a situation has arisen with every coal-consuming industry in the country as a result of the steadily advancing price of coal during and since the war. In 1915 the railroads of the country used, in round numbers, 106,000,000 tons of bituminous coal and during that year hauled approximately 275,000,000 ton-miles of freight. With the much greater volume of business done in those years, the quantity of coal used by the railroads in 1917, 1918 and 1920 varied from 133,000,000 to 135,000,000 tons each year and with an average cost approximately twice that paid for engine fuel in 1913.

As a result, every device both in the way of change of equipment and more economical use of fuel by employees was introduced. The net result of these efforts is to be found in the published figures of the Interstate Commerce Commission for the calendar year 1923. In this year the railroads carried the heaviest tonnage they had ever handled in any previous year of their history, amounting to the astonishing total of revenue and non-revenue freight of 457,000,000,000 ton-miles—almost twice the service rendered in the year 1914. Despite this showing, their use of coal amounted to only 109,000,000 tons, barely 3,000,000 tons over their use in the year ending June 30, 1915—an increase of only slightly over 2 per cent in coal used as against 80 per cent increase in tonnage hauled. Nor was this accomplished through substitution of other fuel. The use of oil at the present time constitutes only about 8 per cent of the total fuel requirements of the railroads and has shown an increase of only about 2 per cent in the past three or four years.

As another illustration of the effect of increased cost of coal, we note the rapid growth of the so-called super-power plants—public utilities providing electric energy for sale through a large territory and for a wide variety of uses.

Going back to the period slightly before the war, say 1915 and 1916, a kilowatt-hour of power was generated from the consumption of about 5 to 6 lb. of coal, some specially inefficient plants using as much as 10 lb. By 1919 a kilowatt-hour was being generated by 3.2 lb. of

coal, and in 1923 the coal used per kilowatt-hour had been reduced to 2.4 lb. At some of the most recently completed power plants a kilowatt-hour of power is being made at the astonishingly low consumption of only 1 lb. of coal.

This cheap provision of power for several years past has been and at the present time is to a rapidly growing degree displacing the individual power plant at which the use of coal was very much heavier. As a result of this change the increased use of coal at public-utility power plants throughout the United States for the five-year period from 1919 to 1923 has amounted to less than 3,000,000 tons, whereas the output of these plants has increased 50 per cent.

In addition to the foregoing also, we have at the present time to reckon with fuel oil, which is making itself felt in a competitive way at a great many points.

Odd also as it may seem to some, the great improvement in the transportation service of the country as a whole has greatly affected southern Illinois mines. With more cars and more engine power Eastern coal-carrying lines are in position to care regularly and fully for the growing markets of their coal-mine operators in this Western territory.

In times past a notable lack of equipment and other facilities to some extent isolated these Western markets from Eastern producing mines, especially during the late fall and winter months, and during that portion of the year southern Illinois mines have always enjoyed their best running time. Already a large part of this advantage has been swept away.

## Coal Company Raises Milk as a Sort Of Side Line to Mining Coal

**I**N THE group of pictures on the opposite page are illustrated a few steps of the United States Fuel Co.'s venture into dairying on a remodeled ranch near Hiawatha, Utah. The company originally bought a ranch of the varietal wild-west movie type, Fig. 1, with corral fences built of stakes and with sod-thatched log huts strung around the place. A dry arroyo ran along the back edge of the corral. The place was wont to raise a few cattle and some of the goats which range through the piñon of the foothills.

Now it is all changed. The dry arroyo still lies where water and the Almighty put it, but the rest of the ranch is different. A comfortable ranch house, Fig. 2, has been erected in the midst of a collection of good wooden sheds to house machinery and chickens, and a power and light line has been built to the ranch to supply illumination in houses and barns and to run the electrical machinery including milking devices. The ranch is irrigated with water brought down from the company's watershed back in the mountains.

A set of modern farm barns, Fig. 3, has been erected, a herd of milk cows has been purchased and the company has gone into the dairy business, distributing milk through its mining town of Hiawatha, Utah, and other communities within reach. One object of the enterprise was to guarantee the company's employees an adequate supply of milk hauled in so sanitary a way that the health of the communities would be safeguarded. The model dairy barn, Fig. 4, shown on the opposing page, is equipped with steel stanchions and feed carriers, and is otherwise built to house contented cows.

NOTE—From address delivered at meeting held by Lions Club at Herrin, Ill., Aug. 20, to ascertain causes and cure of present inactivity of southern Illinois mines.







# Bad Water Made Suitable for Domestic and Power Plant Use by Treatment and Purification

Water Usually Requires Less Treatment for Domestic Use Than for Steam Power-Plant Supply—Accumulation of Scale in Boilers Often the Greatest Operating Difficulty—Any Water Can Be Made Suitable

BY FRED L. SERVISS

Brookland, Washington, D. C.

**I**NJURIOUS substances occur in practically all water. However, when the water is to be used for domestic purposes the impurities generally are less objectionable than when it is to serve as boiler feed. The least desirable features in domestic water are turbidity, color, taste, odor, pathogenic bacteria and hardness. Though ordinary hardness is to be avoided in boiler-feed water, it is not hygienically objectionable. The impurities present in water usually are detrimental to boilers or interfere with their proper operation. The troubles from impure feed water are formation of scale, corrosion, foaming and priming.

Objectionable matter usually can be removed without difficulty from water for domestic use, but to render some waters suitable for boiler feed may require elaborate treatment. In the treatment of domestic water some of the color may be eliminated by filtration and all of it by chemical means. Water from swampy watersheds is characteristically colored, the colorization being produced by the growth of certain algæ on the water surface. Where water is drawn from lakes or reservoirs it may in the spring or autumn become obnoxious owing to its odor and turbidity, for at these seasons the water may be overturned either by being warmed by the sun's rays or by contact with the air. However, as water is a poor conductor of heat as well as a poor radiator, the changes in temperature will not be as great as those reached under similar conditions by solid rock masses.

## TEMPERATURE VARIATIONS IN RESERVOIRS

The temperature of lakes and reservoirs is of great importance where it is desirable to obtain water of good quality and uniform temperature. Seasonal changes of temperature, especially in deep ponds (50 ft. and deeper), may produce vertical currents and thus the water will vary in quality at different depths.

If a series of temperature observations are made throughout the year in any lake or reservoir, and at different depths, it will be noticed that the shallower depths show the greatest temperature ranges and the lower depths (usually below 50 ft.) show little or no variation in temperature. In summer the deeper layers of fresh-water lakes are quite cool because water is at its greatest density at 39.2 deg. F. and the water which becomes cooled to this temperature in the winter naturally sinks to the bottom and when there the low conductivity of water prevents the warmth of the sun being communicated to it.

In the cooler seasons of the year the bottom temperature is at 39 deg. F., and it may be even below that if during severe weather the water has been stirred by high winds. The several water layers will lie in the order of their density, the temperature increasing up-

ward to within a few feet of the surface, where it will approach the atmospheric temperature or freezing if the surface is covered with ice. The water will remain in this state until the weather warms the surface to the temperature of the bottom layer, causing a state of unequal equilibrium, and because of this unstable condition circulation will take place from the top to the bottom.

This phenomenon is known as the working or overturning of the water and takes place in early spring and autumn. During the quiescent period of summer stagnation may occur, and if much organic matter such as dead leaves and plants, is present, may continue until all the available oxygen of the water is consumed. The water then becomes darker, has a disagreeable odor and taste. With the overturning of the water, especially in the autumn, this decayed matter is stirred up and so brought to the surface.

If a pond or lake is less than 25 ft. deep the temperature variation is not great, for such relatively shallow ponds are easily stirred to their depths by the wind, thus keeping the temperature equalized. These shallow sources usually produce turbid water which needs filtering.

Tastes and odors although often harmless are nevertheless objectionable in a domestic-water supply; they usually are due to the same cause as color. They may be removed by aeration and filtration or by chemical means. By proper location of off-take pipes pure water may be obtained throughout the year. In deep artificial reservoirs an auxiliary low off-take pipe usually is provided for drawing off the impure and stagnant water in the autumn.

## HARDNESS EITHER "TEMPORARY" OR "PERMANENT"

Hardness may be defined as that quality the variation of which makes it more difficult to obtain a lather of suds from soap in one water than in another, and is direct evidence of the presence of scale-forming impurities in the water. It is objectionable in domestic water used for washing or the laundry because much soap is consumed in eliminating the impurities before a lather can be obtained.

Hardness is classed as "temporary" or "permanent," the distinction being that temporarily hard water may be softened by boiling, whereas permanently hard water must be treated chemically to render it soft. Temporarily hard waters are those containing bicarbonates of calcium, magnesium or iron, which are removed by boiling, the bicarbonates being reduced to normal carbonates which are practically insoluble and are precipitated from the water. The familiar "fur" in a tea kettle or the boiler crust in a boiler are the precipitated normal carbonates.



Water containing no other impurities than the carbonates or bicarbonates mentioned may be softened by boiling. Permanently hard waters are those containing the sulphates of calcium and magnesium, principally calcium sulphate, which can be precipitated only by heating to near 300 deg. F. or removed by chemical treatment. The total hardness of a water is the combined temporary and permanent hardness, which may be determined in many ways, the most accurate being to compute the total hardness from the chemical analysis of the water. The soap method may be used to obtain an approximate result, but it is not to be recommended.<sup>1</sup>

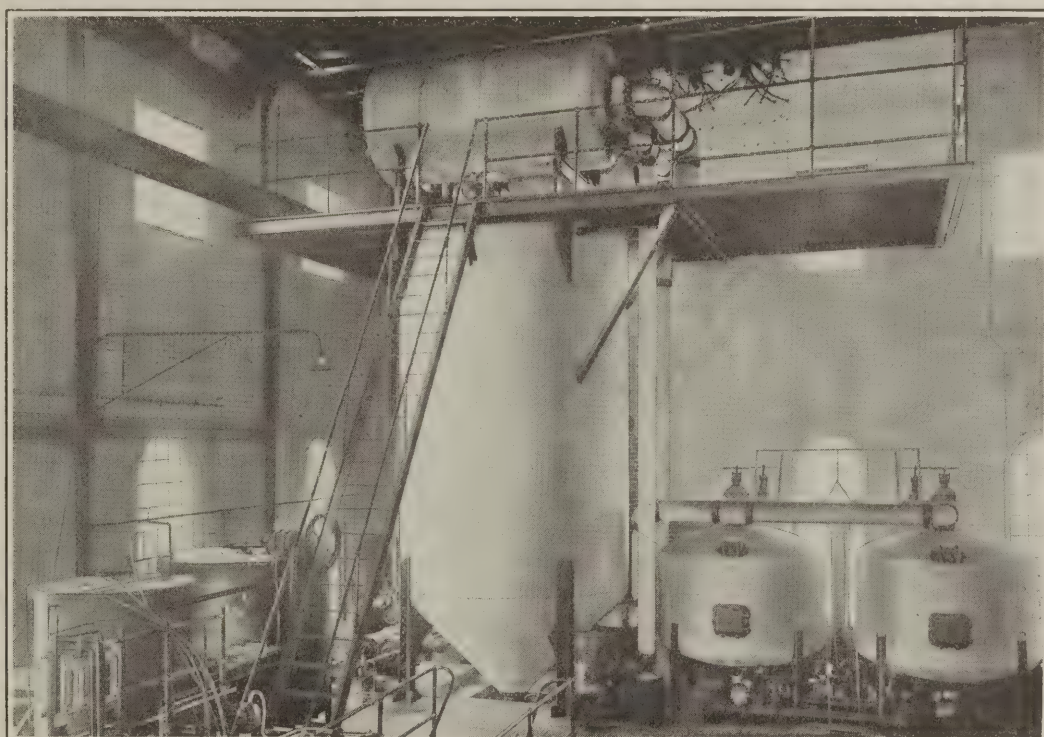
The hardness of water is estimated in "degrees." In France and in some chemical laboratories one part of calcium carbonate (or its equivalent of other impurities) per 100,000 parts constitutes one degree. In the United

accumulates to any extent, the life of the boiler may be shortened, and its condition eventually may cause an explosion. The removal of impurities which cause a water to be permanently hard requires an elaborate chemical process and will be discussed under the treatment of water for boiler use.

Contamination of domestic-water supply by sewage is not necessarily objectionable, but there always is the possibility that domestic sewage is contaminated with pathogenic bacteria, especially germs of cholera and typhoid fever. *Bacillus coli* (*B. coli*) are bacteria present in great quantity in the intestines of human beings and some animals, and are more tenacious of life than either the germs of cholera or typhoid, so that in the sanitary examination of a water the absence of the *B. coli* group is taken to be certain indication of the

### An Indianapolis Purifying Plant

Water system of water softening, a combination chemical and heat treatment, as installed at the Indianapolis plant of the Merchants Heat & Light Co. by the Power Plant Specialty Co. of Chicago. The large tank is the heater and precipitator, the smaller tanks are filters and containers for lime and soda ash. The plant has a rated capacity of 6,000 hp.



States one degree is one grain per U. S. standard gallon or one part in 58,333 parts. The English degree is one grain per gallon of 70,000 grains. In the United States waters containing up to 10 grains of hardening impurities per gallon are considered soft; 10 to 20 grains per gallon, moderately hard, and above 25 grains per gallon, very hard.

### SCALE HARMFUL IN SEVERAL WAYS

When hard water is fed continually into a boiler, naturally the precipitated matter accumulates and in time produces a heavy scale or crust which settles on the tubes. This scale, being a poor conductor of heat as compared with iron, will increase the consumption of fuel many times. In addition, the iron, not being in direct contact with the water, is heated to a higher temperature and may become red hot, thus oxidizing more quickly on the outside next to the fire than when properly cooled by the water within. It also will displace the hydrogen from the water or steam on the inside, in time changing the iron on both sides to the brittle magnetic iron oxide.

If care be not taken to remove this scale before it

absence of pathogenic germs. Presence of chlorine and certain compounds of nitrogen are evidence of pollution by sewage. Examinations for the above mentioned impurities should be made by a sanitary chemist.

In order to determine whether a certain water is fit for domestic or industrial use, a complete analysis should be made. From such analysis it can be determined what treatment, if any, should be employed before the water is used.

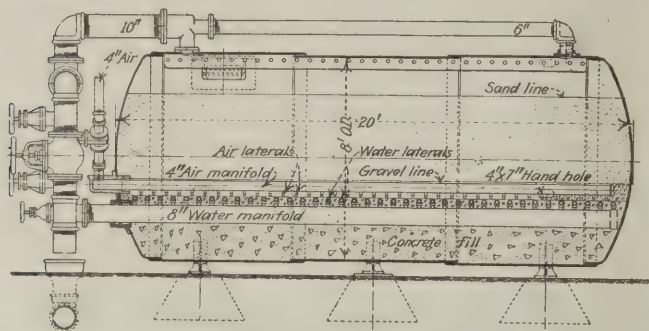
### TYPE OF ANALYSIS DEPENDS ON INTENDED USE

Water analyses may be divided into two parts: (1) Sanitary, physical and chemical, and (2) mineral. Under the head of sanitary analysis would come the physical examination of the sample to determine its turbidity, color, odor and taste; and under chemical analysis for the total residue, fixed solids, loss on ignition, free and albuminoid ammonia, certain nitrogen compounds, chlorine as chlorides, and oxygen consumed. When water is to be used for domestic purposes microscopical and bacteriological examinations also are made. The former consists of the enumeration of the kinds of microscopic organisms and an estimate of their quantity. It is used to indicate sewage contamination or pollution and often is helpful in explaining the chemical analysis and the

<sup>1</sup>"Standard Methods of Water Analysis," American Public Health Association, Boston, 1917.



presence of odors, color and taste. The bacteriological examination is made for the purpose of determining the presence or absence of certain harmful bacteria, more especially the B. coli group, to which reference already has been made. From these analyses the sanitary quality of the water is judged and its availability



Horizontal Pressure Filter

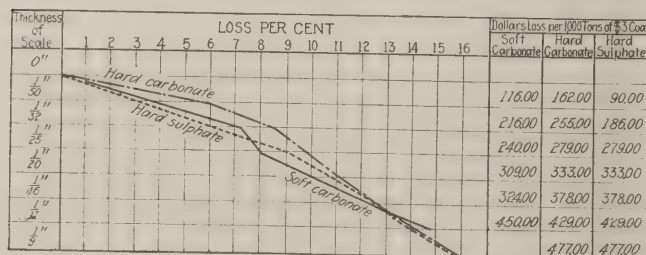
This air-agitation filter is constructed on the reverse-current-wash principle and is manufactured by the American Water Softener Co., of Philadelphia. The internal pressure in these filters may run up to 100 lb. or over.

for domestic consumption determined. The interpretation of a sanitary analysis is a matter of experience and as yet no hard and fast rules have been set down.<sup>2</sup>

It is not difficult to obtain a complete analysis which will show the incrusting and non-incrusting impurities. Before this analysis is attempted, however, the physical properties should be determined, and in the case of a turbid water it should be filtered and the analysis for mineral matter made on the filtered portion.

Domestic water may be purified in several ways: (a) By settlement (either naturally or by adding a coagulant such as alum); (b) by sunlight or by a chemical treatment with chlorine or ozone, all of which diminish bacterial life; or (c) by aeration, which expels objectionable odors, or again by sunlight, which decolorizes the water.

The water may be aerated by allowing it to fall over a cascade or dam. The water may then be filtered so as to decrease the turbidity. Coagulation is used to render a turbid water clear. It also effectively removes bacteria. Alum, in the proportion of one grain per gallon, is commonly used as a coagulant, being added before the water reaches the storage reservoir. When



Cost of Letting Scale Accumulate in Boilers

To obtain high boiler efficiency the flue-gas should leave the heating surface at as low a temperature as possible. Scale defeats this by preventing rapid conduction of heat from the flue-gas to the water. This curve, based on Prof. Schmidt's determinations at the University of Illinois, is published by courtesy of the Power Plant Specialty Co., of Chicago.

it is used relatively small ponds will serve for settlement. If the water is slightly hard crude alum alone is added, but if no lime salts (calcium salts) are present, lime is needed to assist in the coagulation.

<sup>2</sup>"Standard Methods of Water Analysis," American Public Health Association, loc. cit.

In many localities crude ferrous sulphate, a byproduct from cleaning iron, is used and is cheaper than alum. However lime also must be present in the water or be added to it. The lime precipitates ferrous hydroxide, which is easily and quickly oxidized to colloidal ferric hydroxide. This coagulates the suspended matter much the same as alum.

#### LIME TREATMENT FOR TEMPORARY HARDNESS

The temporary hardness of a water may be reduced by using slaked lime in the proper proportion, about 0.1 lb. per 1,000 gal. of water for each U. S. degree of hardness. This treatment may be applied to a water which is both turbid and temporarily hard. Filtering if properly conducted is efficient in removing turbidity and bacteria, and in many cases will decrease the discoloration. Filtration may be by either of two methods: (a) Slow sand filtration; (b) pressure or mechanical filtration. In using the slow sand method if the water is very turbid with an excess of algae it should be subjected to preliminary sedimentation or coagulation before it is admitted to the slow filter bed; this to prevent clogging and unnecessary cleaning and renewing of the sand bed. Mechanical filters are used after preliminary coagulation or coarse filtering. They are more rapid than slow filters, require less space, and are efficient when properly designed and controlled.

An added precaution often taken in treatment of water for domestic consumption as protection against bacteria is disinfection. Chlorine is used extensively for this purpose, the two most common forms being calcium hypochlorite  $\text{Ca}(\text{OCl})_2 \cdot \text{H}_2\text{O}$ , and liquid chlorine supplied in tanks under pressure. If the calcium salt is used it first must be emulsified with water and then continuously agitated while being fed to the water to be treated. Liquid chlorine necessitates special feeders which when once in operation require little attention.

In some instances water for drinking is boiled to insure its sterility, all pathogenic germs being killed by this method in less than five minutes. The taste of boiled water is not pleasant and may be improved by aeration, but this is likely to undo the effect of the boiling by recontaminating the water. Distilled water is perfectly safe, but from a physiological standpoint is not desirable for continued use.

The mine operator, from the standpoint of power development, is familiar with the great heat losses and the increased operating expense resulting from scale formation, corrosion and rusting. To these may be added other disadvantages less frequent but nevertheless troublesome and dangerous—namely, foaming and priming. When an untreated feed water is evaporated to steam in a boiler, all the impurities are left behind, and as the evaporation proceeds, the concentration of the scale-forming impurities increases until crystallization or precipitation takes place. The precipitated matter is the scale or sludge found in boilers. As has already been noted, the effects of scale are: (1) A reduced steaming capacity, and (2) overheating, with liability to explosion. The first effect results in fuel waste, the second is extremely dangerous.

#### MINERAL ANALYSIS FOR BOILER FEED WATER

The chemist bases his judgment of the value of a water for boiler use on the results of the mineral analysis, consideration being taken of the following points: Sulphates of calcium and magnesium are the



chief scale-forming impurities; the carbonates and bicarbonates of the same metals will be deposited as sludge and not as scale if the sulphates are low or absent, but if calcium sulphate be present even in small quantities it will tend to act as a cement and form a scale with the carbonates.

The treatment of boiler-feed water in general deals with the elimination of the scale- and sludge-forming impurities. Other materials usually found in water and considered harmless have been found by analysis in the boiler scale, proving that if sufficient cementing material be present they will add to the trouble. The chloride of magnesium, known to be an active corrosive agent, is a very soluble compound often found in natural waters. In dilute solution it has a very corrosive effect upon iron; the reaction appears to be catalytic, as the chloride of magnesium shows no diminution and no magnesium comes out of the solution.<sup>3</sup>

Large quantities of alkali carbonates as well as much organic matter may cause foaming and priming. Priming causes the steam to carry with it more or less water

methods: (1) The soda process, in which carbonate of soda or caustic soda is used to precipitate the sulphates of calcium and magnesium. Either the carbonate of soda or caustic soda may be used alone or in combination, depending upon the water. Caustic soda generally is used when the water contains much carbon dioxide. It is changed to carbonate of soda, which then reacts on the water to remove the remaining impurities. (2) The lime process, also known as Clarke's process—In this method, the necessary milk of lime or lime water is added to convert all the acid carbonates of lime (calcium) and magnesium into normal carbonates, in which form they are precipitated. In this treatment we have the curious paradox: "Add lime to remove lime." (3) The soda-lime process—This is a combination of the first two and the one most generally adopted. It is used on water that contains the sulphates of calcium and magnesium together with their bicarbonates or free carbonic acid, which combination will tend to render the soda process ineffective.

#### HEAT TREATMENT SATISFACTORY IN SOME CASES

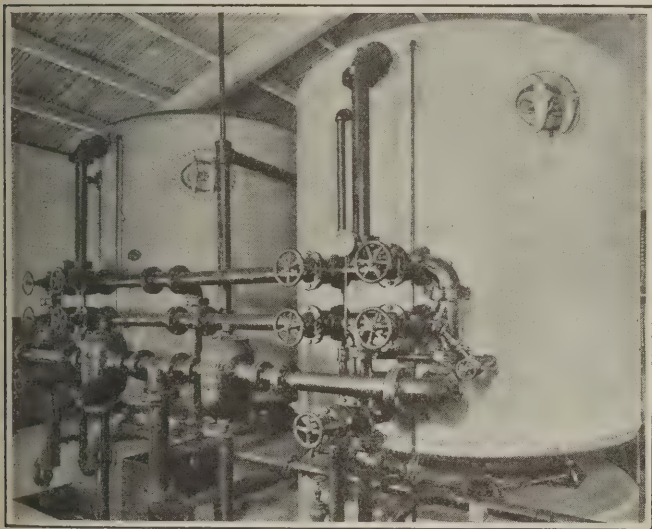
Preheating the feed water, often referred to as the "heat treatment," is employed where the water contains carbonates of calcium and magnesium with free carbonic acid and no sulphates. The temperature to which water must be heated before it enters the boiler depends entirely upon the quantity of dissolved salts. Open-type heaters are used where the dissolved salts will precipitate out below 200 deg. F., these being the carbonates previously mentioned. In certain instances the sulphates have been removed from feed waters by preheating to nearly 300 deg. F., using live-steam heaters or economizers in which this high temperature can be maintained.

Many plants require for economy a combined chemical and heat treatment, heat being used to remove the temporary and chemicals to remove the permanent hardness. Commercial chemicals are employed in the chemical treatment, the more common being lime (containing 90 per cent CaO) and soda (58 per cent Na<sub>2</sub>O). Barium hydroxide, a byproduct of cement manufacture, is efficient in removing permanent hardness, but is relatively expensive compared with lime. Other compounds often used are barium chloride, barium carbonate, sodium oxalate and alums, all of which are more or less costly and used only in rare cases. It is desirable that all treatment of water take place before the water is fed into the boilers. There are times, however, when internal treatment is permissible, but it should not be undertaken without the advice of an expert.

#### CAN READILY DETERMINE LIME AND SODA NEEDED

Many methods have been devised for the rapid estimation of the quantity of lime and soda necessary for softening water.<sup>4</sup> The accompanying table has been calculated to show the quantity of soda or lime to be used in treating 1,000 gallons of water, each gallon containing one grain of the impurity noted, from which it is possible to calculate the quantity of chemicals necessary to use when the impurities are shown from a mineral analysis.

What is known as the "Permutit process" often is used in water-purification systems. Permutit is an artificial sodium silico-aluminate (Na Perm) supplied for use in the form of coarse sand. The calcium, etc., in the



**Permutit Type of Zeolite Water Softener**

Zeolite in the form of coarse sand removes such impurities as calcium, magnesium and iron by a chemical exchange. A treatment with common salt restores the zeolite to its original activity. It is claimed that this zeolite can be used over and over again for a period of twenty years.

in suspension, which, if it enters the engine cylinder, may cause a cylinder head blow-out. Where surface condensers are used and the water fed again to the boilers some effective means of separating the oil from the water should be used. This precaution is not necessary with turbines where oil is used only on the bearings and not fed into the steam.

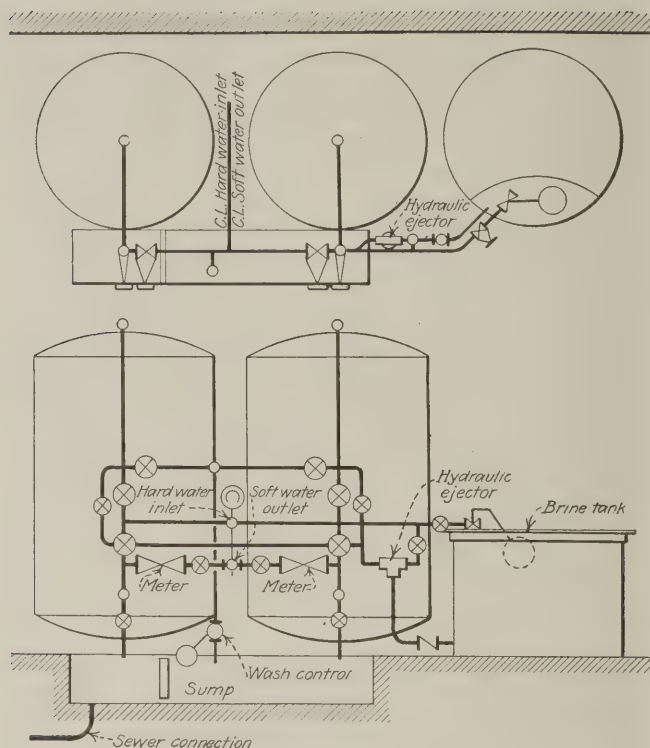
Waters containing undesirable impurities may by several methods of treatment be rendered suitable for boiler use. The water may be treated chemically, in which case the impurities are precipitated, or by preheating, which results in the elimination of carbon dioxide and in the consequent reduction of the power of the water to hold certain salts in solution, thus precipitating the undesirable compounds. The heat treatment is of value only in treating temporarily hard waters. Chemical treatment must be used on those that are permanently hard. Should the water be turbid, carrying much suspended matter, it must be coagulated or filtered.

Feed water may be treated chemically by one of three

<sup>3</sup>"Boiler Chemistry and Feed Water Supplies," J. H. Paul, Longmans, Green & Co., London, 1919.

<sup>4</sup>Water Supply Paper No. 274, U. S. Geological Survey, Washington, D. C.



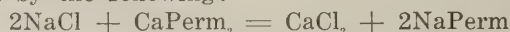


Plan and Elevation of Zeolite Plant.

This illustrates the double-vertical type installation of the Permutit Co., of New York. The units may also be placed horizontally.

water is exchanged for the sodium of the permutit which does not form scale:

$\text{Ca}(\text{HCO}_3)_2 + 2\text{NaPerm} = 2\text{NaHCO}_3 + \text{CaPerm}_2$ ,  
the calcium compound being insoluble. After twelve hours' use the permutit is covered with a dilute solution of salt and allowed to stand for twelve hours, after which time it is ready to be used again. The reaction is shown by the following:



Only common salt ( $\text{NaCl}$ ), which is inexpensive, is used, the calcium-chloride solution ( $\text{CaCl}_2$ ) being al-

Showing Impurity, Effect on Boiler, Remedy and Quantity of Soda and Lime in Pounds Required to Treat 1,000 Gal. of 1 deg. U. S. Hardness

Impurity	Effect	Remedy	Lime	Soda
Calcium Chloride.....	Corrosion.....	Soda.....	0.113	0.137
Magnesium chloride.....	Corrosion.....	Soda.....	0.113	0.161
Magnesium carbonate.....	Scaling.....	Lime.....	0.105	0.077
Ferrous carbonate.....	Crusting.....	Lime.....	0.077	0.202
Carbon acid gas.....	Crusting, priming	Lime.....	0.068	0.015
Magnesium bicarbonate.....	Crusting.....	Lime and boiling	0.015	0.111
Calcium bicarbonate.....	Crusting.....	Lime and boiling	0.105	0.126
Calcium sulphate.....	Scaling.....	Soda.....	0.101	0.100
Magnesium sulphate.....	Scaling.....	Soda and lime...	0.126	0.114
Ferrous sulphate.....	Scaling.....	Soda and lime...	0.091	0.155
Ferrous sulphate.....	Scaling.....	Soda and lime...	0.091	0.155
Free sulphuric acid.....	Corrosion.....	Soda and lime...	0.091	0.155

Table based on lime containing 90 per cent  $\text{CaO}$ , soda 58 per cent  $\text{Na}_2\text{O}$ . The results are theoretical, however, and to obtain the best results with the treatment suggested the weights of the chemicals should be increased by 10 per cent.

lowed to run to waste. Permutit is effective in removing iron, manganese, magnesium and other elements in the same way. The life of a charge is said to be over twenty years.

Simple tests may be made on a water to determine the presence or absence of injurious compounds by anyone with little or no knowledge of chemistry by following simple directions.<sup>5</sup>

Water treatment and purification, either for domestic or industrial use, should not be undertaken without

the advice of one familiar with such work. Avoid all secret preparations; they are either worthless or contain ordinary chemicals for which a higher price is charged under the name of a special preparation. In most cases it is a matter of chance that the compound is suited to the water.

Many large companies make a business of treating impure feed waters, and in the case of a bad water it is advisable to put the problem in the hands of these specialists. The importance of proper water treatment is shown by the extensive systems installed by many large industrial plants and municipalities and is one that deserves attention in isolated localities such as mining camps.

### Should Use Enough Coal on Washing Table for Perfect Stratification

**D**URING the past several months a study of the washability of fine sizes of coal on tables, with particular reference to Washington and Alaskan coals, has been conducted, in co-operation with the University of Washington, at the Seattle station of the Bureau of Mines. A coal from a Washington mine, presenting unusual washing difficulties, has been studied in considerable detail, using a particular commercial-size table. Float-and-sink tests of zonal products, supplemented by screen-sizing tests and chemical analyses, have given valuable information as to the workings of a coal table. This work is not yet completed but several conclusions of general application to any tabling operation may be drawn from the work to date.

There is a definite relationship between the tonnage of feed to a coal table and the maximum size of particles in the feed which will separate well on the table. The coarser the feed to the table, the greater must be the tonnage fed to obtain a good separation. A certain depth of material is required on the table to permit good stratification, this depth varying with the coarseness of the feed. On the other hand, there is an upper limit to the depth of material that can be separated on the table. These two factors will determine the maximum size that the table can handle.

The table used in the Bureau of Mines tests has a remarkable sizing action on all material that is properly stratified, that is, on all material that is not too coarse to stratify in the depth of coal on the table, and at the same time is not sufficiently fine to slime. The coarsest particles of any given specific gravity are discharged from the table first, and the finer the material the farther it will be carried out on the table before it is discharged. Materials of all specific gravities follow this same law. The result of this sizing action of the table is to make it impossible to obtain a clean separation between materials near in specific gravity when using an unsized feed. On the other hand, a separation using a classified feed will be favored by this action of the table.

The efficiency of the washing operation on tables is low when attempting to make a low-ash washed coal, and increases rapidly with higher allowable ash content in the washed coal. The explanation of this fact seems to lie in the fact that the largest proportion of the impurities is near in specific gravity to that of coal. The sizing action of the table previously mentioned causes an overlapping between material of different specific gravities, and the effect on the efficiency is more pronounced where the proportion is large.

<sup>5</sup>Coal Miners' Pocketbook, 1916, p. 428, McGraw-Hill Co., New York.



# Dividing the State of Pennsylvania Into Areas Having Coal of Equal Volatile Content

How These Areas Were Mapped—Their Form and the Reasons for It—Why Irregularities Exist and How Oil and Gas Are Found Only in Places Where Coal Contains Both

WITH A FEW exceptions the quantity of volatile matter in the coal of the Eastern half of the United States is determined by its geographical location. In consequence it is possible to draw lines that show where in the state the coal has a certain percentage of volatile matter. The lines so drawn are termed "isovols" from the Greek word *isos* and the English word volatile. These lines looking like contours separate areas of coal having a higher volatile content than those having a lower.

For several years the Pennsylvania Geological Survey has been co-operating with the U. S. Bureau of Mines in sampling and analyzing Pennsylvania coals. These analyses will be published later in bulletins of the Bureau of Mines. From the analyses thus collected it has been possible to construct a map showing the isovols of the State of Pennsylvania in greater detail than ever attained before.

It was originally intended to obtain and analyze samples of coal taken from every mine in the state, but inadequate appropriations seriously curtailed the work. For the most part, the samples taken were obtained by making a cut from roof to bottom, at a number of points in a coal seam, the impurities being rejected or included according to specifications furnished by the bureau. These samples, after being reduced by crushing and quartering in the customary manner, were packed in airtight cans for shipment to the laboratory where they were analyzed by the bureau engineers.

In addition to this, car samples were taken from coal shipped to Pittsburgh for testing purposes. Definite quantities of coal were taken from a car as it was being unloaded. The quantity taken was reduced to a convenient size, say about 50 lb., and this gross sample, being again reduced by crushing and quartering as before, the resulting sample was packed in airtight cans and sent to the laboratory for analysis.

## FOR SOME PARTS NEW ANALYSES NOT AVAILABLE

A third method employed was to analyze samples taken both at the mine and at points of delivery by persons not employees of the government. These, naturally, may vary in moisture and ash content, because of the drying out of the coal in transit or the inclusion of impurities loaded with the coal. For many outlying districts having no authoritative analyses, reports of the Second Pennsylvania Geological Survey and private companies were used. These analyses, of course, are less accurate than those made by the U. S. Bureau of Mines under ideal conditions.

In its routine of work, the Bureau of Mines had already analyzed a large number of commercial samples of coal taken for various departments of the government, particularly during war times. Many of these samples were shoveled from mine cars and the coal crushed and quartered before being shipped to the

laboratory in airtight cans. Other cars were sampled at their destination.

In compiling the isovol map shown in the accompanying figure approximately 1,500 analyses were made from samples of coal taken from 606 mines. These together with analyses of approximately 7,500 car samples, received from 75 mines throughout the state, were used as a basis, for determining the position of the isovol lines. Table I shows the number of mines sampled in each county:

Table I—Number of Samples Obtained for Drawing Map

Allegheny.....	20	Greene.....	21
Armstrong.....	40	Huntingdon.....	5
Beaver.....	6	Indiana.....	33
Bedford.....	5	Jefferson.....	26
Blair.....	2	Lawrence.....	3
Bradford.....	2	Luzerne.....	2
Butler.....	17	Lycoming.....	1
Cambria.....	92	McKean.....	2
Cameron.....	1	Mercer.....	5
Center.....	13	Somerset.....	77
Clarion.....	22	Sullivan.....	4
Clearfield.....	59	Tioga.....	9
Clinton.....	2	Washington.....	31
Elk.....	8	Westmoreland.....	44
Fayette.....	54		
			606

It should be explained here that, for the purpose of reducing the results of the analyses to a uniform basis, three forms were adopted: 1. Coal "as received" represents samples of coal received at the laboratory and assumed to represent the coal as it was cut in the mine, or taken out of the car as the case may be. 2. The "moisture-free" analysis represents the relative composition and heating value of dry coal and is used primarily for comparing similar coals of variable moisture content. 3. The "moisture-free and ash-free" analysis, known as the "pure-coal basis," represents approximately the relative composition and calorific value of the dry organic or combustible matter.

## MAP IS CONSTRUCTED "ON PURE COAL BASIS"

The percentage of volatile matter, on a "pure-coal basis," is obtained by the following formula:

$$\frac{\text{"As received" volatile matter}}{100 - (\text{ash} + \text{moisture})} = \frac{\text{Volatile matter in}}{\text{"pure coal"}}$$

In compiling the data for determining the position of the isovol lines on the map, the results of all the analyses were reduced to the pure-coal basis, although this is only an approximation; because ash does not have the same weight as the inorganic or incombustible matter in the coal. However, the maximum error is less than 1.5 per cent in comparing coals of about the same physical character and corresponding in ash-and-sulphur content. The greater the percentage of ash and sulphur, the greater the error in the pure-coal basis of rating.

Volatile matter on a "pure coal" basis is higher than on the "as received" basis which ordinarily is used in discussing the composition of coals. In coals having 20 per cent or less volatile matter on the "as received" basis, the volatile matter in the "pure coal" is approximately 1 per cent higher than in the coal on the former



basis and increases in direct ratio of 1 per cent to every 10 per cent of volatile matter on the "pure coal" basis.

Referring to the map, it will be readily recognized that the isovol lines there shown are necessarily generalized, although in the main they are accurate to a degree that is only limited by the lack of reliable samples in various localities. As would be expected, some analyses will appear anomalous, probably due to local variations of pressure in the folding of the strata. Naturally, such anomalies would have to be disregarded on a small-scale map.

The curtailment of the work for lack of adequate appropriations proved a serious handicap. In areas where the coal has been eroded, isovol lines are dotted and their position is more or less hypothetical, being based on the extent of folding and faulting in the district.

#### STATE HAS FEW COALS OF OVER 42.5 VOLATILE

Pennsylvania has few coals having in excess of 42.5 per cent of volatile matter. As indicated on the map, in small areas in the western part of Greene County and the southwestern corner of Washington County, together with a small area in the northwestern part of Washington, the southern part of Beaver County and the extreme western extremity of Allegheny County the volatile matter exceeds that percentage.

In general, however, the 42.5 isovol line marks the northwestern limits of the bituminous coal field in the state. Beyond this line to the northwest, only the lower beds of the Allegheny group and those of the Pottsville series are found, the overlying measures having been eroded. These lower beds cover but a small area, and their future value is negligible.

A careful study of the isovol map will show that Pennsylvania coals are generally and progressively less and less volatile from northwest to southeast. For example, the area containing coals ranging from 37.5 to 40 per cent of volatile matter, it will be observed, follow a general north-and-south direction along the valleys of the Monongahela and Allegheny Rivers to Redbank Creek, extending thence in a northeasterly direction in the vicinity of St. Marys and Coudersport. In the region of New Geneva and Lambertton, in Fayette County; Fredericktown and Millsboro, in Washington County; Herminie in Westmoreland County; Freeport, Johnetta, Manorville and Eddyville, in Armstrong County; and Summerville and Knoxdale in Jefferson County several small local areas have over 40 per cent of volatile matter.

In like manner, following the several isovol lines in regular order, the same gradual decrease in volatile matter continues in a southeasterly direction, till the Allegheny front is reached as indicated by the isovol showing 5 per cent of volatile matter, running through northern Schuylkill, southern Columbia, southern Luzerne and northern Carbon County is reached.

#### THEORIES OF ORIGIN AND FORMATION OF COAL

A brief reference to the origin and formation of coal will assist a clearer understanding of the isovol condition to which reference is here made. Recent work by Thiessen, Jeffrys, Turner and Randall on the microscopy of coals has proven conclusively their organic origin. Two general processes are responsible for the formation of coal. These are biochemical and the dynamo-chemical; the former referring to the

chemistry of organic life and the latter to the chemical agencies resulting from dynamic forces acting within the earth.

The former of these two processes does not carry the original organic matter farther than the formation of peat. On the other hand, the latter is the greatest factor in the alteration of the coal-forming material, involving changes both physical and chemical in their character. The action in the latter case is twofold, being the result of both heat and pressure incident to the movement of the strata in folding and faulting, causing gradual dehydration, whereby the volatile matter, including combined oxygen, hydrogen and nitrogen is progressively eliminated.

The origin of the dynamic forces that have resulted in mountain building and been accompanied with much folding and faulting of strata, in Pennsylvania, is generally attributed to an abnormal thrust that originated somewhere southeast of the state, its energy being dissipated in a generally fanshaped northwest direction. It is not commonly assumed that the action of this force was sudden, but rather that it extended over a long period of geologic time. However this may be the ultimate result was the upheaval of the Allegheny front, the effect extending northwesterly to the limits of severe folding in Fayette, Westmoreland, Indiana and Jefferson Counties.

The most anomalous variation in the gradual increase in volatile matter in the coal beds, from the Allegheny front northwesterly, occurs in the vicinity of Windber, in northern Somerset County, where the percentage of volatile matter is 15 per cent and less, though surrounded by areas ranging from 15 to 20 per cent. Though the cause of this local variation is unknown, it is Mr. Sisler's belief that beds of sandstone and limestone in the vicinity, by their greater resistance to the dynamic forces caused an undue devolatilization of the adjacent coal beds. David White believes that coal is more responsive to pressure than the enfolding strata, which would help to account for this local condition, which is found also at other local centers.

In southeastern Clearfield County, in the vicinity of Smoke Run and Osceola, the coals range from 20 to 22.5 per cent volatile matter, although surrounded by large areas of coal containing 22.5 to 25 per cent of the same. The rocks in eastern Clearfield County are much folded and faulted, though the faults are small, thrust faults predominating. The displacement here is generally less than 50 ft., vertically. Mr. Sisler's belief is that the areas low in volatile matter, in each of these cases, have been subjected to a greater pressure, because of the higher resistance of the adjacent rocks. In the latter case, however, the pressure has been somewhat relieved by numerous faults and the buckling of the beds.

#### RELATION OF OIL AND GAS TO COAL FORMATION

In a paper treating on the relations in origin between coal and petroleum, *Journal of the Washington Academy of Science*, Vol. 5, pp. 189-212, 1915, David White has advanced the theory that there is a direct relation between the rank of oils and the degree of alteration of carbonaceous deposits. He states that oils in regions and formations that have been altered but slightly by dynamic forces, are heavy and of low rank. On the other hand, regions that have been subjected to greater alteration, by dynamic influences, present oil of higher rank and lower specific gravity. Mr. White points out

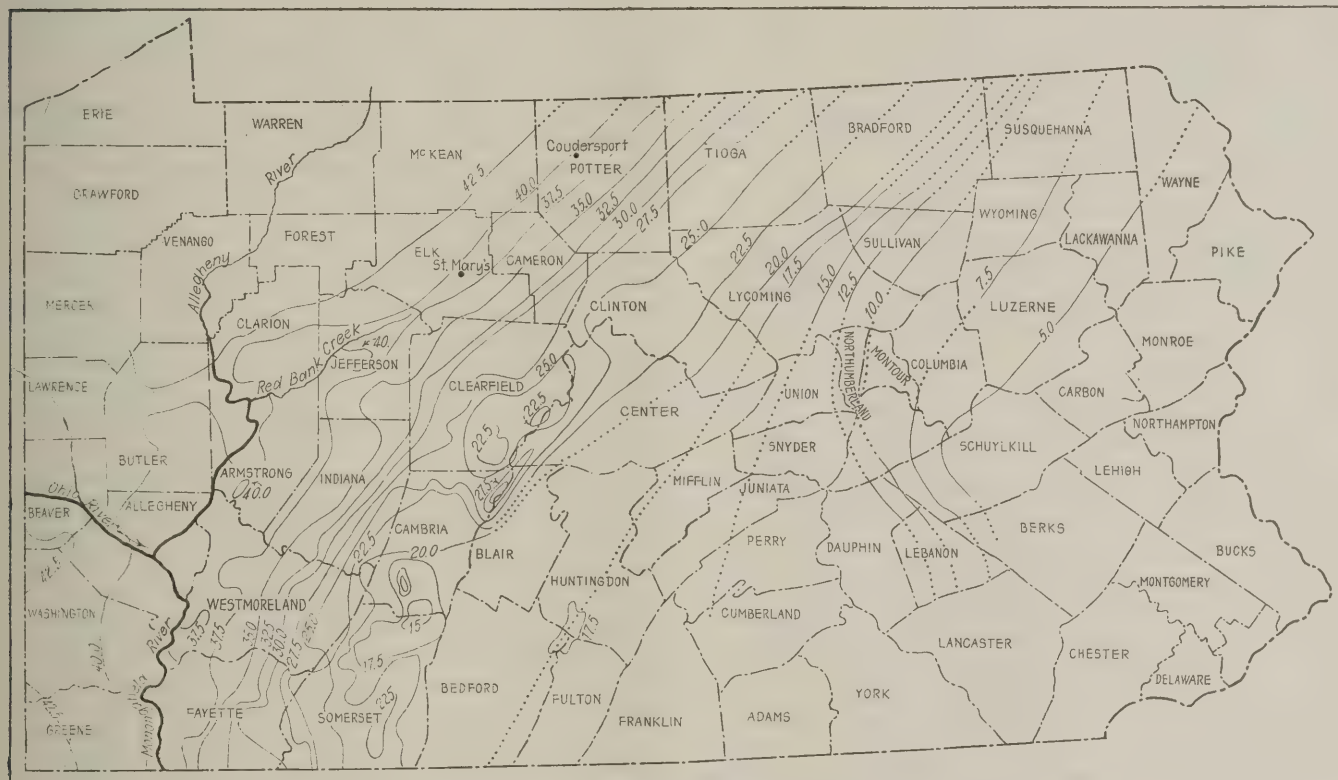


the fact that no pools of oil are present in rocks bearing coals having more than 65 per cent of fixed carbon, whereas in successive underlying formations, or in stratigraphically lower sands in the same formation, the oils are progressively higher in rank.

Applying these facts to the progressive devolatilization of the organic deposits in any formation, it is claimed that when the volatile matter has decreased to 30 or 35 per cent (pure-coal basis), in more provinces, commercial oil pools cannot be expected in that or any underlying formation, although commercial gas pools may occur in the border zone of higher carbonization.

In Greene, Washington and southern Allegheny Counties the oil pools lie on or west of the 40-isovol line, which cuts through the center of the gas fields in Greene, Washington and Allegheny Counties. In northern Allegheny, Butler and Armstrong Counties the oil pools lie on the 40-isovol line. In the northwest counties all of the oil pools lie west of the 42.5-isovol line. In Butler County, the gas fields are scattered, some of them being even west of the 42.5-isovol, whereas in Armstrong County the gas wells are east of that line.

The extensive gas pools of Greene and Jefferson Counties lie west of the 37.5-isovol, with the exception of



Map of Pennsylvania Showing Lines of Equal Devolatilization

In those sections where coal is absent, the direction of the lines is indicated by dots and has been roughly determined by a consideration of the probable stressing of the measures in the period of folding and from indications afforded by the nearest adjacent coal fields. The map was made

by using 1,500 analyses made of coal from 606 separate mines, spread somewhat evenly over the country. In some sections it was necessary, however, to take analyses made when the art was not standardized as at present and was not conducted as it is today. This introduces a slight inaccuracy which is unavoidable. The isovols, or lines of equal devolatilization, are in some places detached from the main lines and irregular. This is believed to be the result of unequal folding or of unequal resistance to rock pressures which caused a variation in the heat developed.

Table II, which is extracted from a paper by Myron L. Fuller, summarizes Mr. White's conclusions.

Table II—Relation of Volatile Matter (Pure-Coal Basis) to Oil and Gas Accumulation\*

Volatile Matter in Coal	Type of Oil Production
Under 30	Practically no oil and gas.
30 to 35	Small shows but no commercial production.
35 to 40	Isolated gas wells common, commercial oil pools rare, but of high rank.
40 to 45	Principal fields of light oil and gas of the world.
45 to 50	Principal fields of medium oil of Ohio, Indiana, and mid-continent.
Over 50	Fields of heavy Coastal Plain oils and of unconsolidated Tertiary or other formations.

\* Fuller, Myron L., Relation of Oil to Carbon Ratios of Pennsylvania Coals in North Texas; Economic Geology, Vol. XIV, pp. 536-42, November 1919.

#### OIL AND GAS POOLS IN PENNSYLVANIA

The hypotheses advanced by Mr. White hold true in the coal fields of Pennsylvania. The principal oil and gas pools lie west of the 35-isovol line. The principal oil pools lie west of or in the area containing coals having 40 per cent volatile matter. The 25-isovol line appears to be the eastern limit of the small commercial oil and gas pools.

a few near Punxsutawney, which lie between the 35- and 37.5-isovols. The gas fields of Forest, Elk, McKean and Potter Counties lie on or west of the 40-isovol. The Cameron gas field, which has not been extensively developed, lies on the 35-isovol, which appears to be the eastern limit of large commercial oil and gas pools. It may happen, however, that in areas east of this line where the alteration of organic material is great, some small wells may be found, but the oils will be light and of sporadic occurrence. Mr. Sisler suggests that wildcatting in eastern Pennsylvania should cease unless competent geologists or petroleum engineers consider the location favorable.

The percentage of volatile matter in coal affects its burning and so determines its suitability for various uses. The bituminous coals of Pennsylvania vary considerably in their composition and their adaptation to different uses. On this account, a coal must be chosen according to its type, if its use is to prove efficient.

The coals in northern Somerset County, particularly in the vicinity of Windber, and in Cambria Counties



are low-volatile, smokeless, steam coals. They are particularly valuable for railroad use and bunker fuel, besides being in great demand for domestic use. An excellent smithing coal occurs in the vicinity of Friedens, Somerset County, and in the vicinity of Lilly, Cambria County, these coals forming the upper Freeport seam. Lying to the east, the coals in the Broad-top field, in Bedford and Huntington Counties, average about 17½ per cent volatile matter and are highly prized for domestic fuel. Much of this coal is also used by the railroad and it has been coked with varying success, for many years.

#### COKING COALS VARY IN STRUCTURAL STRENGTH

Turning again to the west, the coals in the Johnstown region are mixed with other coals for coking. The coals on Black Lick Creek further west, in Indiana County, have been coked with much success as well as those in the vicinity of Bennington. The coals of eastern Westmoreland and Fayette Counties are used entirely for steam and domestic purposes, and those of the Connellsville basin, occupying the center of these two counties, have long been known as the Pittsburgh coking coal, from which high-grade coke has been produced for many years.

The coke from this district is unexcelled and has been used in blast furnaces since 1841. It is probable that this area of coking coal extends southwestward into Greene County, where the Pittsburgh bed lies under deep cover and has yet to be tested. The western portion of these two counties, together with northern Greene and southeastern Washington counties, form a typical gas-coal district. The coal in this area is particularly suited for making illuminating gas and is used extensively in the manufacture of byproduct coke.

Passing now to the north, the coals of northern Cambria County, Clearfield, Jefferson, Cameron, Elk and Clinton counties, are typical steam coals. They have been coked locally for use in blast furnaces. Clearfield County includes the area underlaid by the long-famous Moshannon coal, which has been highly valued for steam and domestic purposes, the coal being of the so-called smokeless type. The coals of Indiana County, on the west, are now almost entirely used for steam purposes. Some plants are coking this coal, which will probably be more extensively coked when the typical coking coals of southwestern Pennsylvania have been exhausted. They will at least be valuable in the near future for mixing with other coals for coking.

#### ARMSTRONG'S AND CLARION'S COMING GAS COALS

On the south and west, the coals of Washington, Allegheny, Beaver, Mercer and Butler counties are almost entirely used for steam and domestic purposes. Though containing a large percentage of volatile matter, these coals are much in demand as railroad fuel and much of it is also shipped to the Lakes. The coals in Armstrong and Clarion counties are high-volatile gas coals. Though now being used chiefly for steam and domestic purposes, these coals will undoubtedly gain an unexcelled reputation as unusually high-grade gas coals within a few years when the Pittsburgh bed, in the Irwin basin, becomes exhausted. In areas where the coal is high in ash and sulphur, however, it will be necessary to install picking and washing machinery to eliminate these factors.

The great variety of Pennsylvania coals offers the purchaser a wide field of choice.

## The Miner's Torch

### A Case of Conscience

MANUFACTURERS of equipment always feel beholden to employees of mining companies who help them make a success of experimental installations and occasionally such gratitude finds expression in terms of rather substantial presents. Without question such gifts are proffered with the best of intention on the part of the manufacturer, but—

While I was still young in the mining game I once recommended the purchase of equipment to my superiors and finally almost against their better judgment they followed my advice. Although there had been little precedent available to back up my judgment I made definite promises about the results that could be expected from the equipment and pinned my faith to them. The results obtained in the beginning were far from satisfactory and it is possible they never would have been satisfactory but for my efforts. (This may sound like self applause but it is not so intended.) I had more at stake than anyone else and I conducted myself accordingly.

After all of the "kinks" had been straightened out the general manager of the company that had furnished the equipment sent me a check for \$100 just to show that the company appreciated the interest I had taken in its problem. I kept the check two days trying to convince myself that I had a perfect right to it and then decided that I had no right to accept it, and returned it. "No man can serve two masters" was the argument that I could not get around.


I often recall that little adventure and sometimes it seems to me that in returning the check I was too jealous of my honor, but more often I feel just the other way about it. Just now it has been brought back to mind by a bit of gossip that I picked up concerning a man who was associated with me at that time. He was much disgusted with my decision and derived no small amount of pleasure from telling my friends about the incident; he generally wound up by quoting Shakespeare to this effect: "Conscience does make cowards of us all."

We drifted apart and I had lost track of him. Today a salesman mentioned his name and when I told him that I had not been in touch with him for a number of years he talked to me for more than an hour about my friend's "rise and fall," as he expressed it.

I learned that he rose rapidly and for a time seemed destined to reach a high place; then faltered in his climb and shortly began to drop back down the ladder. For the last few years he has never remained in one position long and each time the change has meant a smaller salary. "And how do folks account for this change in his fortune," I asked. "They say," said the salesman, "he has always had his hands out behind, if you know what that means, and in spite of his recent experiences he has not yet learned his lesson."

Well it hasn't helped him to know that "Conscience does make cowards of us all." Wonder if he ever heard this one: "If the camel once gets his nose in the tent his body will soon follow."





# News Of the Industry



## Competition from Ruhr May Force British To Prepare Coal Less Carefully

Loading by "Dustpan" to Keep Down Dirt and Breakage Restricts Quantity—Varieties From Same Bed Parted and Analyzed Separately—Americans Favor Practice Here

BY PAUL WOOTON  
Washington Correspondent of *Coal Age*

Americans who made the tour of British coal mines in connection with their attendance at the World Power Conference, at London, were impressed particularly in all the British fields with the care exercised to prevent breaking the coal. A degree of care is exercised that is entirely precluded in this country by high labor cost. Similar care is exercised to keep coal clean. In South Wales, for instance, there is universal use of a sort of exaggerated dustpan for loading coal in mine cars. The mine owners admit that the use of this "box," as it is called, restricts the amount of coal the men can load, but they explain that the use of regular shovels would result in dirt being dug up from the bottom.

South Wales continues to pay by the ton of "large" coal. At the tipple the coal passes over 1½-in. bars and is screened, weighed and recorded. One of the reasons why they use so little powder is the fact that they do not wish to break up the coal. Fortunately most British coal comes down easily. The desire to prevent breakage has become inborn. The British regard our mechanical trimmer as all but a criminal device. They are in no way interested in installing this "Yankee notion." They are convinced that their reputation in international trade is built largely on size. With the release of the Ruhr many Americans will not be surprised to see the competitive situation become such as to force the abandonment by the British of some of these practices which add to the cost of their coal.

### Separate Coal from Same Seam

Another practice which astounds visitors from the United States is the separation of coal coming from the same seam when there is a difference in its physical character. In Great Britain there frequently is a stratification within the seam such as is rarely encountered in the United States. The famous Barnsley bed, in Yorkshire and the Midlands, for instance, carries an extremely hard steam coal in one part of the seam and a much favored house coal in another. As this coal is loaded the steam coal is put in one car and the house coal in

another. The steam coal is dumped on one set of screens and the house coal on another. Pickers re-sort any lumps that may have been classified wrongly by the loaders underground. It is contended that the sorting adds very little to the cost of the coal, but does add very materially to the sales realization.

This rather common sharp difference of qualities in the seams has led to an interesting practice in sampling. We think of a coal seam as a homogeneous thing. Our approved method of sampling is to cut a channel through the seam from top to bottom and quarter the coal until the sample has reached a size that can be handled conveniently. In England, however, separate analysis are made for each layer composing the bed. They frequently reveal marked variations in the value of the coal. In one bed, for instance, this practice revealed that a coal which formerly was penalized because of its sulphur content was getting all of its sulphur from a narrow band in one part of the seam, which could be picked out easily. With that band removed the coal was marketable for metallurgical coke.

### Americans Favor Scheme

Some of the returning Americans think there might be some application of this practice to some of our coal seams. The suggestion will be made to the Bureau of Mines that some investigation be made.

The Americans found the British immensely interested in low-temperature carbonization. They are striving to attain a smokeless fireplace fuel which can be burned readily in the type of grate found in practically every room of a British residence. Byproduct coke and gas coke usually are not suitable. The best fuel to furnish the Britisher with his much-prized "cheery fire" is a coal only partly coked so that enough of the volatile content is left to produce the flame. This accounts for the intensive research in connection with low-temperature carbonization, where coking is not carried as far as in the byproduct oven.

This work also is being encouraged by the demand for motor spirit. The British are anxious to render them-

## Northwest Rate Changes Save from South Illinois Suspended Till Jan. 8

Investigation was ordered by the Interstate Commerce Commission Sept. 9 into new rates proposing to increase and reduce rates on coal from points in northern and central Illinois to points in Michigan, Minnesota, North and South Dakota and Wisconsin. The changes were to have become effective Sept. 10, but were suspended until Jan. 8, 1925, pending the result of the investigation.

The rates from southern Illinois, however, went into effect Sept. 10, as per schedule, incidentally causing much confusion. This leaves the other fields with a distinct advantage over the southern Illinois district. From the Linton field of southern Indiana, for instance, to the Twin Cities, the rate on lump coal is \$3.22 and on screenings \$3.05, while southern Illinois rates are \$3.75 and \$3.56.

selves less dependent on the outside world for motor fuel. Some of the low-temperature processes claim a larger yield of motor spirit than is obtainable as a result of byproduct methods. No less than six large semi-commercial plants are being operated on low-temperature processes. Another half dozen methods are in various stages of promotion, but have not reached the point of erecting an experimental plant.

In the opinion of the Americans who looked over the low-temperature situation a commercial success has been attained for no one of the processes. They do produce a fine coke which burns freely without smoke. Considerable amounts of tar and oils are recovered, but the recoveries are not sufficient to meet the capital charges.

The London Coke Committee, a co-operative body on which all the gas companies are represented, has succeeded in meeting the situation by designing an open grate which will burn gas coke. By introducing fluted channels in the grate and at the back of the fire box just enough draft is provided to burn this coke at the proper rate. As a result of this device, supplemented by attractive advertising, the London coke companies practically have solved the problem of finding a market for their coke and breeze. A portion of it, however, is being used successfully under boilers.



## Lewis Lambasts Stone For Not Paying Scale In Union-Owned Mines

The Coal River Collieries Co., which operates coal mines in West Virginia and Kentucky and is owned by members of the Brotherhood of Locomotive Engineers, is condemned by President Lewis, of the United Mine Workers, because it still refuses to sign a union scale agreement. The mines are shut down because they cannot break even by operating under union demands, according to Warren S. Stone, head of the locomotive engineers and chairman of the board of the coal company. Mr. Stone's statement was contained in correspondence over the situation, with Mr. Lewis, made public by the miners' head in Indianapolis Sept. 9. Since last April the mines have been closed.

In a letter to Mr. Stone, dated Aug. 23, Mr. Lewis states that the employees of the Coal River company have been engaged in a strike since April 1, and declares that the company has assumed the same attitude as other operators in the field attempting to force the union men to take a wage reduction. "The Coal River Collieries Co., while not a member of the Kanawha Coal Operators' Association and while not utilizing the eviction instrument, is in all other respects apparently co-operating with the coal operators. This is an intolerable position for a coal company whose stock is largely owned and whose affairs are directed by union men to occupy."

In reply, Mr. Stone said that the miners' union failed to carry out its agreement with his company while it was operated on a union basis and that his company desired to continue operations last April, offering to continue existing wages until an agreement was worked out and to pay the increase if one was decided on. His company, he said, suffered loss of large contracts by being forced to close when the men refused an offer. He declared the mines had been closed rather than operate non-union. Mr. Stone denied that the miners of his company are on strike, declaring that they are ready to return to work now.

Calling attention to aid given by his brotherhood to the miners' union in cases of need, Mr. Stone's letter continued: "The members of the Brotherhood of Locomotive Engineers, who have invested over \$3,000,000 in these properties, are entitled to some return on their investment. I think you will concede this, and yet at the present price at which coal is selling, and the cost of mining under the Jacksonville agreement, it is impossible for the union mines to break even." Under the Jacksonville agreement, he said, labor costs for loading a ton of coal were \$1.63 and the ton sells for only \$1.50.

In reply, Mr. Lewis denied that his union had broken any of its agreements with the collieries company. "Your company occupies no different position in this matter than any other of the thousands of coal companies which have agreements with our organization. The United Mine Workers cannot be responsible for problems of

## Utah Gives Brotherhood Mine a Black Eye

The State of Utah does not think any too well of the Coal River Collieries of Kentucky and West Virginia, owned largely by the Brotherhood of Locomotive Engineers, and operated by a company headed by the head of the engineers' union, Warren S. Stone. Utah's Public Utilities Commission has denied the application of the company for the right to sell \$100,000 worth of its securities in Utah. Secretary Hicks, of the commission, said the company is operating at a loss. The commission refused to have the property of the company examined or appraised.

management in which they have no voice. The question of efficient management and low-cost production to enable you to remain in the market with competing companies is one that must be dealt with by your corporation. It is a problem that forever confronts one who elects to become a coal operator."

Mr. Lewis ended his letter by demanding that the collieries company negotiate an agreement with the union on the basis of the Jacksonville agreement. To this letter Mr. Stone did not reply and the correspondence is ended with a telegram from Mr. Lewis to Mr. Stone on Sept. 3 again asking Mr. Stone to reply to the letter asking that his company make an agreement with the miners' union.

## Huff Quits Presidency of Victor-American Fuel Co. In Shake-Up of Officials

The Victor-American Fuel Co., in Colorado, has changed officers. On Sept. 9 it was announced in Denver that W. H. Huff, president; G. F. Bartlett, vice-president, and S. I. Heyn, secretary, had resigned. The affairs of the company are in the hands of J. C. Osgood, of New York, principal stockholder and chairman of the board. He becomes the new president. Ben W. Snodgrass, former general superintendent, is made vice-president and general manager, and C. C. Deiter, treasurer, also takes the secretaryship.

No reasons for the resignations were assigned in the announcement but Mr. Huff has been in bad health for a long time. Mr. Osgood, who went to Denver about a month ago, was quoted in the Denver papers as saying: "I will take over a large part of the work of the three men and the remainder will be divided up among the other officers of the company. There will be no change in the company's policy. I have been the real manager of the company all along and I am now merely taking over the active management."

The Victor-American Fuel Co. is one of the largest operating coal companies in Colorado, having mines in Las Animas, Huerfano, Fremont and Routt counties. No important property changes are contemplated.

## Pennsylvania to Buy Control Of Norfolk & Western

A move by the Pennsylvania R.R. to acquire control of the Norfolk & Western Ry. by the purchase of common stock instead of by lease, as indicated some months ago, is reported to be definitely under way. This is the first definite information concerning the plans of the Pennsylvania since the announcement during the summer that the two committees of the roads, formed to consider possible merger terms, had abandoned further meetings for two or three months.

Two propositions, both involving the purchase of the Norfolk & Western stock and the formation of a new coal company, were outlined. The first plan provides that payment for the stock be made in 6 per cent bonds, together with one-fifth of a share in the new coal company for every share of Norfolk & Western. The price of the Norfolk & Western shares would be \$150 each.

### May Accept Counter Proposition

The counter proposition included the payment of a 20 per cent dividend and a guarantee of 8 per cent of Norfolk & Western stock and one share in the new coal company for each share of Norfolk & Western now held.

Of the two propositions the latter was generally considered to be the one that would prove more acceptable to the Norfolk & Western stockholders. In either case the announcement is considered as putting an end to the vague rumors of a possible lease to be obtained by the Pennsylvania.

The new coal company, according to the announcement, would be formed to take care of large holdings of the Norfolk & Western in the Pocahontas coal region of Virginia and West Virginia and would probably also include some holdings of the Pennsylvania. At present the Norfolk & Western owns all the capital stock, except directors' qualifying shares, of the Pocahontas Coal & Coke Co. This company does not mine or sell coal, but makes leases on royalties to operating companies. About 178,000 acres of its lands and rights were being so leased on Dec. 31, 1922, the last figures available.

### Has Coal Holdings in Kentucky

Under agreement with various coal companies, the road operates lines into other coal sections of West Virginia, including Mingo County. Eleven hundred acres of coal land in Pike County, Kentucky, formerly leased by the Pond Creek By-Products colliery became the property of the Norfolk & Western in 1921, representing an investment of approximately \$370,562.

One reason believed likely to influence the purchase of the stock instead of the lease of the line by the Pennsylvania is seen in the fact that the Pennsylvania already owns a large block of the Norfolk & Western common. On Dec. 31, 1923, the par value of the stock amounted to \$38,757,700, and at the present selling price would represent an investment of nearly \$50,000,000.



## Strikers Suffering Some In Western Kentucky

With cold weather close at hand it is believed that there may be some breaks in the ranks of the union miners in sections of the western Kentucky field around Central City, where the strike has now been absolute over an area of about 20 square miles for nearly five months. So far there have been no breaks in the Central City territory, and miners took it as a joke when the companies tried to resume at reduced wages Aug. 25.

The Central City field has been organized for more than 25 years, and is firm in its belief in the union. Union benefits have been small, however, and unless increased, the workers won't be able to go very far into the winter. Eviction suits may be started in that section before long, as has been the case in the lower fields. Over the summer the miner can get along with his garden and small benefits, but the pinch of winter is different.

Already there has been some breaking into stores and stealing of food-stuffs. One operator recently had some of his own workers arrested, charged with storehouse robbing, which indicates that workers are getting more desperate.

The Norton Coal Mining Co., at Nortonville, recently reached an independent non-union agreement with workers and resumed operations. During the night of Sept. 4, four notices were posted about the camp, signed "Herrin," West Frankfort, Ill., "Muhlenburg," and "Indiana," these notices bearing "Quit Scabbing" in crude lettering, and amateurish drawings of coffins.

## July U. S. Soft-Coal Exports Largest of Year

Exports of bituminous coal from the United States during July, 1924, amounted to 1,630,849 gross tons, a notable increase over the 1,424,194 tons shipped during June, which had been the largest monthly shipment during the current year, according to the Coal Division of the Department of Commerce. Overseas exports amounting to 418,500 tons, against 317,325 tons in June, likewise were the largest of the year. Exports to Canada during July amounted to 1,202,400 tons, as compared with 1,096,467 tons in June, topping all other monthly shipments during 1924.

One of the reasons for increased overseas shipments in July was the heavier movement to Italy, totaling 115,055 tons, against 71,848 tons in June. Only during the past two months has any coal been exported to Germany during the present year, 3,743 tons being shipped in June and 8,227 tons in July. Of particular interest is the 5,542 tons of bituminous coal destined for Austria during July.

Exports to all countries of South America were the second largest monthly shipments during 1924, amounting to 39,098 tons, as compared with 84,302 tons during June. The 104,959 tons of coal shipped to Brazil



C. E. Lawall

Assistant professor of mining engineering in the University of West Virginia, who has been designated acting head of the department with the rank of associate professor. He succeeds A. C. Callen, now dean of mining at the University of Illinois.

during July represent a large increase over the 66,078 tons exported in June and take second place in monthly shipments to that country during the current year. To Argentina exports totaled 19,104 tons, also an increase over the June shipments, and while there were no exports to Uruguay during June, 5,014 tons were shipped during July.

Two unusual features of the exports during July were shipments of 5,745 tons to the Philippine Islands and 6,590 tons to British Oceania.

Exports of anthracite during July totaled 290,097 tons, against 349,134 tons in June, Canada receiving 279,088 and 335,154 tons respectively in the two months. Coke exports amounting to 48,983 tons, against 48,238 in June, are the highest since March. Of the total coke exports, Canada received 40,438 tons in July compared with 39,691 tons in June.

## Lackawanna Not to Merge, Says Truesdale

William H. Truesdale, president of the Delaware, Lackawanna & Western R.R., denies that his road is involved in the merger plans of the Van Sweringen or will be part of any other system. "The Lackawanna is going into no system," he declared, when attention was drawn to the report that the continued strength of the stock reflected buying by Van Sweringen interests.

Mr. Truesdale was unwilling to make any statement in reference to the \$60,000,000 of Glen Alden Coal Co. bonds now held in the treasury of the Delaware, Lackawanna & Western. Recent rumor has it that these bonds were slated for distribution among stockholders of the road.

## Railroads Make New Record In Efficient Use of Coal

Railroads of the United States made a new record in the economical use of coal during June of this year, according to records of the Interstate Commerce Commission, following urging by the American Railway Association and the International Railway Fuel Association that greater care be exercised in the use of fuel.

Freight locomotives in road service consumed 135 lb. of coal per 1,000 gross ton-miles in June, 1924. The nearest approach to this record since statistics have been kept was 141 lb. in June, 1922. The fuel consumed per passenger car mile in June was 15.6 lb., as compared with the previous record of 15.8 lb., made in June, 1922.

The fuel consumption in June of this year was 11 lb. less per 1,000 gross ton-miles than in June, 1923. In the first six months of this year there was a reduction of 13 lb. of coal used per 1,000 gross ton-miles, making a total saving of approximately 3,371,500 tons of coal at an average price of \$3.17 per ton, meaning a saving of about \$10,688,000 for the six months' period.

In passenger service the first six months of the year showed a reduction from 19.2 to 17.7 lb. per train car-mile, resulting in a saving of about \$4,235,000 in cost of fuel. In the first six months of the year, therefore, the total saving resulting directly from fuel economy in both the freight and passenger services amounted to almost \$15,000,000.

This economy has been brought about largely through the concerted and persistent efforts of the railroads to impress upon their employees the importance of fuel economy. Men concerned with the handling and use of fuel have been educated through the medium of meetings, posters and the moving picture. Some roads have set up "bogies" and have checked performances against these standards set.

A number of other reasons have contributed to this increased fuel economy. The railroads have been gradually retiring from service the older locomotives and substituting for them improved and more efficient types. Also during the recent comparatively slack period, the roads naturally stored their older locomotives and kept in service their more efficient ones.

## Cash Balance in Coffers of Miners' Union Gains

The auditor's report of the International union, United Mine Workers, for the six months ending May 31 last shows that the income for this period was \$1,320,861; expenditures, \$867,325, leaving a balance on hand of \$1,630,557, which includes \$961,900 of Liberty bonds.

Dues and assessment yielded \$1,257,051 among the income items. Salaries and expenses consumed \$369,332, publication of the *Miners' Journal* cost \$79,565, attorney fees amounted to \$65,560 and Ellis Searles was paid \$10,897 for "publicity." The balance on hand exceeded the balance of Dec. 1, 1923, by \$443,536.



## Alberta Miners Again Refuse 12½ Per Cent Cut

Overtures for the settlement of the coal miners' strike which has been in effect now for four months in eastern British Columbia and the Province of Alberta were made recently by James Murdock, federal Minister of Labor, but were rejected. He proposed a 12½ per cent reduction. W. A. Sherman, president of District 18, United Mine Workers, speaking for the miners' conference committee, said that it had been concluded, after careful deliberation and consideration, that the basis for settlement proposed was unjust and "cannot be conceded by our organization, and such is our decision." Mr. Murdock's suggestion was that the strike be settled on the basis of one-eighth reduction of wages existing as at March 31 last.

Commenting on the attitude of the miners' officials the minister said: "I think they have not a proper regard for the rights and interests of the public in the matter. I asked them to submit a referendum vote to the striking miners, but they declined to do so and I think they should have done that."

Mr. Murdock observed that common above-ground labor at the mines was striking for 82c. an hour while the current or fair wage for such labor was established in the government's fair wage policy as 45c. an hour. Mining carpenters were asking for better than \$1 an hour while the current and fair wage for carpenters in various parts of Canada was 80c. an hour, running, of course, somewhat lower and in some cases a little higher. A similar comparison, he said, might be made with other classes of labor.

"One reason for my suggestion," said Mr. Murdock, "was that in the Central Competitive region, upon which the miners in this territory base their claim, the miners' day is eight hours from face to face while the day in District 18 is eight hours from bank to bank. That means that the total elapsed period in

## Illinois Central Places Big Coal-Car Order

An order for new equipment, which railroad circles estimate exceeded \$16,000,000 in value, has been placed by the Illinois Central R.R. This order was for 6,200 new freight cars, of which 4,000 are to be gondolas, and follows closely upon an order of the same railroad for twenty-five mountain-type locomotives.

The order for 6,200 freight cars was distributed as follows: 1,000 gondolas each with the General American Tank Car, the Pullman Car & Manufacturing and the Western Steel Car & Foundry companies; 500 gondolas each with the Mount Vernon Car & Manufacturing and the Ryan Car companies; 1,000 box cars with the Standard Steel Car Co. and 1,000 box and 200 stock cars with the American Car & Foundry Co.

which a miner in the Central Competitive field required to complete a day's work is at least nine hours, for the reason that there is one hour reduction for the lunch period in the middle of the day, and to this time should properly be added such time as was necessary for the miner in the Central Competitive field to go from bank to face and return from face to bank before and after completing his day's work.

"Personally I regret the attitude of the miners' committee and it is unfortunate and entirely unfair that these workmen should be engaged in a strike which has now lasted for four months for the purpose of insisting upon the retention of a war-time bonus which amounts to approximately \$1.17 per man per day. It is, I think, conceded that other classes of labor generally, farmers and business men, have been compelled to relinquish peak war-time bonuses."

## Matthew Addy Co. Goes Into Hands of Receiver

The Matthew Addy Co., Cincinnati, jobbers and brokers in iron, coal and coke, went into the hands of a receiver Sept. 11, dissension among officers and directors having defeated the efforts of a creditors' committee, which for three weeks had been working with a view to reorganizing the company.

"Frozen" assets and the uncertainty of pending litigation, for and against the company, in the state and federal courts, were blamed by attorneys for the company's present financial embarrassment.

The receivership proceedings were brought by the Old Dominion Coal, Iron & Coke Corporation, of Virginia, which charged it was a creditor for \$7,656.70 for coke sold and delivered. Through mutual agreement between the company and a committee representing a number of the larger creditors, John H. Dickerson, former president of the Business Men's Club of Cincinnati, was appointed receiver by Judge Stanley Struble, under \$10,000 bond.

The company, a \$600,000 corporation, is said to have done an annual business of several millions of dollars. The creditors' committee had been working harmoniously toward bringing about a reorganization of the company and to avoid the receivership proceedings. Internal dissension, however, made it impossible to work out an amicable agreement and it was decided at a joint meeting of creditors and officers and directors to allow the company to go into a receivership.

A preliminary audit of the books of the company, attorneys said, showed assets of approximately \$960,000, while its merchandise liabilities were approximately \$525,000. While the books of the company indicate that it was solvent, its actual solvency depended upon what it was able to realize from the sale of its coal and fluorspar properties and the outcome of the pending litigation, it was said.

## Output and Value of Coal from Alabama and Arkansas Mines in 1923

(Compiled by U. S. Geological Survey)

State and County	Loaded at mines for shipment (net tons)	Sold to local trade and used by employees (net tons)	Used at mines for steam and heat (net tons)	Made into coke at mines (net tons)	Total quantity (net tons)	Total value	Average value per ton	Number of employees				Average number of days worked
								Underground	All	Surface	Total	
<b>Alabama</b>								Miners, a	others			
Bibb.....	1,192,795	5,338	28,938	.....	1,227,071	\$3,345,000	\$2.73	1,174	498	392	2,064	207
Blount.....	257,007	1,508	5,000	.....	263,515	667,000	2.53	358	57	99	514	165
Etowah.....	128,118	1,864	2,173	.....	132,155	366,000	2.77	161	25	50	236	302
Jefferson.....	9,410,779	113,367	170,221	55,502	9,749,869	24,562,000	2.52	7,338	3,921	2,288	13,547	254
St. Clair.....	772,016	4,617	26,648	.....	803,281	1,984,000	2.47	503	206	85	794	271
Shelby.....	660,113	4,990	11,374	.....	676,477	2,198,000	3.25	872	339	234	1,445	201
Tuscaloosa.....	974,009	22,577	17,238	203,403	1,217,227	2,742,000	2.25	1,028	423	294	1,745	258
Walker.....	5,898,200	211,965	38,903	.....	6,149,068	15,011,000	2.44	5,619	1,781	1,894	9,294	205
Winston.....	19,736	2,100	.....	.....	21,836	66,000	3.02	44	15	15	74	112
Other counties b.....	169,851	2,428	6,861	.....	179,140	598,000	3.34	207	65	50	322	215
Total, excluding wagon mines.....	19,482,624	370,754	307,356	258,905	20,419,639	51,539,000	2.52	17,304	7,330	5,401	30,035	232
Wagon mines served by rail.....	38,010	.....	.....	.....	38,010	85,000	2.23	.....	.....	.....	.....	.....
<b>Grand Total.....</b>	<b>19,520,634</b>	<b>370,754</b>	<b>307,356</b>	<b>258,905</b>	<b>20,457,649</b>	<b>51,624,000</b>	<b>2.52</b>	<b>.....</b>	<b>.....</b>	<b>.....</b>	<b>.....</b>	<b>.....</b>
<b>Arkansas</b>												
Franklin.....	246,487	1,791	5,763	.....	254,041	845,000	3.33	272	99	241	612	105
Johnson.....	174,110	1,542	4,139	.....	179,791	898,000	4.99	330	170	235	735	78
Logan.....	79,535	3,820	1,171	.....	84,526	521,000	6.16	248	83	44	375	104
Sebastian.....	620,960	1,583	20,174	.....	642,717	2,197,000	3.42	1,180	456	243	1,879	94
Other counties c.....	60,608	4,109	7,450	.....	72,167	524,000	7.26	94	38	21	153	189
Total, excluding wagon mines.....	1,181,700	12,845	38,697	.....	1,233,242	4,985,000	4.04	2,124	846	784	3,754	97
Wagon mines served by rail.....	63,650	.....	.....	.....	63,650	207,000	3.26	.....	.....	.....	.....	.....
<b>Grand total.....</b>	<b>1,245,350</b>	<b>12,845</b>	<b>38,697</b>	<b>.....</b>	<b>1,296,892</b>	<b>5,192,000</b>	<b>4.01</b>	<b>.....</b>	<b>.....</b>	<b>.....</b>	<b>.....</b>	<b>.....</b>

(a) Includes also loaders and shotfirers. (b) Franklin and Marion. (c) Pope, Scott and Washington.



## Standardization Conference To Be Held at Meeting of American Mining Congress

A feature of the annual convention of the American Mining Congress, Sacramento, Cal., Sept. 29 to Oct. 4, will be the National Exposition of Mines and Industrial Equipment. Exhibits will be made by manufacturing concerns from all parts of the country and by the Bureau of Mines, California State Mining Bureau, and county mining organizations of California. The exhibits will include a demonstration of the mine rescue and safety work.

The Pacific Coast office of the Bureau of Mines will stage a demonstration of the effective work which the Bureau is doing in training miners in mine-rescue work and in carrying on a campaign of education for greater safety in mining. A complete cross-section of a mine will be built, which will enable spectators to see a demonstration of a mine explosion and the rescue crew going into the stokes and bringing out injured comrades. In the mine there will be displays of different types of mine equipment and adjoining the working demonstration will be displayed the newest safety devices.

There will be 100 exhibits of the latest types of labor-saving and cost-reducing mechanical equipment.

The program of the fifth national standardization conference, to be held in conjunction with the convention, will include reports on the progress of the Coal Mining Branch of the Standardization Division, American Mining Congress, Warren R. Roberts, national chairman, and of the Mining Correlating Committee, American Engineering Standards Committee, Dr. E. A. Holbrook, chairman. Committee reports by the Coal Mining Branch will include the following: "Underground Transportation," C. E. Watts, Berwind-White Coal Mining Co., chairman; "Mining and Loading Equipment," D. J. Carroll, Chicago, Wilmington & Franklin Coal Co., chairman; "Mine Drainage," Charles H. Matthews, Westinghouse Electric & Mfg., Co., chairman; "Mine Ventilation," C. H. Trik, Jeffrey Mfg. Co., chairman; "Outside Coal-Handling Equipment," James Needham, St. Paul Coal Co., chairman; "Power Equipment," F. L. Stone, General Electric Co., chairman; "Underground Power Transmission," A. B. Kiser, Pittsburgh Coal Co., chairman; "Mine Timbering," R. L. Adams, Old Ben Coal Corporation, chairman.

## Westmoreland Company Starts Big and Modern Mine

A large modern mine, planned for a daily output of 3,500 tons, is being opened up by the Westmoreland Coal Co., Irwin, Pa., in the last large tract of undeveloped Pittsburgh coal in Sewickley Township (Westmoreland County), a holding of 3,000 acres. Many of the details, such as the choice of equipment, are yet pending.

Work has commenced on a three-compartment hoisting shaft, inside dimensions 12 x 34 ft., which will be completely lined with concrete. This shaft, which will be 300 ft. deep, has already been sunk to a depth of 100 ft. Simultaneously with the sinking of the shaft a 12 x 15-ft. two-compartment slope with an upper deck for man travel and a lower deck for materials, has been driven a distance of 200 ft.; its total length will be 900 ft.

In addition to the tippie and other buildings outside construction work will include the erection of a modern mining town for housing all the men to be employed. This new mine will be in operation some time next year.

## C. C. & O. Approves Lease

Directors of the Carolina, Clinchfield & Ohio R.R. approved on Sept. 12 the signing of the joint lease with the Atlantic Coast Line and the Louisville & Nashville for 999 years, as revised by the Interstate Commerce Commission. The lease previously had been approved by the boards of directors of the Atlantic Coast Line and the Louisville & Nashville.

Apparently the Department of Justice has placed the entire controversy with regard to trade-association statistics in cold storage until after the election. While it is regarded as practically certain that the department will take no exception to the association which collects statistics of production and stocks, and communicates only aggregates to its members, it is thought certain that no statement with regard to trade associations will be forthcoming at this time. The strong stand taken by the American Federation of Labor opposing undue limitation of trade-association activities is expected to discourage any demagogic attacks on this type of business activity.

## Sproul Interests Absorb Three Independent Firms In New Anthracite Merger

Special to *Coal Age*

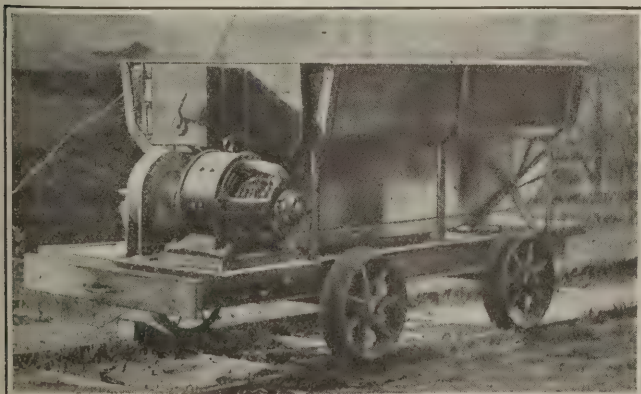
Scranton, Pa., Sept. 16—The Von Storch Collieries Co., the Legitts Creek colliery and the West Ridge colliery, three large independent producers with operations near this city, are to be consolidated to form a new anthracite coal company under the merger planned by former Governor William C. Sproul and a syndicate of financiers, it was learned from authentic sources today. Reports had it that the consolidation would be completed by October, but this was not confirmed by officials of the companies concerned, who said that the merger was now in process of negotiation.

Warren Acker, of Scranton, and associates are the owners of the Von Storch Collieries Co. The Legitts Creek Company is owned by J. P. Burton and Hartman, of New York, and the West Ridge colliery is owned by Frank M. Vandling and others, of this city. Miller-Lynch Company, of New York, and Brown Brothers, of Philadelphia, are handling the negotiations, it is stated.

## Alberta Coal Cannot Go East

Coal from the Province of Alberta will not be marketed in eastern Canada this winter. This announcement was made recently after a conference between Premier Greenfield, of Alberta; Charles Stewart, Minister of the Interior in the Dominion Government, and Sir Henry Thornton, president of the Canadian National Rys. Sir Henry Thornton was unable to meet the joint proposals of the province and the Dominion, contending that the freight charges the operators were prepared to meet, together with the assistance the federal subsidy would insure, were not sufficient to justify the number of cars necessary for the handling of the business, particularly as these cars were urgently required to move grain.

Sir Henry argued that the railway could not move the coal under \$9 a ton, though government experts declared that it could be transported for \$7 a ton. The Dominion Government's subsidy proposed to guarantee the railway against any loss on the \$7 rate. The latter was impossible in the opinion of the Canadian National Ry. and Sir Henry suggested that the boards representing the railway and the government get together with a view to ascertaining whose figures were correct. Subsequently Sir Henry was interviewed by coal operators at Drumheller, and to them he said that, even should the \$7 rate be made effective, the Eastern American coal interests would put up a big fight to retain their market. Why, he asked, could not Drumheller coal be sold in Montana, Oregon and Washington? He was told that what was wanted were steady customers in Ontario.



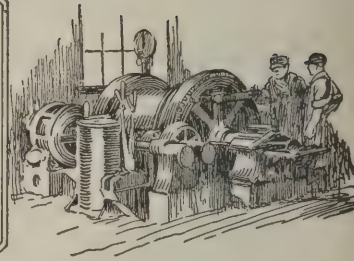
Rock-Dusting  
Car

This car with 5-hp. motor and blower has been built for the Westmoreland Coal Co., for use at its Critterion mine. It will be noted that it is built of steel and is of permanent rather than experimental construction.





## Practical Pointers For Electrical And Mechanical Men



### Electric Lights for Inside and Outside Service at the Mines

Voltage Drops Should Be Kept as Low as Possible So That Lamps  
May Operate Efficiently—Ways to Connect  
Lights to Three-Phase Systems

IN THE past few years the tendency has been more or less to standardize the voltage used for lighting service in and about mines, using the same voltage underground as on the surface. Something of course may be said in favor of standardization, but to use indiscriminately any equipment either above or below ground, without regard to the many different conditions prevailing, is not the way to obtain the best results, neither is it conducive to safety, especially in mining work. Underground lighting systems as a rule are subject to extremely onerous conditions. The chances of leakages and the possibility that fires will result therefrom, are much more numerous than with surface lighting.

When electric light was first introduced into coal mines, the generating plants usually were of small dimensions, and the voltage was low compared with what has become common practice today. One of the principal reasons for employing low pressure, was to guard against leakage, though on account of the inferior character of many of these earlier installations, the danger nevertheless was considerable, and minor outbreaks of fire often occurred. Improvements in wiring methods, equipment and insulation however, soon led to better practices, and engineers gained confidence and so were led to introduce higher voltages.

On the whole these installations despite their higher voltages were safer because, granted suitable insulation was provided, there was the advantage that the current employed varied inversely with the voltage, and therefore reduced the possibilities of heated connections—a frequent source of trouble in the earlier low-voltage lighting installations.

The old carbon-filament incandescent lamp required much more power per candlepower than incandescent lamps of modern type. The original carbon-filament lamps consumed anywhere from 3.5 to 4 watts per candlepower, consequently, when a 16-cp. lamp operated on a 50-volt circuit the current was quite large. In contradistinction the so-called half-watt lamp available today consumes only about one watt per candlepower.

In connection with low-voltage lighting, an important point which must be remembered in laying out an instal-

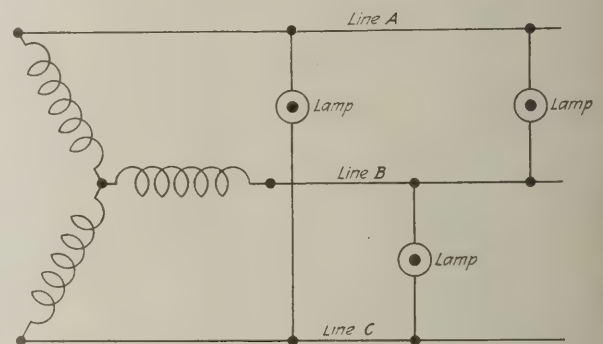
lation is that a comparatively small reduction in voltage causes a marked decrease of candlepower. A small increase in voltage will seriously overrun the rating and reduce the life of low-voltage lamps. Thus a reduction of two volts in the pressure of a 220-volt supply would result in a loss of about 0.8 cp. with a 25 cp. or 30-watt metallic-filament lamp. The same voltage reduction on a 110-volt circuit would reduce the candlepower by over 1.5, and a similar reduction in the pres-

allow a definite drop in volts between the point of supply and the lamps so that a cable of moderate size may be employed without causing undue loss of voltage at the point where the lamps are connected. Thus, assuming that 110 volts are required at the lamps, there is no reason why after calculating the current which will be required, the cable installed should not be of sufficient resistance to allow a reasonable drop of voltage along its length.

Alternating-current lighting systems are far more common today than direct-current, due to the extended use of alternating current for power purposes, which makes it convenient also to employ it for lighting. The use of transformers permits the tapping of power cables at points where lights are required and avoids the necessity for running long lengths of cables carrying

FIG. 1  
Without  
Neutral Wire

When the lamps are supplied from a Y-connected transformer without neutral wire, should the fuse in any wire blow, two-thirds of a previously balanced load will try to take power through the two remaining line wires.



sure of a 25-volt circuit would result in a loss of nearly 7 cp.

Thus the need for maintaining a constant pressure on a low-voltage lighting system will be appreciated. Moreover, from the foregoing figures it will be obvious that these circuits must be calculated from the source of supply to the last lamp if disappointment is to be avoided when a new installation is first lighted. The voltage of a generator supplying a small lighting system may be varied as required within certain limits, but alternating-current lighting circuits, which as a rule are tapped from the main power supply, have to operate at constant voltage, no variation being permissible beyond that provided by connections on the transformer. In this connection reference might be made to instances of low-voltage lighting where for some reason, the supply transformer is at some distance from the lamp.

Fortunately most groups of mine lights are controlled by one main switch, and therefore the load on the transmission line is constant. This being so, the circuit may be arranged to

low-voltage current. Alternating-current lighting for underground use is really more suitable—from an insulation standpoint—than direct current.

It is well known that the negative conductor of a supply has an attraction for moisture and the positive conductor repels it. This is why insulation breakdowns more often occur on the negative wire when it is not directly connected to ground. The advantage of alternating current is that neither conductor attracts moisture, and therefore both conductors can be kept more efficiently insulated. On the other hand, for a given voltage a shock from a direct-current circuit is actually of a lower potential than with alternating-current. Voltages are measured in root-mean-square values and therefore a nominal alternating-current voltage is only about 70 per cent its maximum voltage.

A shock from, say, a 220-volt alternating-current circuit would be more severe than from a direct-current circuit of 220 volts. However, when it comes to using comparatively very low voltages this disadvantage of alternat-



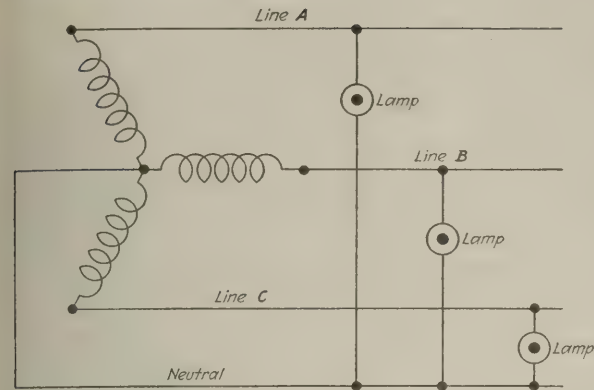


FIG. 2  
**With Neutral Wire**  
When the loads are connected between a line wire and a neutral with a perfectly balanced load the neutral wire carries no current to the transformer. If a fuse blows in any line wire only one-third of the lighting system is out of service.

ing-current which is deserving of consideration when the voltage of a lighting circuit reaches 220 or over, need not be taken into account.

If a lighting load represents a considerable proportion of the three-phase circuit from which it is drawn, the system must be balanced, so that the energy taken from each main of the high-tension supply is approximately the same. Consequently, it is necessary to install three-phase distributing lines and to balance the lights on the secondary side of the transformers. This may be done in a number of ways. Fig. 1, represents the connections of a three-phase transformer star-connected; the lamps being connected across the lines A, B, and C. The primary side of the transformer has been omitted to simplify the diagram. The first lamp should be connected between A and B, the next between B and C and the third between A and C; this sequence of connections being preserved throughout each lighting circuit.

If such a system has the same number of lights connected between each pair of wires A and B, B and C, and A and C, will be balanced. The currents in all three mains on the secondary as well as on the primary side of the transformer will be equal. There is however, one objection to this method in that, should, for instance, the fuse blow in main B, the lamps connected between A and C, will remain lighted with their usual brilliancy, and those connected between A and B and B and C will be in series across A and C as they will have no supply from B. The same, of course, applies in case a fuse should blow in mains A or C. The effect is to maintain every third light on the circuit at full brilliancy, while the others are merely glowing.

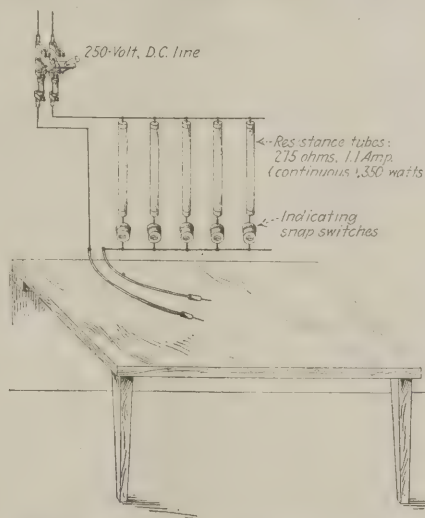
The drawbacks of a circuit such as that shown in Fig. 1 may be overcome by employing four wires; one each from wires A, B and C coming from the transformer, and one from the neutral point as shown in Fig. 2. The quantity of copper in the neutral will need only to be as large as that of the mains, because of the interactions of the three currents in the mains, which are displaced from each other by 120 deg. With this circuit, if a fuse blows, only those lights on the particular supply wire are affected, and if the lamps are consecutively connected from mains A, B and C throughout the system as indicated in Fig. 2, every third light only, will be affected.

If the lighting system is an extensive one, it might be conveniently split into

three separate circuits, each with one main and a neutral wire. In that case, of course, the blowing of a fuse would cut out completely a whole section. This is an obvious disadvantage compared with the systems shown in Fig. 1 and 2 in which the blowing of a fuse would not cause complete darkness in any section.

### Resistance for Testing And Charging

The accompanying sketch illustrates an arrangement of resistance tubes which is a substitute for the familiar



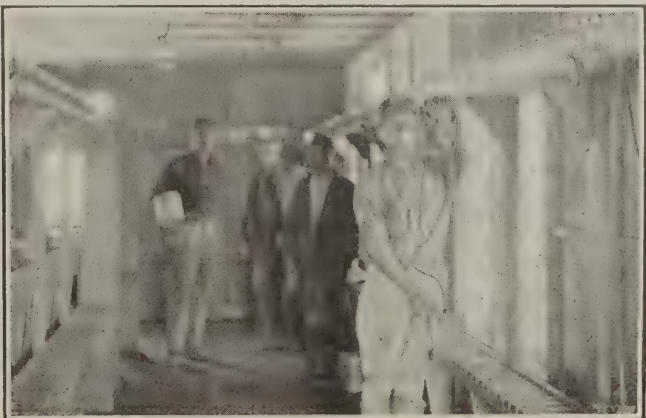
### Resistance Tubes Mounted On Wall

Carrying capacity and ohms resistance of the separate units should be such that a short-circuit of the test points or charging chips will not cause overheating.

lamp bank, now so often used when charging repaired cells of battery

### Lamp Rack at Bon Carbo Mine

Every man can take his own lamp here, as he goes through the check house on his way into the mine, and there is no delay. He returns the lamp to its place when he checks out in the afternoon. In the foreground we see C. R. Garrett, mine superintendent.



locomotives and also radio and automobile batteries.

This form of resistance has several advantages over the lamp bank. The chief reason why it has found favor is that it eliminates the trouble and high cost of replacing lamps. In most lamp-bank installations no method of locking is used and as a consequence the group of lamps often serves as a supply; sometimes even the sockets are removed, all resulting in considerable irritation to the mine electrician. Even if locked the lamp replacements will be frequent, for if used twenty-four hours per day the life of a tungsten lamp is but a few months at best.

Satisfactory resistance tubes can be purchased for approximately \$2.50 each, this being cheaper than sufficient sockets and lamps to provide an equivalent current capacity. The use of 275-ohm units having a capacity of 350 watts each tends to make the resistance foolproof. A single tube or all tubes can carelessly be left shorted across the line and no damage will result. When charging one- to three-cell batteries or testing low-resistance electrical equipment the outfit will supply approximately one ampere for each tube connected into the circuit.

### Here's a Lamp Rack That Saves Time

The business of checking out electric cap lamps to miners going into a mine in the morning and of checking in the lamps again in the evening is rather complicated at some coal mines. All sorts of schemes have been evolved but most of them consume time, because, in most cases, the lamps have to be handed out one by one through a window by one or two clerks. It is different at the Bon Carbo mine of the American Smelting and Refining Co., a few miles back in the hills from the company's big coke plant at Cokedale, Col. There, each man takes his own lamp. He can do it on the run.

A long pair of lamp racks was built on either side of a runway going through the check house near the mine mouth. As the batteries are charged, the lamps are put on this rack, as shown in the accompanying picture. When the miners go through the check house on their way to work, the lamps are so effectively spread out that there is no congestion to speak of and no time is lost over lamps. Each man takes his own.



## Book Reviews

### Pulverized Fuel

SO RAPID has been the progress in the United States of the use of pulverized fuel that we are prone to regard it as a practice devised and developed wholly in America. A little book on "Pulverized Fuel" by W. F. Goodrich may serve to correct that impression. The British, he claims, originated the idea, though he does not appear to have made any examination of American patents. However, we may concede that if he did he would probably only confirm his present conclusions. Nevertheless, it is clearly proved that it remained for the United States to bring the use of pulverized fuel to its present state of relative perfection. This is so clearly recognized by the author that pages 17-92 are given up to United States practice and indeed many other pages in other parts of the book, so that it may be said safely that Mr. Goodrich's volume will find favor in America as it furnishes adequate information about American practice. French and British practice—we use the author's own arrangement—is given secondary place.

#### GOODRICH NOT OVERSOLD

Mr. Goodrich is not to be regarded as an uncritical enthusiast, for he prefaces his book with the statement that "pulverized-fuel firing is not faultless" nor has "every problem in its successful and economic application been solved." He says however that "the principal defect—the emission of fine ash from the chimney—does not present an insuperable difficulty, nor is the discharge of dust from the chimney peculiar to this system of firing; it is in fact an all too common trouble, even with some of the most modern mechanical stokers."

He says in a chapter on the future of pulverized-fuel firing that "it has been suggested by some enthusiastic advocates in the United States that no other fuel or system of firing can compete with pulverized fuel and that existing systems must be quickly superseded. With this the author is not in agreement. There are reasons why under certain conditions and to meet particular requirements, coal will continue to be used on grates. For similar reasons it is extremely unlikely that pulverized fuel will supersede oil firing." We are not certain that Mr. Goodrich is correct, and perhaps this negative attitude, too common in Great Britain, may prevent rapid development in that country. We, in the United States, ride our hobbies energetically—a practice which makes for rapid progress.

The first patent, Mr. Goodrich tells us, was taken out in 1831 and Europe made many attempts to accomplish the objects desired, but wet fuel, poor refractories, incomplete mixing of air and fuel, imperfect pulverization and difficulties with slag seem to have retarded progress, though the Claude Bettington boiler achieved quite a measure of success.

The subjects treated in this little volume are Pulverized Fuel—its origin and history; United States practice; French and British practice, design of equipment and operation; fuels suitable for use in pulverized form and the future of pulverized fuel.

The coal operator should be interested in pulverized fuel systems because they are likely to extend further the use of fine coal. Its economies serve to make the use of the smaller sizes still more profitable and hasten the day when the larger sizes are used no longer for steam boilers. Mr. Goodrich's book is one of the Griffin series of Technological Handbooks and is distributed by J. B. Lippincott Co., of Philadelphia. It measures 5 x 8 in. and has 223 pages.

### The Coal Industry

"DEDICATED in the public interest to the coal industry" or better "dedicated to the public interest in the coal industry." A. T. Shurick has produced a well-rounded, fairly conceived book of a character long desired by the general public, entitled "The Coal Industry." It is not a mass of statistics except in the appendix, but a popular treatise covering a somewhat larger range than the report of the U. S. Coal Commission.

Mr. Shurick has done his work well. He describes the coal industry neither with panegyric or censure. He contents himself with being simply informative. Nothing in the 371 pages of this book suggests propaganda. It is, therefore, the better entitled to the public's favor and acceptance. If the average reader wants to get a clear idea of the industry as a whole he cannot do better than follow Mr. Shurick's review of it in this volume.

#### A FEW HISTORIC BEGINNINGS

A long series of precedents, however, require that the reviewer recite the points in the book reviewed with which he finds himself at issue, even though these shortcomings do not in any measureable way mar the book. We may say, therefore, that in the story of the early beginnings of coal mining, the "embryonic stage" as he terms it Mr. Shurick has passed over most of the states and regions, even of those areas regarding which records are fairly easy of access. In his discussion Mr. Shurick tells us the well-known and romantic story of the opening of the anthracite mines; he gives us details of the early exploitation of the Georges Creek fields and then shifts to West Virginia regarding which, however, he gives an extremely short and fragmentary history.

We are aware that it was his duty to be brief, but to pass over central and western Pennsylvania, Ohio, Illinois, Indiana, Iowa, the Rockies, Washington and Alabama, not to mention

other fields is to fail to cover the history of the beginnings of coal production adequately.

Mr. Shurick on page 54 says of the world-wide advances in mining in the nineteenth century: "The progress in this century, in terms of the results achieved in output, methods of mining, mechanical improvement, etc., relegates that of the preceding centuries to the accomplishments of a merely preparatory stage" and then adds "Certain refinements and improvements in the existing practice are to be anticipated in the course of time, but the succeeding generations will be engaged more in picking up and perfecting the loose ends left over from the sweeping changes of the nineteenth century, and there will never be a recurrence of the revolutionary developments of that time."

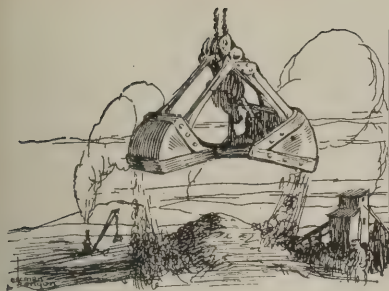
From these passages you would judge the author to be an old man with a natural regard for the developments that took place largely under his eye, but he is not. One cannot understand therefore why he belittles the century that has seen almost his entire labors or having seen such revolutionary changes since the beginning of the century has lost faith that there will be more like them. Since January, 1901, what truly remarkable advances have been made! Mr. Shurick might have accumulated a few dates that would have given him assurance as to the progress that has occurred since that time.

#### NO END TO LANE OF PROGRESS

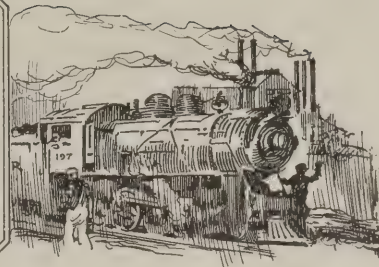
We may add, also, that there is no sign that the industry has come to the end of the long lane. Mr. Shurick himself has given evidence that this gloomy prophesy of his slipped from his pen unawares, for he writes on page 131: "The civil engineer of today would not contemplate the possibility of moving a few hundred tons of dirt without the aid of machinery; what then can be said of an industry that hand shovels seven hundred million tons of coal a year?" Later he adds, "A more difficult problem will be the one of working out a method for the combined mining and loading of the coal. These successive steps suggest to the reader the ideal towards which the industry is striving—the mechanical extraction and transportation of coal from the working face to the railroad car on the surface with human agencies confined to installing, repairing and directing the machinery." He terms these revolutionary ideas and prophesies their accomplishment, yet this is the man who a few pages back said that the age of miracles was at an end, and that the revolutionary advances of the nineteenth century would never be equalled. Should Mr. Shurick live till January, 2001 we promise him that he will be ready to say about the twentieth century what he has said about the nineteenth, unless war and tumult interfere with progress.

The volume has four parts—The Coal Fields, Mining Methods, Distribution of the Coal Mined and Economic and Sociological Conditions. It measures 6 x 9 in., is bound in cloth and costs \$3.50 net. Its publishers are Little, Brown & Co., Boston, Mass.





# Production And the Market



## Growth of Strength in Bituminous-Coal Market Continues Unabated

Gradually but none the less surely the coal business is climbing out of the slough of despond in which it was buried for so long. Though there is nothing spectacular about the upward movement, neither are there the exasperating reactions that usually characterize that type of market. The price gains of the last few weeks not only are being firmly held but quotations continue to show an upward trend. Though resumption of operations at mines that have been idle have not been so numerous during the last week, production is increasing at those that are running, particularly the larger plants. The general revival of business has not developed the vigor expected by many enthusiastic prophets, the increases in many instances being little more than the seasonal fall gains, but more conservative observers take comfort in the belief that the more gradual upturn is certain to be more lasting.

### Railroads Placing Heavy Equipment Orders

One of the most encouraging recent developments is the large volume of orders for new equipment being placed by the railroads, the latest being one for 4,000 open tops by the Illinois Central. This follows closely on the heels of contracts for 1,000 gondolas each by the Chesapeake & Ohio and the Philadelphia & Reading.

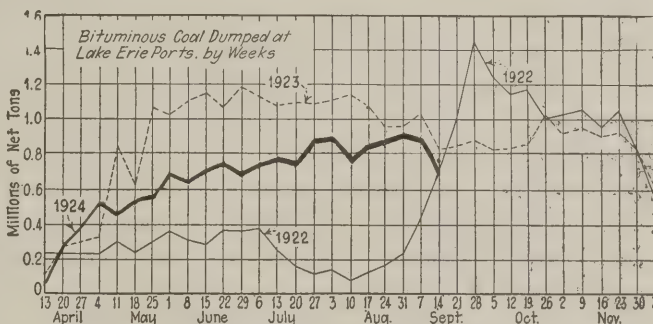
Coal Age Index of spot prices of bituminous coal registered a further advance of one point during the week, standing on Sept. 15 at 167, the corresponding price for which is \$2.02, compared with 166 and \$2.01 respectively on Sept. 8.

There was a slight gain in activity at Hampton Roads last week, dumpings of coal for all accounts for the seven days ended Sept. 11 totaling 338,432 net tons, compared with 327,133 tons handled during the preceding week.

Movement to the lakes, on the other hand, declined, dumpings at Lake Erie ports during the week ended

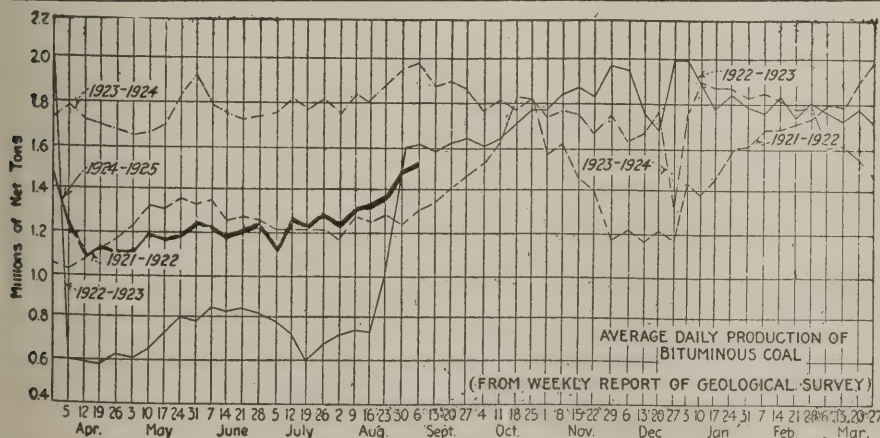
Sept. 14, according to the Ore & Coal Exchange, being as follows: For cargo, 705,606 net tons; for fuel, 42,598 tons, compared with 850,865 and 47,228 tons respectively for the previous week.

Production of bituminous coal declined sharply during the week ended Sept. 6, when, according to the Geological Survey, 7,941,000 net tons was produced, a falling off of 778,000 tons from the week ended Aug. 30, when 8,719,000 tons was the yield, according to revised figures. The decline was due to the observance of Labor Day, so that the average daily output actually gained despite the decrease in total production. A number of



mines operated despite the holiday, the day rating as about one-quarter of a normal Monday. Anthracite output likewise receded, 1,451,000 net tons having been produced, compared with 1,837,000 tons during the previous week.

Increasing strength continues to pervade the anthracite market, orders steadily gaining in volume, though actual business is by no means keeping pace with inquiries. Stove leads the demand, as usual, followed by egg and nut, but pea is showing increased strength and the steam sizes are showing renewed signs of life. Prices are holding firmly.



### Estimates of Production

	(Net Tons)	
	BITUMINOUS	
	1923	1924
Aug. 23.....	11,383,000	8,313,000
Aug. 30 (a).....	11,737,000	8,719,000
Sept. 6 (b).....	10,485,000	7,941,000
Daily average.....	1,997,000	1,510,000
Cal. yr. to date (c)...	376,834,000	302,555,000
Daily av. to date.....	1,790,000	1,433,000
	ANTHRACITE	
Aug. 23.....	2,165,000	1,711,000
Aug. 30.....	1,893,000	1,837,000
Sept. 6.....	3,000	1,451,000
Cal. yr. to date.....	68,360,000	62,238,000
	COKE	
Aug. 30 (a).....	333,000	110,000
Sept. 6 (b).....	345,000	112,000
Cal. yr. to date (c)...	13,478,000	7,094,000

(a) Revised since last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.



### Midwest Prices Higher

The lively demand for lump and egg coal in certain of the Midwest fields has had the inevitable result: Prices are increasing. The Franklin County (Ill.) producers increased their lump, egg and large nuts 25c. this week, so that the 6-in. lump quotation is now \$3.50, egg is \$3.25 and No. 1 nut \$2.90. Saline County followed suit and is trying to get the same price. A few more mines of the region are opening. This is in spite of the fact that weather is warming up and screenings are moving sluggishly at \$1.50@1.75. There is, however, already a suggestion of car shortage in the southern Illinois field. This may maintain the new price. With cars widely scattered just now, with domestic demand exceedingly brisk and with dealers' stocks low in the face of rapid business, it is predicted by some that the region is going to develop car shortages about every two weeks the rest of the autumn.

Central Illinois and the Standard district near St. Louis are both feeling the domestic pick-up. Standard lump already has increased from \$2.35 to \$2.50 and a further jump to \$2.75 is expected if the cool weather holds out. Mt. Olive lump has not been able to pass the \$2.75 price maintained there for several weeks. However, it is strong at that. Nut coal and screenings are hard to move. Standard

screenings are now down to 90c.@\$1. Indiana production has increased a little but prices remain unchanged except for a slight depression of screenings quotations. West Kentucky coal is not getting in on the burst of domestic business in the West and Northwest but east Kentucky, in the Midwest markets, is doing fairly well at \$2.75 for lump though a shortage of flat-bottom cars is a distinct handicap. Prices have to be shaded 25c. in some cases to move the coal in hopper bottoms.

Smokeless coal from West Virginia in the Midwest feels the pick-up too. Lump and egg has moved up a quarter to \$3.75@4. Mine run has lifted its bottom price from \$1.75 to \$1.85 but the top remains steady at \$2. A great volume of this coal saturated the market during the summer.

A little cold wave at St. Louis after a spell of warm weather made the householder wake up and order coal. Orders are mostly for high-grade with a little intermediate grade and very little demand for the cheaper coals. Anthracite, smokeless and coke are moving fairly well. Most of the dealers have a good supply on hand. Wagonload steam picked up this week, but carload steam is slow. The demand is far below the supply. Country domestic is unusually good on account of the change in weather, and this is going to be the cause of higher prices as the result of a demand for lump everywhere. Country steam is quiet.

### Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern					Midwest						
	Market Quoted	Sept. 17 1923	Aug. 30 1924	Sept. 8 1924	Sept. 15 1924		Market Quoted	Sept. 17 1923	Aug. 30 1924	Sept. 8 1924	Sept. 15 1924
Smokeless lump.....	Columbus....	\$5.95	\$3.60	\$3.60	\$3.50@3.75	Franklin, Ill. lump.....	Chicago.....	\$4.05	\$3.10	\$3.10	\$3.25@3.50
Smokeless mine run.....	Columbus....	3.00	3.00	2.00	1.85@2.15	Franklin, Ill. mine run.....	Chicago.....	3.00	2.35	2.35	2.25@2.50
Smokeless screenings.....	Columbus....	2.35	1.20	1.20	1.15@1.30	Franklin, Ill. screenings.....	Chicago.....	1.55	1.65	1.65	1.60@1.75
Smokeless lump.....	Chicago.....	6.10	3.60	3.60	3.75@4.00	Central, Ill. lump.....	Chicago.....	3.00	2.60	2.60	2.50@2.75
Smokeless mine run.....	Chicago.....	2.85	1.85	1.85	1.85@2.00	Central, Ill. mine run.....	Chicago.....	2.20	2.20	2.20	2.15@2.25
Smokeless lump.....	Cincinnati...	6.10	3.75	3.75	3.75@4.00	Central, Ill. screenings.....	Chicago.....	1.20	1.55	1.55	1.35@1.60
Smokeless mine run.....	Cincinnati...	3.00	1.85	1.85	1.75@2.00	Ind. 4th Vein lump.....	Chicago.....	3.35	2.85	2.85	2.75@3.00
Smokeless screenings.....	Cincinnati...	2.25	1.35	1.35	1.25@1.50	Ind. 4th Vein mine run.....	Chicago.....	2.60	2.35	2.35	2.25@2.50
*Smokeless mine run.....	Boston.....	5.05	4.15	4.10	4.10@4.20	Ind. 4th Vein screenings.....	Chicago.....	1.45	1.65	1.65	1.50@1.70
Clearfield mine run.....	Boston.....	2.15	1.90	1.90	1.45@2.35	Ind. 5th Vein lump.....	Chicago.....	2.75	2.50	2.50	2.40@2.65
Cambria mine run.....	Boston.....	2.85	2.30	2.25	1.90@2.60	Ind. 5th Vein mine run.....	Chicago.....	2.10	2.10	2.10	2.00@2.25
Somerset mine run.....	Boston.....	2.35	2.05	2.05	1.75@2.35	Ind. 5th Vein screenings.....	Chicago.....	1.25	1.50	1.50	1.40@1.50
Pool 1 (Navy Standard).....	New York....	3.25	2.70	2.75	2.50@3.00	Mt. Olive lump.....	St. Louis....	3.10	2.85	2.85	2.75
Pool 1 (Navy Standard).....	Philadelphia..	3.25	2.40	2.40	2.35@2.50	Mt. Olive mine run.....	St. Louis....	2.25	2.50	2.50	2.50
Pool 1 (Navy Standard).....	Baltimore....	2.25	2.65	2.60	2.35@2.85	Mt. Olive screenings.....	St. Louis....	1.35	1.75	1.75	1.75
Pool 9 (Super. Low Vol.).....	New York....	2.50	2.15	2.10	1.90@2.35	Standard lump.....	St. Louis....	2.80	2.15	2.15	2.50@2.65
Pool 9 (Super. Low Vol.).....	Philadelphia..	2.65	2.15	2.15	1.95@2.35	Standard mine run.....	St. Louis....	2.05	1.80	1.80	1.75@1.85
Pool 9 (Super. Low Vol.).....	Baltimore....	2.45	1.85	1.85	1.80@1.90	Standard screenings.....	St. Louis....	.95	1.20	1.20	.90@1.00
Pool 10 (H.Gr. Low Vol.).....	New York....	2.15	1.95	1.80	1.65@2.00	West Ky. lump.....	Louisville..	2.35	2.25	2.45	2.50@2.75
Pool 10 (H.Gr. Low Vol.).....	Philadelphia..	2.20	1.75	1.75	1.65@1.90	West Ky. mine run.....	Louisville..	1.95	1.60	1.60	1.50@1.75
Pool 10 (H.Gr. Low Vol.).....	Baltimore....	2.25	1.55	1.60	1.55@1.70	West Ky. screenings.....	Louisville..	.80	1.30	1.30	.90@1.15
Pool 11 (Low Vol.).....	New York....	1.85	1.65	1.60	1.40@1.85	West Ky. lump.....	Chicago.....	2.75	2.30	2.35	2.25@2.65
Pool 11 (Low Vol.).....	Philadelphia..	2.10	1.45	1.45	1.35@1.60	West Ky. mine run.....	Chicago.....	1.95	1.60	1.60	1.35@1.95
Pool 11 (Low Vol.).....	Baltimore....	2.00	1.45	1.45	1.40@1.50						
High-Volatile, Eastern					South and Southwest						
Pool 2-64 (Gas and St.)...	New York....	1.75	1.50	1.50	1.40@1.65	Big Seam lump.....	Birmingham...	3.75	3.15	3.10	3.00@3.25
Pool 54-64 (Gas and St.)...	Philadelphia..	1.85	1.50	1.50	1.40@1.60	Big Seam mine run.....	Birmingham...	1.95	1.75	1.75	1.50@2.00
Pool 54-64 (Gas and St.)...	Baltimore....	1.75	1.35	1.35	1.35@1.40	Big Seam (washed).....	Birmingham...	2.35	2.00	2.00	1.75@2.25
Pittsburgh so'd gas.....	Pittsburgh...	2.95	2.40	2.40	2.30@2.50	S. E. Ky. lump.....	Chicago.....	3.35	2.30	2.50	2.25@2.75
Pittsburgh gas mine run.....	Pittsburgh...	2.50	2.10	2.10	2.00@2.25	S. E. Ky. mine run.....	Chicago.....	1.85	1.60	1.60	1.50@1.75
Pittsburgh mine run (St.)...	Pittsburgh...	2.25	1.85	1.85	1.75@2.00	S. E. Ky. lump.....	Louisville....	3.10	2.25	2.50	2.25@2.75
Pittsburgh slack (Gas)....	Pittsburgh...	1.50	1.30	1.35	1.30@1.40	S. E. Ky. mine run.....	Louisville....	2.00	1.50	1.50	1.25@1.75
Kanawha lump.....	Columbus....	3.15	2.10	2.10	2.00@2.25	S. E. Ky. screenings.....	Louisville....	1.05	.95	1.00	.85@1.00
Kanawha mine run.....	Columbus....	1.90	1.40	1.40	1.30@1.55	S. E. Ky. lump.....	Cincinnati...	3.35	2.50	2.50	2.25@2.75
Kanawha screenings.....	Columbus....	1.25	1.05	1.10	1.00@1.10	S. E. Ky. mine run.....	Cincinnati...	1.55	1.45	1.45	1.25@1.65
W. Va. lump.....	Cincinnati...	3.60	2.25	2.35	2.15@2.60	S. E. Ky. screenings.....	Cincinnati...	1.00	.95	1.00	1.00@1.10
W. Va. gas mine run.....	Cincinnati...	1.60	1.45	1.50	1.35@1.60	Kansas lump.....	Kansas City...	4.50	4.50	4.50	4.50
W. Va. steam mine run.....	Cincinnati...	1.60	1.35	1.35	1.25@1.50	Kansas mine run.....	Kansas City...	3.50	3.50	3.50	3.50
W. Va. screenings.....	Cincinnati...	1.05	.90	.90	1.00@1.10	Kansas screenings.....	Kansas City..	2.60	2.50	2.50	2.50
Hooking lump.....	Columbus....	3.10	2.40	2.40	2.25@2.55						
Hooking mine run.....	Columbus....	1.95	1.55	1.55	1.45@1.65						
Hooking screenings.....	Columbus....	1.20	1.05	1.15	1.10@1.25						
Pitts. No. 8 lump.....	Cleveland...	2.60	2.40	2.35	2.00@2.60						
Pitts. No. 8 mine run.....	Cleveland...	2.05	1.80	1.85	1.80@1.90						
Pitts. No. 8 screenings.....	Cleveland...	1.25	1.10	1.20	1.10@1.25						

\* Gross tons, f.o.b. vessel, Hampton Roads.

† Advances over previous week shown in heavy type declines in italics.

\* Gross tons, f.o.b. vessel, Hampton Roads.

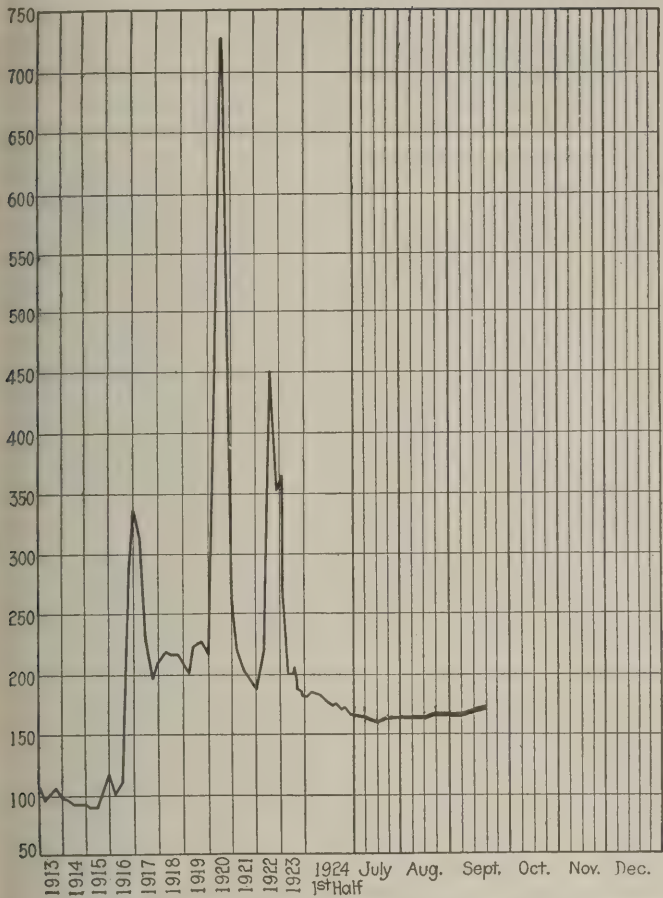
† Advances over previous week shown in heavy type, declines in italics.

### Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

		Sept. 17, 1923	Sept. 8, 1924		Sept. 15, 1924†	
	Market Quoted	Freight Rates	Independent	Company	Independent	Company
Broken.....	New York.....	\$2.34				
Broken.....	Philadelphia.....	2.39				
Egg.....	New York.....	2.34				
Egg.....	Philadelphia.....	2.39				
Egg.....	Chicago*	5.06				
Stove.....	New York.....	2.34				
Stove.....	Philadelphia.....	2.39				
Stove.....	Chicago*	5.06				
Chestnut.....	New York.....	2.34				
Chestnut.....	Philadelphia.....	2.39				
Chestnut.....	Chicago*	5.06				
Pea.....	New York.....	2.22				
Pea.....	Philadelphia.....	2.14				
Pea.....	Chicago*	4.79				
Buckwheat No. 1.....	New York.....	2.22				
Buckwheat No. 1.....	Philadelphia.....	2.14				
Rice.....	New York.....	2.22				
Rice.....	Philadelphia.....	2.14				
Barley.....	New York.....	2.22				
Barley.....	Philadelphia.....	2.14				
Birdseye.....	New York.....	2.22				

\* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.





Index	1924			1923
	Sept. 15	Sept. 8	Aug. 30	Sept. 17
Index	167	166	164	202
Weighted average price	\$2.02	\$2.01	\$1.99	\$2.44

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke; 1913-1918," published by the Geological Survey and the War Industries Board.

### Heavier All-Round Demand in Kentucky

Chilly weather throughout the Central States and extending well into the South, with light frosts on the night of Sept. 9 at Louisville, has brought about a lot of demand for coal, coming from domestic consumers, retailers and some industrial buyers. Railroad consumption is picking up a bit account of the usual fall increase in tonnage, while gas companies are using more fuel, and longer nights and heavier industrial loads are creating better demand from the power and lighting concerns. Domestic consumers who have been putting off their buying are now coming into the market heavily.

Both eastern and western Kentucky screenings are weaker, \$1 being fairly close to the top of the market for either field. Eastern Kentucky quotes 85c. to \$1, and western Kentucky, from 90c. to \$1 and slightly over. It is understood that some utility business is to be had at 85c., and that it is going to be filled at that figure.

Eastern Kentucky mines are quite busy in some sections, and it is said that additional train crews are being put on by the Louisville & Nashville R.R. in the Harlan, Hazard and Elkhorn sections, due to increased running time of mines generally and the fact that a number that were idle have recently resumed.

Peak prices on quotations range as high as \$3 by some eastern Kentucky operators on fine grades of block coal, but not many are asking over \$2.75, and there is not much movement at over \$2.50. It is believed in some circles, however, that best coal in both eastern and western Kentucky will be at \$3 before the end of the month.

### Northwest Comes to Life

A better movement of coal to the docks from lower lake ports and a continued firmness in prices characterize the market at Duluth. The anthracite market is strong, and the soft-coal market, while it has not as yet proven sensational, is gaining surely. Prices are firm but unchanged.

Shipments from the Head-of-the-Lakes docks were better in August than in July. In all 18,589 cars went out, as compared with 15,301 in July and 23,914 in August of last year. Dock receipts in August were 1,537,190 tons, of which 351,320 were hard coal and 1,185,870 were soft coal. Total receipts until Sept. 1 are 949,470 tons of hard coal and 4,099,843 tons of soft coal. The hard coal showed an increase over July for last month's receipts of 112,000 tons. For the season until Sept. 1 hard coal shows an increase of 35,152 tons and the bituminous coal a decrease of 2,878,316. It must be taken into consideration that this year started with 4,000,000 tons of coal on the docks whereas last year the docks were bare.

Wholesalers in Milwaukee are in better spirits because of a marked improvement in the volume of orders and consequent acceleration of the movement of fuel from their docks to local bins and to interior dealers. One of the larger dock companies reports orders more than 50 per cent improved over the immediate past.

Receipts of anthracite thus far in September total 25,221 tons and of bituminous coal 99,400 tons. The receipts in Milwaukee up to and including Aug. 31 total 497,223 tons of anthracite and 1,314,210 tons of bituminous coal. Last year the receipts for the same period were 601,462 tons of anthracite and 1,823,193 tons of bituminous coal. Such fluctuations are not unusual.

### Western Markets Active

Kansas coal is moving in steadily increasing volume, and inquiries from dealers are increasing daily. Oklahoma production, however, still is low, partly due to labor disputes and partly to a weak demand. Arkansas semi-anthracite lump is moving well, as householders and institutions begin to lay in their winter's supply, but it has not been necessary to reopen more mines to supply the demand. Screenings, produced in limited quantities, are moving readily. No changes in price have been announced.

A much better feeling pervades the Colorado market due to a noticeable increase both in working time and production. Orders for all sizes are coming in more steadily now and a heavy season is anticipated soon. According to the operators' reports, mines worked on an average of twenty hours last week with only 30 per cent of lost time attributable to "no market." This is 10 per cent less than for any week since May. Prices are unchanged since Sept. 1.

In Utah mines are making better time but are still below 50 per cent of full-time capacity. There is a slightly better demand for coal from industries, and the retail business is in good shape. "Business is better than it was a year ago and so are collections" is the report of practically all of the more important retailers in Salt Lake City. Retail prices are unsettled. The tendency is upward.

### Ohio Markets Brace Up

Cooler weather has helped enormously to brace up the Cincinnati market during the past ten days, putting life in the domestic list that has not been seen in months. Standing orders that have been suspended for weeks suddenly came to life, and while the advance in price was a little slow in some places, brokers and wholesalers who had supplies were able to hold firm on an immediate advance. Smokeless prepared sizes benefited perhaps more than any others. Low-volatile run of mine shows little betterment, but there is a heavier inquiry for screenings. With the upturn in price lake buyers show greater interest in bituminous. This has resulted in a little better position on 2 in. and 4 in., but egg is still inclined to drag. Practically no change has been made in retail prices.

A much better demand for domestic sizes has developed at Columbus. Retail prices are steady at former levels. Steam buying is restricted to immediate needs, but general industrial conditions are improving steadily and buying is expected soon. Some cheap coal is still available but demurrage cargoes are less numerous. Screenings continue strong despite the better output of lump. Lake trade is going along smoothly but the southern Ohio field is not sharing to any extent.



The Cleveland market shows no change—the healthier demand continues more or less in the steam trade, but, if anything, it is not quite so keen as it was a few weeks ago when screenings were 10c. a ton above present quotations. The retail trade, however, is active, but a large part of this trade is confined to smokeless fuels from Southern fields as well as domestic coals prepared in Ohio. Manufacturers and industries in general are laying by some fuel and current requirements are increasing with the improvement in general business conditions.

### Pittsburgh Market Stiffens

Production in the Pittsburgh district is now averaging above 40 per cent, having increased from less than 20 per cent in June, due to exhaustion of stocks and increased consumption. Further increase is looked for soon in domestic coal. Shipping in general is restricted to the area in which it has distinct freight advantages over the non-union fields, which greatly undersell it on the basis of f.o.b. mine prices. Prices have stiffened slightly.

Business at Buffalo is slightly better. Stockpiles have run down considerably. Slack has started up a trifle, gas slack especially, which usually is 10c. or so higher than steam. Quotations are \$2.25@\$2.50 for Youghiogheny gas lump, \$2@\$2.25 for Pittsburgh and No. 8 steam lump, \$1.75@\$2 for all mine run and \$1.10@\$1.35 for slack.

### New England Sees Improvement

Although there has not been any conspicuous expansion in sales, the New England tidewater bituminous market has developed a slightly firmer tendency in prices, \$5.35 gross ton on cars now being as low as is openly quoted for strictly pool 1 run of mine coal. Some business has been taken at \$5.25, but only where the business was particularly desirable.

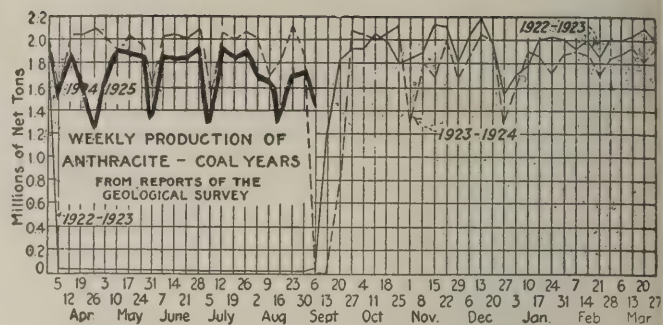
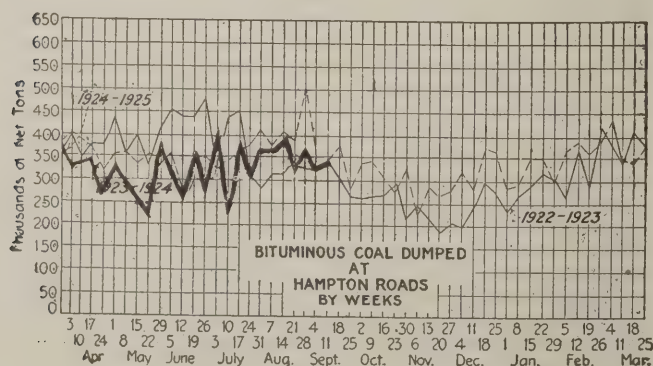
Quotations for strictly navy standard coal at the southern loading piers have been fully maintained at \$4.10@\$4.20 gross ton, f.o.b. Norfolk although some tonnage of "good coal" has been offered at 5c. or so under this low figure. The spot market at Mystic Wharf has improved the past week in that although receipts have been fairly heavy, there has been less coal to dispose of after arrival and this has helped the price situation not a little.

The price situation at Providence also has improved. After some sales to clean up cargoes at \$5.30 on cars, \$5.35 is again the low quotation with some shippers firmly holding for \$5.40.

The all-rail phase of the market offers little new. New orders are practically nil. Wherever a price is quoted, it seems to be at the level that has obtained for many weeks, although so far as New England is concerned Pennsylvania coal is a matter of little interest.

### Atlantic Markets Picking Up Strength

Demand at New York is slowly improving. More orders are being received, but they fail to keep pace with inquiries. The latter are increasing rapidly. Large consumers are showing a desire to replace their reserves and not a few appear ready to close contracts extending to April 1 next. Business is quickening and operators and shippers are exceedingly optimistic. Local operators report some mines reopening, others being prepared for operation, while still others that have been working part time are extending their working schedule. There is a good demand for high-volatile coals and for slack, the latter being quoted around \$1.25.



The Philadelphia market is holding firmly the slight gains made during the past two or three weeks. The interest of the small consumer seems to be maintained and the occasional cars resulting represents about the entire increase in tonnage moved. There also is definite evidence of improvement in general industry. The railroads are increasing their orders, especially on contracts made earlier in the season.

A better line of inquiry is developing at Baltimore. It has not been pronounced enough to touch prices; as a matter of fact some sales were made last week even slightly below those of previous weeks. Despite rumors of a revival in the export situation the first eleven days of September show a falling off as compared with the same period of August.

### Anthracite Demand Gains Steadily

Demand for hard coal is increasing at New York, retailers reporting many new orders. Independent operators are easily disposing of output on about last week's price basis, much being sold at the maximum figures. Retail dealers throughout the Greater City last week followed the lead of the operators and advanced their prices, domestic coals ranging from \$14 to \$14.50. Stove is in strongest demand, though egg and nut are moving well. Pea coal is gaining strength and a large tonnage is handled in this market. The steam sizes are in better call. Rice coal is scarce with some producers, while barley is maintaining its strength.

The forward movement continues at Philadelphia. Retailers report that the consumer is ordering lightly, taking only one and two-ton lots. Producers seem to find a market for all sizes, as full time at the mines is now the rule. There has been no change in retail prices, although it is not thought that an increase will be much longer deferred.

Conditions at Baltimore are about seasonal. Following the Sept. 1 raise in price at both wholesale and retail there is a natural period of slow buying until cold weather is almost at hand. Yards are pretty well stocked and there will be no great difficulty in taking care of early demand at least.

Trade is setting in at a fair rate at Buffalo, buying now being much better. The supply is good, but it is not up to the demand for stove.

Toronto dealers have advanced prices from \$15 to \$15.50 per ton, explaining the increase as due to higher prices demanded by producers in the United States. The wholesale price has been rising at the rate of 10c. a ton for some time, but as the volume of business has been small the dealers had up to the present absorbed this increase.

Furnace coke contracting for fourth quarter at Connellsville is lagging. The spot market is quotable at \$3@\$3.10 as formerly, but most of the little tonnage that moves probably goes at \$3. Small lots sales have brought \$3.10 and occasionally in exceptional circumstances \$3.15. Foundry coke continues decidedly dull and there is some coke offered at under \$4, possibly not gradable up to standard. The market remains quotable at \$4@\$4.50.

### Car Loadings, Surpluses and Shortages

	Cars Loaded			
	All Cars	Coal Cars	Surplus Cars	Car Shortage
Week ended Aug. 30, 1924.....	1,020,339	168,584		
Previous week.....	982,248	159,814		
Week ended Aug. 30, 1923.....	1,092,150	206,578		
			All Cars	Coal Cars
Aug. 31, 1924.....	231,677	111,254	274	
Aug. 22, 1924.....	258,271	119,338	190	
Sept. 1, 1923.....	66,559	3,922	9,441	4,891



# Foreign Market And Export News

## Prices Firm in Fair British Market; More Collieries Close

The steam-coal market in Wales is in a fairly favorable position and prices are firmly held, not on account of the number of orders but because available supplies have been materially decreased by the closing down of more collieries, especially in the Monmouthshire district. The other grades of coal are very irregular, and in every case supply exceeds demand. In most cases slight concessions are available for immediate shipment, but operators are holding present prices for forward quotations.

The steam-coal market in Newcastle is fluctuating and is generally weaker, though gas coals are in fair demand. The inquiry from Europe has revived somewhat. The Lithuanian State Railways have booked 60,000 tons of Yorkshire steams for April-September shipment, and the Swedish State Railways have been inquiring for 30,000 tons of best steams for September-December delivery.

Production by British collieries during the week ended Aug. 30, a cable to *Coal Age* states, was 5,113,000 tons, according to official reports. This compares with an output of 5,279,000 tons during the preceding week.

Total output in the first six months of 1924 was 139,062,000 tons, compared with 140,792,000 tons for the corresponding period of 1923.

Coal exports during the first six months of this year amounted to 31,131,000 tons, valued at £38,003,000. In addition to direct exports, 8,698,000 tons of coal was furnished to foreign shipping, making the total quantity shipped 39,829,000 tons, compared with total shipments in the first six months of 1923 of 48,927,000 tons.

### Hampton Roads Market Holds Fairly Steady

Little change is to be noted in business at Hampton Roads, bunker trade apparently contributing the bulk of business at the piers. The market is

fairly steady and the outlook somewhat better for increased movement.

Brazil and Italy are getting the bulk of foreign movement on contract with a limited number of shippers, but this movement is having little effect on the market. Accumulations at tidewater are slightly on the increase, and reports from the fields indicate a somewhat better production in anticipation of increase in trade.

The tone of the market is not strong, and forecasts of better business hold little hope of material improvement this month.

### French House Coal in Good Call, Moderate Industrial Demand

The French market is still quiet with only a moderate demand for industrial coals, owing to the slackening of activity in various industries. The sugar plants, however, have large requirements for coal, due to the promising outlook.

Up to now the Nord and Pas-de-Calais collieries have been helped little by the strikes in the Borinage coal field in Belgium, though they are shipping sizable tonnages toward the frontier region. Stocks, on the whole, are not very important.

The trend of sales in house coals is good. The Nord and Pas-de-Calais are establishing their price-list for October. Belgian producers are awaiting for the action of the French collieries to fix their prices accordingly.

Imports of British coals, which had dropped during the first two weeks of August, were larger during the second fortnight. The anthracite grades are nevertheless still too high in price at the shipping docks to attract the attention of buyers. Consequently, the inquiry is meager and few disposals are obtainable from the crushing plants in Rouen.

The Paris market is literally flooded with offerings of German coal for free sale, for which attractive rates are

quoted; for instance, 120 fr. per ton, at pit, for semi-bituminous nuts and cobbles. Even where the cost of transportation to Paris is added—about 66 fr. per ton—the rate is still sufficiently attractive to induce traders to buy.

Output of coal from the Sarre mines totaled 1,047,304 metric tons for the month of June last as against 1,164,904 tons during the month of January. The average daily production dropped from 703 kilogrammes per man in January to 693 kilogrammes per man in June.

### Export Clearances Week Ended Sept. 13, 1924

FROM HAMPTON ROADS	
For Brazil:	Tons
Br. Str. Willaston for Rio de Janeiro	7,447
Braz. Str. Lages for Pernambuco	5,572
Ital. Str. Salvore for Rio de Janeiro	7,448
Br. Str. Essex Envoy for Rio de Janeiro	6,654
For Canada:	
Ital. Str. Armando for Montreal	7,009
For Chile:	
Amer. Str. Republic for Antofagasta	781
For Italy:	
Amer. Str. West Mahomet for Genoa	5,042
For West Indies:	
Nor. Str. Marita for Curacao	2,595
Br. Str. Athelston for Port of Spain	306

FROM PHILADELPHIA	
For Newfoundland:	
Br. Schr. W. N. Reinhardt, for St. Johns	—
For Brazil:	
Br. Str. Dalworth, for Rio de Janeiro	—
FROM BALTIMORE	
For France:	
Belg. Str. Caledonier, for Dunkirk	7,422
For Chile:	
Br. Str. Trafalgar, for San Antonio (coke)	4,018

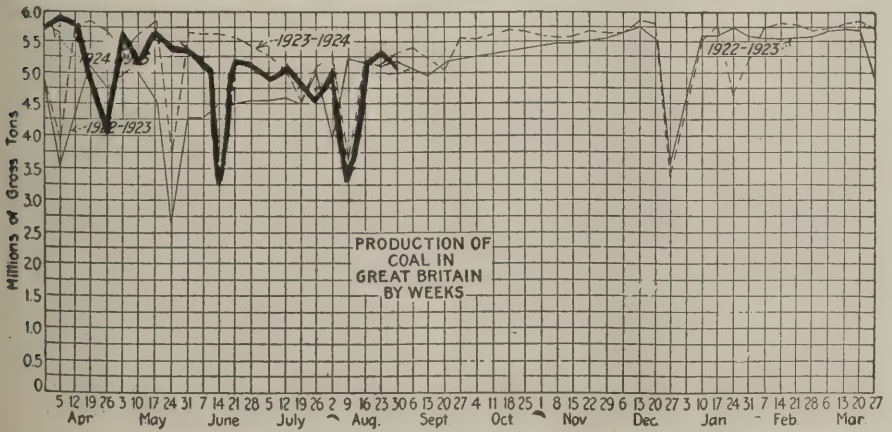
Hampton Roads Pier Situation			
N. & W. Piers, Lamberts Pt.:		Sept. 4	Sept. 11
Cars on hand.....	1,537	1,757	
Tons on hand.....	93,619	110,648	
Tons dumped for week.....	100,851	101,861	
Tonnage waiting.....	9,000	7,000	
Virginian Piers, Sewalls Pt.:			
Cars on hand.....	1,285	1,300	
Tons on hand.....	92,400	90,600	
Tons dumped for week.....	101,362	112,464	
Tonnage waiting.....	22,048	2,207	
C. & O. Piers, Newport News:			
Cars on hand.....	1,895	2,012	
Tons on hand.....	104,430	107,985	
Tons dumped for week.....	90,763	87,847	
Tonnage waiting.....	2,815	2,150	

Pier and Bunker Prices, Gross Tons			
PIERS			
		Sept. 6	Sept. 13†
Pool 9, New York....	\$4.60@ \$5.00	\$4.60@ \$5.00	
Pool 10, New York....	4.50@ 4.75	4.50@ 4.75	
Pool 11, New York....	4.25@ 4.50	4.25@ 4.50	
Pool 9, Philadelphia....	4.90@ 5.25	4.90@ 5.25	
Pool 10, Philadelphia....	4.45@ 4.70	4.45@ 4.70	
Pool 11, Philadelphia....	4.30@ 4.50	4.30@ 4.50	
Pool 1, Hamp. Roads....	4.10	4.00@ 4.15	
Pool 2, Hamp. Roads....	4.00	3.90	
Pools 5-6-7 Hamp. Rds.	3.85	3.85@ 3.90	
BUNKERS			
Pool 9, New York....	4.90@ 5.30	4.90@ 5.30	
Pool 10, New York....	4.80@ 5.05	4.80@ 5.05	
Pool 11, New York....	4.55@ 4.80	4.55@ 4.80	
Pool 9, Philadelphia....	4.90@ 5.25	4.90@ 5.25	
Pool 10, Philadelphia....	4.75@ 4.95	4.75@ 4.95	
Pool 11, Philadelphia....	4.50@ 4.70	4.50@ 4.70	
Pool 1, Hamp. Roads....	4.20	4.15	
Pool 2, Hamp. Roads....	4.10	4.00	
Pools 5-6-7 Hamp. Rds.	3.95	3.90	

### Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations by Cable to Coal Age			
Cardiff:	Sept. 6	Sept. 13†	
Admiralty, large.....	28s. 6d. @ 29s.	28s. 6d. @ 29s.	
Steam smalls.....	17s.	17s.	
Newcastle:			
Best Steams.....	18s. @ 18s. 6d.	18s. @ 19s. 3d.	
Best Gas.....	22s. 6d.	19s. 6d. @ 23s.	
Best Bunkers.....	20s.	18s. @ 19s.	

†Advances over previous week shown in heavy type, declines in italics.







## News Items From Field and Trade



### ALABAMA

The annual First-Aid meet in Birmingham will be held Oct. 7 at Rickwood Field. An interesting program is being prepared, which will be under the direction of the Alabama Mining Institute and local Bureau of Mines officials.

### COLORADO

The superintendents' club of the Colorado Fuel & Iron Co. held a fish fry at Stonewall, where the company maintains a summer place for its employees, on Saturday, Sept. 6.

### ILLINOIS

General Joseph B. Sanborn, 67, head of the J. B. Sanborn Co., a coal credit agency in Chicago, was married Sept. 4 in Chicago to Miss Willa Weck. General Sanborn served through the World War and has long been a well-known figure in the coal trade.

The Missouri Pacific R.R. is constructing a four-mile spur switch from Benton to Mine No. 1 of the Chicago, Wilmington & Franklin Coal Co., better known as Orient No. 1. The company expects to also extend the line to Orient No. 2 at a near date.

Now that Mine No. 9 of the Consolidated Coal Co. of St. Louis has been abandoned the famous Big Muddy coal is almost extinct. The only remaining mine in the Muddy field of seams No. 1 and No. 2 is mine No. 10 of the same company.

The Jewel Coal & Mining Co. has again reopened its No. 2 mine at Duquoin with prospects of operating steadily throughout the winter. The Gale Coal Co., which is the name of the new strip-mining company recently organized by the Crerar-Clinch interests of Chicago and located at Duquoin, also is running full capacity and within a few months will be producing a large tonnage daily.

According to a recent report of Mine Inspector Edward Flynn, of Perry County, the Paradise Coal & Coke Co. produced the greatest tonnage in his district in the last fiscal year, with a total of 384,048 tons. The Majestic Coal & Coke Co. was second with 354,496 tons, the Perry County Coal Co., third with 231,529 tons, and the Security Coal & Mining Co., fourth with 194,519 tons.

The ballot for the Illinois state miners' election in December is the longest in the history of the organization mainly because the last convention stripped President Frank Farrington

of much appointive power. Candidates for president against Farrington are John Hindmarsh, of Riverton, avowed radical, and William J. Sneed, of Herrin, sub-district president and state Senator.

Two first-aid teams of the Superior Coal Co. won first and second places in the big first-aid meet held at Gillespie on Labor Day. No. 10 team, captained by James Boston, won first with a perfect score, after a play-off with No. 13 team, under James Struthers, which had previously tied it. Third prize went to Team No. 4, Edward Daech, captain, from Maryville. Eighteen teams took part. Cash prizes amounted to \$920, each team receiving at least \$20. The meet was made possible through contributions by coal companies of the region, by citizens of Gillespie and by the United Mine Workers. It replaced the Illinois state meet, which was not held this year because of the failure of coal operators to support it financially.

### IOWA

A new coal mine, southeast of Colfax, known as the Hopkins City mine, will soon be in working order and mining operations begun.

### KANSAS

Two hundred Leavenworth coal miners who had been idle throughout the summer months went to work last week, according to an announcement by C. N. Fish, superintendent of the Home mines.

A move recently started to effect "100 per cent unionization" of District 14 by the United Mine Workers of the district has been halted to await a decision by the international board in regard to giving financial aid to non-union workers who quit open-shop mines to join the organization.

### KENTUCKY

The West Kentucky Coal Bureau, which has not met for a couple of months, was scheduled to resume meetings on Sept. 9.

J. C. Hanna, who has been manager at Louisville for the Scanlon Thompson Coal Co., has resigned to join the sales force of the Atlas Coal Co., Louisville. The Scanlon Thompson interests are installing a Godfrey conveyor and wooden hopper system for handling coal in the local yard.

The Kentucky state banking commission, blue sky department, has author-

ized the sale in Kentucky of a part of the \$13,000,000 of securities of the Old Ben Coal Corporation, of Illinois, under an agreement for financing with the National City Co., Chicago, in which twenty-year 6 per cent first-mortgage bonds and ten-year 7½-per cent debentures are to be sold.

The Empire Coal Co., Empire, recently suffered a fire loss amounting to about \$30,000.

It is reported from Middlesboro that the Congress mines have resumed after a shutdown of seven months, and that the Climax mines, which had been down for some weeks, would resume in ten days, while the Yellow Creek mines are putting on more men. This is due to a good demand from the South and Southeast and the fact that the union has become rather badly disorganized, and labor is now obtainable at a wage which enables the producers to enter competitive markets.

Upon reports that a radical element was replacing a conservative one, aiding striking coal miners in Webster County, Major William A. Clarke, Jr., assistant adjutant general, has ordered two National Guard officers to Providence, Ky., for observation duty. Reports of a tense situation have reached Major Clarke, he said.

The Kentucky Washed Coal Co., Nonell, near Drakesboro, operators of probably the largest strip mine in Western Kentucky, will resume operations in a few days, after being shut down for several months, as a result of clay sliding out from under the tippie wrecking that structure, last spring. A new tippie has been erected, and a temporary washing plant, which will be replaced with a highly modern jig plant before long. The plant has a capacity of 35 to 40 cars a day and operates in the Nos. 11 and 12 seams. W. J. Lester, prominent for some years as a strip operator in Illinois and other states, is president of the company. Arrangements have been made for the Harlan Coal Co., Louisville, jobbers, to sell the production of this plant.

Word from Harlan is to the effect that the Black Mountain Coal Corporation, operating one of the largest coal plants in the Harlan Field, after blowing its whistle each morning for a week to call the workers to the mines, and getting no response, has served notice on all of its workers to vacate company houses now occupied, and that legal possession will be taken, it being a case of work or vacate. The men refused a reduction in wages from the 1920 scale, in spite of the fact that



competing companies have generally reduced wages in that section. The company then closed down, and the mines have been idle since April. The new wage scale is being offered.

The new strip mine of the Dawson Daylight Coal Co., near Dawson Springs, which started operations in August, is running from 20 to 30 cars of coal daily and expects to increase that tonnage considerably as changes are made in equipment and arrangements, which will facilitate production. Removal of overburden also will be faster after the first cut is completed.

## MINNESOTA

The Minneapolis Civic and Commerce Association as well as most similar organizations in the Northwest, has issued a statement to the coal-buying public urging that coal be bought early to avoid interfering with the supply of cars for the grain movement.

A petition for receivership of the Reeves Co. has been filed by creditors. E. T. McDonald, Northwestern sales agent for the Philadelphia & Reading Coal & Iron Co., and G. H. Reeves, president of the Reeves Coal & Dock Co., Inc., were named as receivers. The Philadelphia & Reading claimed that the defendant owed \$43,000 with interest since Jan. 31, and \$58,000 due from Sept. 30 to Jan. 31, 1923. The Reeves company, while denying insolvency, did not fight the receivership.

## NEW YORK

Two young men opened an office at Buffalo recently and advertised to sell \$13 coal two hours for \$10. The attempt at fraud was so plain that they were arrested before business had fairly begun. One was discharged and the other was given a short penitentiary term.

## OHIO

There was closed in Cincinnati on Sept. 12 a contract for the delivery of 100,000 tons of Elkhorn coal for seaboard. It is understood that the seaboard prices were such as to make this business more attractive than the lakes or inland. It is said that this is the first large tonnage to move in that direction over the Chesapeake & Ohio for many months.

E. L. Douglass has accepted a position as vice-president of the Briar Hill

Coal Co. in charge of mining operations. He will have his headquarters at Crawford, Tenn. The Briar Hill company is financed by New York interests and owns and has under development some 40,000 acres at Crawford. Mr. Douglass, for many years, had charge of the operating department of the Jewett, Bigelow & Brooks mines in southeastern Kentucky. During the war he was Fuel Distributor for that territory for the government. He also was one of the vice-presidents of the National Coal Association. He was a co-receiver for the J. B. B. Co. when it was placed under the jurisdiction of the court.

## OKLAHOMA

Following a running fight Sunday, Sept. 7, between a motor-car load of attackers and state troops guarding the Kali-Inla mine, near Cambria, where sporadic clashes between union and non-union miners have been reported in recent weeks, additional national guardsmen have been ordered to the district by Adjutant General Baird H. Markham. No one was injured in this latest move against the mine, which is operating on an open-shop basis.

## PENNSYLVANIA

A strike of seven weeks' duration over alleged excess refuse in coal ended last week at the Weston colliery of the T. M. Dodson Coal Co., Hazleton, when 900 men went back.

Morris Lawrence, formerly chief chemist for the Hudson Coal Co. at Scranton, has left the employ of that company and is now engaged in practice in Scranton as a consulting chemical engineer with offices at 301-302 Mears Building. Mr. Lawrence, who is a graduate of Lehigh University in chemical engineering, will specialize on the chemical and research problems of the anthracite industry and in addition will carry on a general consulting chemical engineering practice.

John B. Gallagher, auditor for District No. 1, United Mine Workers, has issued a statement to the officers and members of all locals in the district warning against dual membership in the miners' union and in the organization sponsored by the Workers' party which has headquarters in Pittsburgh. The warning was prompted by reports of radical activities in the anthracite field, Mr. Gallagher said. John L.

Lewis, president of the Miners' International Union, is known to be in sympathy with the warning that has been sent out, having been active in a campaign against these alleged radicals in the miners' union for several years.

The Rochester & Pittsburgh Coal & Iron Co. has begun the shutting down of its stores and other accessories to its Adrian, Eleanora and Helvetia mines, which it announced a few weeks ago were to be abandoned indefinitely if the union miners would not agree to a reduction of wages. The towns and territory generally affected are trying by holding meetings and other means to avert a proceeding that promises to turn a prosperous Pennsylvania industrial district into a poverty-stricken neighborhood. The union refuses to yield and the operators claim that they cannot, if profit is to be expected.

Because of alleged irregularity in suspending a man named Grabosky, who had been serving in the capacity of checkweighman, for a period of two years after charges had been preferred, the charter of Nant-y-Glo local No. 1347, United Mine Workers, has in effect been suspended. Funds of the local have been tied up by order from the district headquarters. President Brophy stated that the charter was not formally suspended but that such action would be taken in the event Grabosky was not reinstated as his suspension was not in accordance with the rules. Mr. Brophy further states that the Nant-y-Glo organization had taken itself out of the union when it failed to pay its district tax. It was for this reason, Mr. Brophy said, that the funds were tied up pending a settlement.

## TENNESSEE

Miners who had been on strike at the mines of the Tennessee Coal, Iron & Railroad Co. at Whitewell for twenty-eight months have been ordered back to work by the local representative of the United Mine Workers. The first break in the long wage contest came when miners at Palmert and Soddy, in this territory, returned to work late in August under a compromise agreement.

## TEXAS

The Texas Power & Light Co., Dallas, is reported to have taken an option on 1,400 acres of land near Trinidad, containing lignite beds, and probably will build an electric power plant to consume the fuel on the ground.

## UTAH

The Columbia Steel Corporation expects to contract, within a few weeks, for the construction of 25 modern dwellings to be erected in its coal town of Columbia.

R. M. Magraw, of Hiawatha, general superintendent for the United States Fuel Co., has been made chairman of the Carbon County Taxpayers' Association. C. H. Stevenson, of Price, a coal retailer, is vice-chairman. The association, similar to many other taxpayers' organizations throughout the



Junior High School and Grade School at Hanna, Wyo.

One of the Union Pacific Co.'s mining towns. Hanna has nothing but mining on which to rely. Like most western coal-mining companies the Union Pacific takes a great pride in its schools. The nature of the soil makes it impossible to clothe the slopes and levels with verdure.



West, studies questions involving tax-exempt securities, limitation of levies and uniform accounting systems for corporations.

The Great Western Coal Mines Co., in which Jack Dempsey, heavyweight boxing champion, did not invest a cent although he was once heralded as owner, is preparing to mine coal in its property on Gordon Creek in Carbon County. It advertises that it will be able to start in October shipping domestic lump at \$4.85 f.o.b. cars at the mine. Stock sales in the company are said to be progressing and development work is advancing. Three miles of railroad grade have been built. Four miles more remain to be done.

Thomas A. Stroup, superintendent of the Clear Creek mines of the Utah Fuel Co., is running for County Commissioner of Carbon County on the Democratic ticket. He has lived in the county eight years. Previously, Mr. Stroup was with one of the big copper mining companies at Bingham, near Salt Lake City.

The drought of Utah, which has interfered somewhat with the water supplies of various mines, has become so severe since the cloudburst of mid-August—the only rain in the state since Memorial Day—that the head of the Mormon Church recommended that special supplication be made in churches on Sunday, Sept. 7, "for Divine assistance that the prevailing drought be broken."

B. W. Dyer, district engineer for the Bureau of Mines at Salt Lake City, went to Pittsburgh, Pa., for the Sept. 8 conference of Bureau field men. He expected to visit the Old Ben Coal Corporation mines in southern Illinois on his return. Much experimental work in rock dusting has been done there.

The Independent Coal & Coke Co., with headquarters in Salt Lake City and mines at Kenilworth, has filed a motion to dismiss the government's action which was to set aside certain land grants to the company on the ground that the land was of known mineral character before the patents were issued. The company holds that more than six years have elapsed since the issuance of the patents and therefore the action is barred by the statute of limitations.

## WASHINGTON

A report compiled by the Bureau of Mines shows that a total of 1,249,878 tons of coal was produced in 1923 from leased public lands of the United States located in various Western States. The ratio of growth of production is shown by the fact that in 1920 but 109,844 tons of coal was produced; in 1921 350,396 tons; in 1922 805,367 tons. The total production for the first quarter of 1924 amounted to 392,542 tons. Leased lands in Wyoming in 1923 yielded 546,519 tons; Utah, 211,300 tons; Colorado, 206,416 tons; Washington, 64,990 tons; New Mexico, 24,486 tons; Montana, 14,991 tons, and South Dakota, 197 tons.

## WEST VIRGINIA

An extra dividend of \$1 a share in addition to the regular quarterly dividend of \$2 a share has been declared on the common stock of the Island Creek Coal Co., payable Oct. 1, to stockholders of record Sept. 19. These dividends make total payments of \$12 a share on the common stock for the current year, as extra dividends of \$1 a share were paid in the previous quarters. The regular quarterly dividend of \$1.50 a share also was declared on the preferred stock payable Oct. 1, to stockholders of record Sept. 19.

A table prepared by the West Virginia Department of Mines shows that in coal produced in West Virginia in the fiscal year ending June 30, 1923, the Fairmount region led all others with a total output of 17,064,070 tons, the Pocahontas field ranking second with 16,724,010 tons. The table follows:

District	1923	1922
Panhandle.....	5,016,599	3,796,904
Fairmount.....	17,064,070	9,625,112
Preston-Barbour.....	6,694,430	3,066,657
Elk Garden.....	1,999,701	1,080,042
Mason.....	80,203	48,253
Putnam.....	365,047	170,552
Kanawha.....	9,812,000	6,110,150
New River.....	14,099,298	11,900,162
Logan.....	10,984,839	13,904,980
Pocahontas.....	16,724,010	18,354,975
Mingo.....	3,101,211	2,130,416
Small Mines.....	1,000,000	700,000
Totals.....	87,031,408	70,888,203

Having given notice to its employees that on Sept. 2 operations would be resumed at Osage Mines Nos. 1 and 2, on Scott's Run, Monongalia County, on the 1917 wage scale and employees having failed to report for work on that date, the Brady-Warner Coal Corporation has issued eviction notices which became effective on Sept. 11, according to the notice. There are 67 houses at the two Osage plants, 65 of them being occupied by union miners who have refused to accept the reduction in wages proposed by the company.

At the sale of the Gaymont mine, in Fayette County, the highest bid was \$600, notwithstanding the fact that the sale covered a leasehold of 1,000 acres of unworked coal at a 10c. royalty, a fully equipped, going mine, turning out a superior product. The Circuit Court of Fayette County at last accounts had not confirmed the sale. A further effort is being made by the special commissioner to find a buyer.

Progress is being made by the Pocahontas Fuel Co. in installing two large plants on its 30,000-acre lease, obtained from the Frick coal interests in Tazewell County, Va., and McDowell County, W. Va., on Jacobs Fork and Dry Fork, respectively. The cutting, cleaning and loading of coal is to be done by machinery.

The Hatfield Reliance Coal Co., of Cincinnati, proposes to build two piers equipped with coal-loading equipment at Huntington, according to plans on file in the office of the U. S. Engineers at Huntington. The company has for a number of years been shipping coal from its Kanawha mines by barge down the Kanawha River through Pt. Pleasant and from that point to Cincinnati

by the Ohio River. By building piers at Huntington and shipping by rail from the Kanawha field to Huntington—a much shorter distance than by water to Huntington—it will be possible to eliminate the long barge haul, using the river only from Huntington to Cincinnati. There is said to be no connection between the proposed construction of piers by the Hatfield Reliance Company and the Logan Coal & Dock Co., in which Philadelphia people are interested. The Philadelphia capitalists will ship their coal from the Guyan field to Huntington for transshipment to Cincinnati and other down-river markets.

## CANADA

John G. Quinn, mine manager at No. 5 and 6 mines at Comox, Canadian Collieries (D), Ltd., has resigned and will leave for New Zealand to take over the management of a colliery there.

The City Council of St. John, N. B., has had under consideration the dredging of the slip on the west side of St. John harbor occupied by the Colwell Coal Co. for some years. The facilities in the slip will be greatly improved for the handling of coal.

There is no indication of a settlement of the Crow's Nest and Alberta coal strike and a report is being circulated, which is without confirmation, that the Coal Creek Collieries are to be closed permanently and that an effort is to be made to open the Michel Mine regardless of the attitude of the United Mine Workers.

The coal trade has not been as brisk in the Vancouver Island field recently as it was in the month of July. With the exception of the Granby Colliery, Cassidy, and the Nanoose-Wellington Collieries, Lantzville, none of the island mines worked full time during August. There have been no signs of the improvement looked for as winter approaches.

Relieving in a certain measure the coal famine which threatens Alberta as a result of the deadlock between striking miners of District No. 18 and the operators, two mines in the Drumheller Valley are expected to resume operations immediately. It is understood that these Alberta mines have arrived at individual agreements. The mines in the carbon fields, many of which have not yet come within the scope of the United Mine Workers, are now producing more coal than they have for years.

The charter of the Westville local of the United Mine Workers, one of the strongest in Nova Scotia, has been withdrawn by the district executive, La Herly. This local has been entirely dominated by the radical element with Dan Livingston, deposed president of the district, and Alexander R. Stewart, deposed member of the International Board, controlling the situation. They have refused to pay their dues to the district or international organizations. Drastic action was advised by John L. Lewis, president of the International Union.



## Traffic

### Indiana Rate Discrepancies Being Adjusted

A supplementary tariff correcting increases on coal freight rates where reductions should have been made and granting the intrastate rates for shipments between two Indiana points when the route goes outside the state, is being prepared by the coal-carrying railroads of the state, according to George H. Mosser, managing director of the Indiana State Chamber of Commerce. Mosser said the coal rates in the schedule, which became effective Aug. 1 under an order of the Public Service Commission, bore many reductions, but had also increases between points not specified in the order issued by the commission. These discrepancies are being corrected.

## Recent Patents

**Mining Machine;** 1,489,583. Edmund C. Morgan, Chicago, Ill.; Olive E. Morgan executrix of Edmund C. Morgan, deceased. April 8, 1924. Filed Sept. 5, 1914; serial No. 860,369.

**Process for Carbonizing Coal;** 1,490,354. George W. Wallace, East St. Louis, Ill., and Arthur W. Warner, Media, Pa., assignors to the Wallace Coke, Oil & By-Products Co., East St. Louis, Mo. April 15, 1924. Filed Dec. 21, 1921; serial No. 523,910.

**Mining Apparatus;** 1,490,398. Edmund C. Morgan, New York, N. Y., Olive Morgan executrix of Edmund C. Morgan, deceased. April 15, 1924. Filed Jan. 14, 1916; serial No. 72,044. Renewed Oct. 7, 1920; serial No. 415,276.

## Trade Literature

**Putting the Right Steel on the Job.** Taylor-Wharton Iron & Steel Co., High Bridge, N. J. Pp. 22; 5x8 in.; illustrated. Describes the many uses for Tisco steel.

**Thor Electric Drills.** Independent Pneumatic Tool Co., Chicago, Ill. Catalog No. 14. Pp. 25; 7½x10½ in.; illustrated. Electric drills and grinders, electric screwdrivers and electric drill stands are described.

**Centrifugal Pumps.** Morris Machine Works, Baldwinville, N. Y. Bulletin 122. Pp. 19; 8x10 in.; illustrated. Describes the construction and operating details of the Morris double-suction centrifugal pumps with horizontally split casing.

**The Celie Products Co.,** Chicago, Ill., recently published the following bulletins: **The Insulation of Boilers,** bulletin B-6e, describing in detail the method of insulating employed for various types and sizes of boilers; **The Insulation of Industrial Furnaces and Ovens,** bulletin B-8d.

**American Blower Co.,** Detroit, Mich., has issued Bulletin No. 1613 and Bulletin No. 1002, the former describing the **Ventura disc fans** and the latter the **Sirocco fans.** These bulletins are four-page folders and illustrated.

**Origin, Development, Results of Elesco** is the subject of a booklet published by The Superheater Co., of New York and Chicago. It gives a brief history of that company. Pp. 15; 3½x8½; illustrated.

**The Blacker Engineering Co.,** Grand Central Terminal, N. Y., has just published a new catalog describing the various types of blacksmith hammers manufactured by this concern.

**The Osgood Co.,** Marion, Ohio, has just issued a new circular, No. 245, featuring the application of traction wheels to railroad-type steam shovels. This new circular describes the various types of railroad and standard shovel equipment used in stripping operations and colliery yards.

Bulletin No. 390, describing roller bearings for mine cars, has just been published by the **Hyatt Roller Bearing Co.,** Newark, N. J. This book describes in detail the various types of bearings made by this

company applicable to coal mine cars. It also points out the advantages of roller bearings to increase transportation speed, reduce maintenance and upkeep charges and also effect power savings.

**The Oxweld Acetylene Co.,** Long Island City, N. Y., has just published a new 48-page catalog illustrating and describing in detail its extensive line of acetylene generators and oxyacetylene welding, cutting, lead-burning, heating and decarbonizing equipment. The book is full of information for the user, or prospective user, of oxyacetylene apparatus.

## New Companies

**The Tri-State Coal Co.** has been incorporated in Miami, Okla., with a capital of \$10,000, by Hobart L. Cheyne, W. B. Larimore and J. J. Stratton.

**The Rogers Elkhorn Coal Co.** has been incorporated in Virgie, Ky., with a capital stock of \$50,000, by T. T. Rogers and T. E. Rogers, of Virgie, and T. G. Rogers, of Greenville, Ky.

**The Jennie Wilson Coal Co.** has been organized in Owensboro, Ky., with headquarters at 326 W. 7th Street, Owensboro, with Jennie Wilson, president, and George S. Wilson, secretary. The company has 600 acres of coal land under development.

**The Sixty-Eight Mining Co.** has been chartered with a capital of 750 shares, no par value designated, to operate at Jacksonville, in the Hocking Valley district of Ohio. The property was obtained from the Central West Coal & Lumber Co. The incorporators are A. R. Jones, D. H. Armstrong, Elizabeth Voil, D. F. Shafer and F. E. Roth. Extensive improvements will be made to the property.

## Obituary

**William Scott Thomas,** well known in the coal industry in Schuylkill County, Pennsylvania, died in Philadelphia, Aug. 28, in his 79th year. He was born in Nova Scotia, removed to Schuylkill County when quite young and entered the employ of the Philadelphia & Reading Coal & Iron Co., becoming superintendent of the Mahanoy division. Subsequently he was engaged in the coal business under the name of Bright, Thomas & Co., the firm being known later as Donaldson & Thomas. He retired from active business in 1919.

## Coming Meetings

**West Virginia Coal Association.** White Sulphur Springs, Sept. 19. Secretary, W. H. Cunningham, Huntington, W. Va.

**National Safety Council.** Thirteenth annual safety congress Sept. 29 to Oct. 3. Louisville, Ky. Managing director and secretary, W. H. Cameron, 168 No. Michigan Ave., Chicago, Ill.

**Alabama Mining Institute.** Annual meeting, Oct. 7, Hotel Hillman, Birmingham, Ala. Secretary, James L. Davidson, American Trust & Savings Bank Bldg., Birmingham, Ala.

**Illinois Coal Operators' Association.** Annual meeting, Oct. 7, Chicago, Ill. Secretary, C. E. McLaughlin, Fisher Bldg., Chicago, Ill.

**American Institute of Mining and Metallurgical Engineers.** Fall meeting, Birmingham, Ala., Oct. 13-15. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

**American Institute of Electrical Engineers.** Fall convention, Pasadena, Calif., Oct. 13-17. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

**American Gas Association.** Sixth annual convention and exhibition, Steel Pier, Atlantic City, N. J., Oct. 13-17. Secretary, Alexander Forward, 342 Madison Ave., New York City.

**Canadian Institute of Mining and Metallurgy.** Sixth annual Western Meeting, Oct. 16-18, Blairmore, Alta., Can. Secretary, Moses Johnson, Blairmore, Alta., Can.

**Third National Exposition of Power and Mechanical Engineering.** Dec. 1-6, Grand Central Palace, New York City.

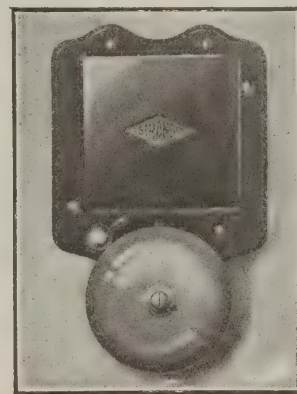
**Coal Mining Institute of America.** Annual meeting, Dec. 3-5, Chamber of Commerce Bldg., Pittsburgh, Pa. Secretary, H. D. Mason, Jr., 909 Chamber of Commerce Bldg., Pittsburgh, Pa.

## New Equipment

### Bell with No Contacts

A transformer-type bell which has no contacts to cause sparking has been developed by W. R. Ostrander & Co., 371 Broadway, New York.

The bell requires only one watt to operate it and is therefore called a one-watt efficiency bell. It consists of a special laminated core and insulated coils mounted directly on a terminal board of bakelite. The armature has



Safe Bell for Mines

Because this little unit has no arcing contacts it is especially suitable for mine service. Neither moisture nor gas can make it dangerous.

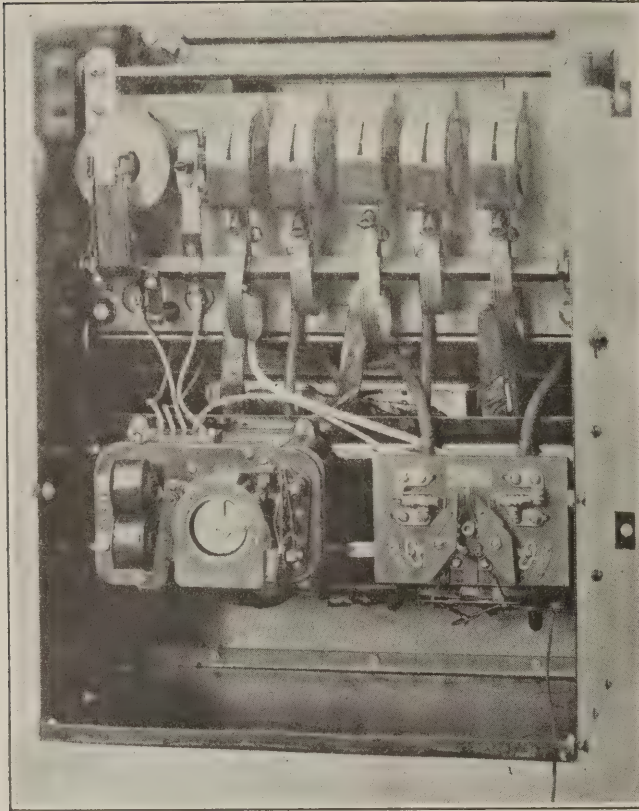
no arcing contacts, and consequently the bell is safe for use in mines or other places containing explosive gases. When the armature operates it vibrates at a natural frequency of about 60 cycles and is adjustable. A cast-brass gong is mounted on the bottom of a frame which supports the transformer element. The standard rating of the bell is 12 volts.

### Starting Compensator Has a Time-Temperature Relay

A new automatic starting compensator for squirrel-cage induction motors will soon be placed on the market. This motor starter is for remote control of constant speed two- or three-phase squirrel-cage motors up to 600 volts for general applications such as driving line shafting, pumps, compressors, blowers, conveyors, etc. With it such equipments may be started or stopped from a distant point by means of one or more small hand-operated push buttons or snap switches located within convenient reach of the operator or automatically operated by a pressure governor, float switch, or thermostat.

The General Electric Co., which manufactures this compensator, has incorporated various new features. Definite and adjustable time acceleration is obtained by means of a new induction-type relay. Positive overload protection of the complete equipment is provided by a double-pole,





### Inclosed Motor Starter

Remote control apparatus makes it easy and safe to start any motor connected to this new compensator. A temperature relay combined with other protective devices prevents damage to the motor. In coal tipples and breakers push buttons may be placed at various points so that the motor may be quickly stopped in case of an emergency. It is always desirable that the operator be in a position where he can see the driven equipment before and during the acceleration period of the motor.

inverse time temperature overload relay. The starting and running magnetic contactors are mounted back-to-back in a sheet-steel inclosing case providing easy access to all parts. Several taps on the auto-transformer provide for adjusting the low voltage

to suit the starting requirements of different motor loads.

All parts are protected by the steel inclosing case and a conduit box at the back has several knock-outs and furnishes entrance for all power and control wires to the starter.

### Dampproofing Material for Concrete Surfaces

The Truscon Laboratories, Detroit, Mich., announce the placing on the market of a new product, known as Super Por-Seal. This material is a transparent dampproofing, intended for application over concrete, stucco, brick and masonry.

Most materials in this class in the past have been made of waxes, petroleum or other mineral-oil substances. The result is that even in the best of them, there was a slight tendency to stain the surface, due to oily nature of the compounds.

#### SEALS ALL MINUTE PORES

Super Por-Seal is a water-repellent compound for dampproofing. Its general composition is much the same as waterproofing paste, except that it is in a clear solution. It is absorbed into the pores of the stucco or masonry, where on evaporation of its volatile solvent it lines these pores with a highly water-repellent compound. Water thrown on such a surface runs off as freely as it would from a duck's back. Some interesting tests have been made of stucco surfaces, treated with only one coat of the material and stucco surfaces without any dampproofing. A bucket of water thrown on the untreated stucco surface immediately darkens the wall indicating water absorption. Water thrown on the treated

surface shows no darkening because it runs off immediately.

Such a material naturally is an excellent protective coating against moisture and frost for stucco, concrete, brick and stone. It doesn't darken or discolor the surface at all.

### Electric Drill Will Work in Concrete and Soft Stone

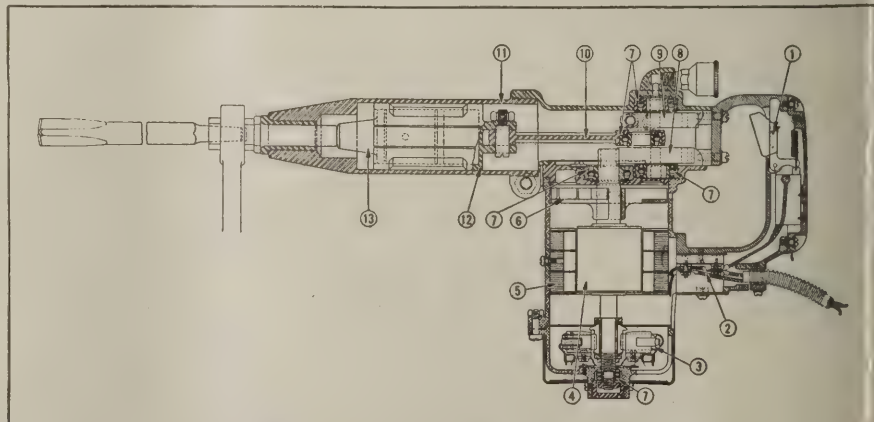
An electric hammer drill, suitable for drilling concrete and soft stone as well as for light chipping of metals, has

recently been developed by the Chicago Pneumatic Tool Co. It is equipped with a universal motor and will operate interchangeably on direct or alternating current. It is necessary merely to have the motor wound for the correct line voltage on which it is to operate.

The hammer blow delivered on the drill steel or chisel is the result of energy stored up by a rapidly moving piston which is mechanically free from the impelling force. The connection between the piston and the driving mechanism is by means of air which, at the instant the blow is delivered, restores energy to the piston through the expansion of the air which formed a cushion at the end of the upstroke. This means that there is no tendency for the electric wires or connections to be crystallized due to incessant jarring.

The essential details of the hammer are as follows: 1. Conveniently located inside trigger pistol grip switch of quick-acting type, so constructed to prevent starting of drill only by operator. 2. Terminal block for cable permitting cable replacement without disturbing other connections. 3. Adjustable brush rigging permitting of shifting brushes for perfect commutation. 4. Armature, drum wound. Heavily insulated coils carried in insulated slots in armature core. 5. Laminated stator structure having distributed pole-face windings. 6. Sheet-steel fan, carefully balanced and reinforced, providing thorough ventilation of motor. 7. Armature and all revolving parts mounted on high-grade ball bearings. 8. Crank gear. 9. Crank counterweight. 10. Connecting-rod. 11. Barrel. 12. Cylinder. 13. Piston.

The tool is well-balanced and when held loosely in the hand has the line of its center of gravity within the barrel of the tool and the operator's hand, thus causing the tool to hang vertically. A convenient trigger switch is located in the handle for the control of the electric current. The release of this switch opens the circuit, and the switch being inside the handle, the motor cannot be started accidentally by a blow from the outside. The bearings are all of the ball type, provision being made for lubrication of all revolving and reciprocating parts. All moving parts, including the gears, which are subject to wear, are hardened.



### Pneumatic-Electric Hammer Drill

Due to the serious vibrations set up in all types of hammers electrically operated, units must be carefully designed. This little drill delivers energy through the medium of air. The tool is well-balanced and may be started or stopped easily by means of a trigger switch.



# COAL AGE

McGraw-Hill Company, Inc.  
James H. McGraw, President  
E. J. Mehren, Vice-President

Devoted to the Operating, Technical and Business  
Problems of the Coal-Mining Industry

R. Dawson Hall  
Engineering Editor

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Number 13

## Long Way to Bottom Of World's Coal Bin

TO THE average person, that is, to the vast majority of those who make up what is usually termed the general public, two questions concerning coal are always pertinent. The first of these has to do with price—price now, next month, next year. The other is a vague uncertain apprehension, fostered more or less by writers of popular and semi-scientific fiction, that the world is burning up its supply of coal faster than it should and that within a comparatively short time, say a generation or two, the fuel bounty wherewith nature has so lavishly endowed this land of ours will have been exhausted and the peoples of that day and age will be compelled to seek some substitute means of heat supply or go cold and perhaps hungry as well.

As to the future trend of prices so many variables enter the equation that any attempt to forecast it can be little more than mere speculation. Certain it is that the extent to which labor-saving machinery is or can be adopted will play an important rôle in price determination.

Exhaustion of our coal resources is a possibility that is extremely remote. The period of time during which the world's known coal supply will be adequate to its requirements has been variously estimated by "experts" at from 500 to 15,000 years. This old planet, therefore, will not go cold for lack of fuel during the lives of men now living, nor within those of their children or their children's children. During 110 years of commercial coal production in the United States this country has exhausted, including losses incurred in mining, appreciably less than 2 per cent of its known coal deposits. Making all due allowance, therefore, for the increased demands of the future it is certain that our coal supply will last for "quite a spell."

## Yet There Are Compensations

WE SYMPATHIZE in the United States with our government-behounded British coal-mine operator cousin and we trust that our federal authorities will never so harass us to the disadvantage of the consumer, operator and miner alike. But there is a compensation. The British Government likes to see coal prices high because it means automatically much higher wages to the miners. It helps greatly with two million or so coal-miner votes. The women vote, of course, and their interest is the same as that of their men.

It is good indeed to have the government interested in high prices in your industry. The British Government chuckles when the operator gets a good price just as ours does when the farmer gets an increased return for wheat and corn. It must seem good to have the government with you when you boost your price and

look sad when you lower it. It's not so here unless you are a farmer. They coddle the farmer vote here just as they do the miner vote in Great Britain.

But then, and here's the rub, when the operator increases the "f.o.b. pit," the retailer raises his prices, which is, of course, to be deprecated. The government hounds the retailers for this offense. However, that attempt to shift the blame would not work if the consumer was properly organized like the miner. The government would take the snivelling retailer in hand just as Charlie Bryan did. It would establish coal depots on free non-taxpaying ground in the heart of the city. But the consumer really doesn't matter so much in Great Britain. He is poorly organized. He votes on large national issues.

The miner alone counts. He votes for himself, for his own wages and lets politics go at that. So the government is glad when coal prices rise, especially as about one hundred millions of tons, or over 33 per cent of the whole output, go abroad, and only one-third of the whole production is used for domestic purposes. When the foreigner pays who should care? He has no vote whatever and so is beyond the pale altogether and has no rights that anyone respects. No nation is really internationally minded.

## Union Mines Are Safe

IN THIS month's issue of the *United Mine Workers' Journal* is a cartoon entitled "He Changed His Tune," which is flavored, to say no more, with truth. A man is seen approaching a non-union mine, with a pick in hand, saying: "This is the life! The United Mine Workers can't tell me what to do." In the next picture, the man's pick is flying from the drift mouth in a manner suggesting an extremely violent explosion, and in the third the man, who is greatly frightened, is running from the mine pursued by a dog marked, "Accidents due to poor working conditions." By the way, the miner has had time meanwhile to put adhesive plaster on his face.

The flavor of truth in the story is that the union mines which do not work cannot well have accidents and therefore are safe. On the whole the working conditions are better in non-union than in union mines, some having wonderful records and many leading in protective devices, but the union mines are winning just now in the competition for safety, though not so much as the United Mine Workers would have us think. There are no accidents in industry when there is no industry to have accidents. The tin-mining industry in the United States has less accidents than that in Great Britain because in the former no one is employed in that industry. However, the automobiles at union mines are doing what mine accidents cannot do. When the mines are idle, there are more fatalities on the surface.



## What Foreign Trade Demands

**F**OREIGN commerce can be built up only on service. It is not possible to succeed if foreign trade is accorded less consideration than domestic. In fact, it is necessary to treat it with more care. The foreigner knows next to nothing about American coals, and Americans, knowing little about foreign boilers and firemen, cannot afford to dismiss the problem of distribution as cavalierly as they sometimes successfully do in this country. They must follow their fuel to the boiler room; they must note its behavior; they must ascertain what kind of coal will do the work best.

In this country a manufacturer who has had success with the low-volatile coal of one producer can find where there is another mine owner producing similar fuel. He can go to his dealer; he can ask his neighbors; he can consult a directory; he can look up the town on the map and seek another producer operating nearby or he can look in a trade paper and get some information—no matter how meager—from the advertisements it contains. Then there are the publications of the Bureau of Mines. His chances are one hundred times as good as those of a foreign buyer who, after much diligent but ill-directed inquiry, may get a gas coal in place of a low-volatile or vice versa. Success in coal selling abroad is based on service and mutual confidence.

Another necessity is a yard. Foreign buyers are often small consumers of coal. Besides, they, like others, do not like to buy a large shipment until they have tried out the coal. If foreign trade is to be built up the shipper must be prepared to deliver in almost any quantity. It is well to be able to give the buyer a chance to see the coal. It is partly because this element of success in selling has not been observed that so far we have been unsuccessful in placing coal in large quantities in Europe.

## Why Hunt Trouble?

**W**HEN buying new equipment why not make use of the expert knowledge of the manufacturer and at the same time automatically arrange the transaction so that the machinery being purchased is guaranteed to do the work required?

Too often the mining company having an elaborate engineering organization goes to unnecessary expense in preparing detailed specifications covering new equipment. Limiting dimensions and other essential details should of course be prepared with all possible care. However, most specifications should stop here, inviting the manufacturers to submit proposals covering a machine which will accomplish the desired result under the conditions set forth. Ordinarily the reliable manufacturer is only too glad to sell machinery on such a contract, accepting full responsibility for satisfactory performance.

Many times it has happened that a purchaser, who went to considerable trouble and expense in calculating and preparing elaborate specifications, found after installation that the new equipment was inadequate for the service intended. The manufacturer proves that he is not at fault because the machine conforms to the specifications which described the equipment but did not state the work to be performed. This sort of situation is about as unpleasant for the manufacturer

as it is for the purchaser. In most cases the maker, due to his knowledge and experience in his special line, could have furnished a satisfactory machine had he been given the proper latitude in the specifications.

When purchasing new equipment don't hunt for trouble. Include the necessary detail, putting it up to the manufacturer to supply a machine which will accomplish a definite purpose. On the other hand, avoid ordering duplications of old equipment that the manufacturer has discarded. This practice is neither fair to the makers of machinery nor to the purchaser. It cannot yield the best results. Spare parts cannot be as cheap if specially made and the company which gives an exact repeat order often finds its repair parts are more expensive and the efficiency of its equipment lower, though it gains, of course, in the quantity of spare parts carried, in not having in some cases to buy spare parts and also in the fact that its men know how to handle the old equipment and it would take time to accustom them to the new. The gains, however, are far less than the losses. In the interest of morale, no company should be buying new machinery of old type.

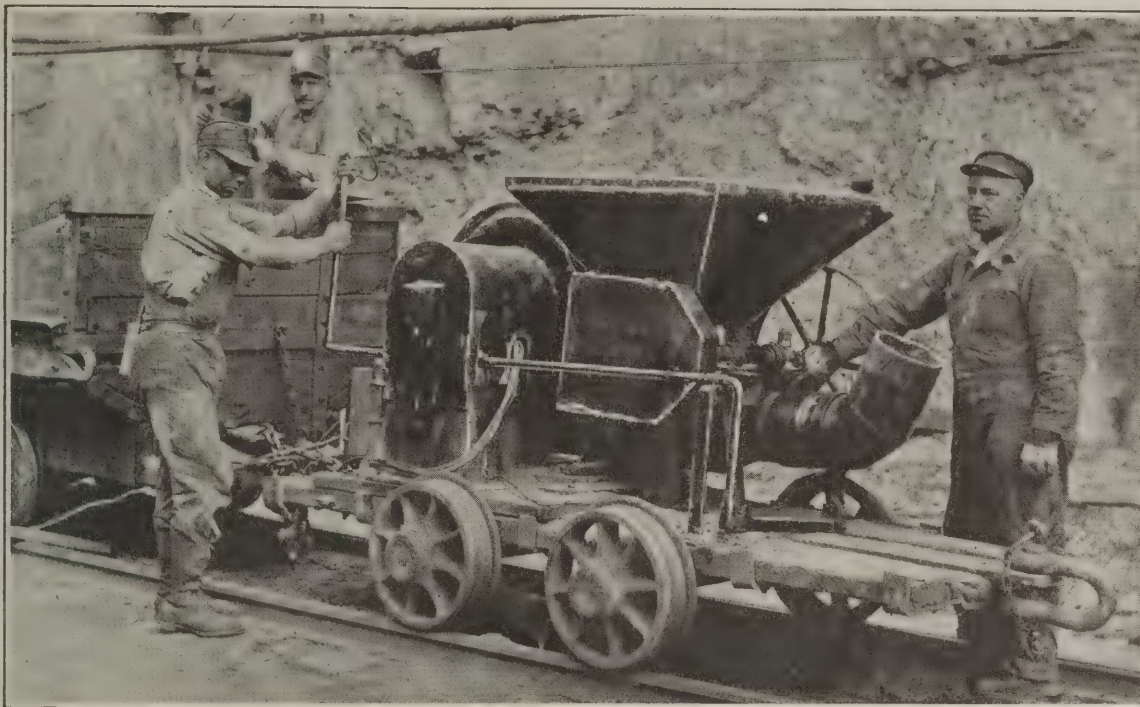
## "Keep Cool with"—Coal

**W**E HAVE only a few ways of keeping cool—all quite costly. One is to go out of town to the hills, the woods, the sea or the strand. Another is to take an automobile ride or a short excursion on the trolley. As George H. Cushing, speaking mainly of the moderately well-to-do, has well said, "it costs \$350 a month to keep cool; it costs about \$30 a month to keep warm." That is because we don't go about the business of keeping cool in the same way. We make our houses and offices warm; we do not make them cool. Who would not be happy to pay as little for reasonable coolness as for satisfactory heat? Too often we miss our calculation and go away in a cool spell to shiver and return to face blistering heat. But if we cooled our houses and offices we would make no mistakes of this kind; we would use our cooling apparatus when we needed it, even in the spring or autumn if the conditions warranted it.

The summer holidays are growing longer and "week-ends" are getting more numerous and time consuming. True, vacationing has its value. It clears the tired brain of cobwebs; it widens the scope of one's interest; it gives the children a relaxation they need; it affords an opportunity to cast off civilization just a little and go back to nature, but still it is getting to be a drain on business activity and, moreover, some cannot go, and in the still heat of city streets how greatly vitality is drained from those who have to stay at their desks!

In winter we have sometimes to raise the temperature of the air coming into our houses 60 to 90 deg. and in summer all we would need to lower the temperature would be 10 to 20 deg. The lowering may be inefficient as compared with the raising of temperature, but the range being so much less, the cost should not be excessive. This dissertation seems little germane to the subject of this publication, coal production, but the use of power to produce cold would level the peaks of coal consumption and the coal industry might do well to advocate the practice of the artificial cooling of houses, offices and places of public resort.





Kenilworth Rock Duster

## Rockies Are Full of Ingenious Dusting Machines

Lacking Perfected Apparatus, Mines Are "Rolling Their Own," Using Whatever Equipment Is at Hand—Uniform Feed Difficult to Assure—At Kenilworth, Hillside Dirt Is Blown on Freshly Watered Surfaces

**I**NGENUITY is having a full opportunity to do its work in the Rocky Mountain coal mines these days. The great problem "How to rock dust?" faces every mine superintendent, and it is no simple problem. But every man wants his mine made safe against the ignition of coal dust even if he is not driven to do it by law as in Utah. As a result the mountain region is full of home-made devices for applying inert dust of one kind or another and employing various principles. At Wattis, Utah, they are "mudizing" as described in a recent article. But most mines are blowing the dust in dry, using either adobe or native soil, ground or unground, or they are pulverizing shale or soft sandstone. One company tries soaking the entries first.

Nobody knows all about the art of rendering coal dust in a mine incombustible, but the men of the Rockies are finding out a great deal by the cut-and-try method, based on all the information available. Their greatest difficulty, just now, is to produce a dusting machine capable of applying the material as they think it ought to be applied. To meet this shortcoming they are inventing and adapting—and getting things done.

At Kenilworth, Utah, for instance, the men of the

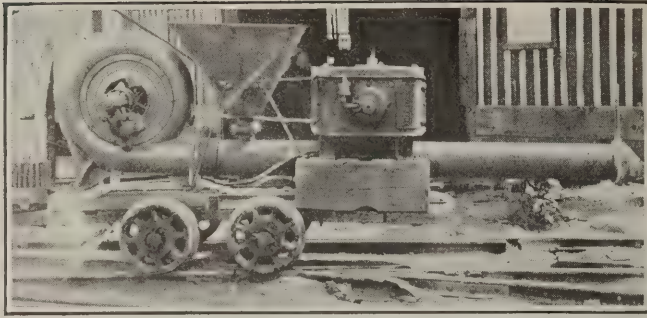
Independent Coal & Coke Co. have built a unique machine and adopted a method all their own. Around Kenilworth, as at many other mines in the Utah Wasatches, there are thick outcrops of rock deposits which lend themselves well to rock dusting. The material is a sort of sandstone which disintegrates rapidly and completely under exposure to the weather. This dirt can be shoveled easily from the face of a bank through a sand screen and into a mine car and delivered into the mine as rather finely pulverized rock dust.

There is difficulty in stating exactly how fine it is, but judging it by its appearance and texture, a considerable portion would pass through a 200-mesh screen as most of it is finer than motor sand and crushes easily to talcum-powder fineness between the thumb and the forefinger. Recognizing this as a handy supply of rock dust, W. H. Woodhead, master mechanic; K. F. Lueder, mine foreman, and others of the mine force set to work building a machine under the direction of Superintendent W. F. Clark that would apply it.

They built a 1-yd. capacity bin of  $\frac{3}{8}$ -in. sheet steel welded at the joints in the form of an inverted pyramid. An ample outlet at the bottom of this bin feeds the dust down into a 12-in. pipe carrying the air discharge of a blower, an ingenious combination agitator and feeder preventing the dust from caking and delivering it to the outlet. The pipe is tapered so that the discharge is of only 8 in. diameter. Here a loose elbow may be revolved through an arc of about 45 deg.

NOTE—The rock-dust distributor in the headpiece was built for use in the Kenilworth, Utah, mines of the Independent Coal & Coke Co. mainly through the ingenuity of such men as Master Mechanic W. H. Woodhead (right), and Mine Foreman K. F. Lueder (left). It requires three men to operate it, including a motorman whose locomotive pushes the duster and its accompanying car of dust. The operator of the machine turns the discharge pipe about with the lever at the rear end of the car, as illustrated by Mr. Lueder, and the third man must shovel dust from the pit car into the hopper (posed by Fireboss Sam Westerfield).





**This Is an Example of New Mexican Ingenuity**

The new machine for blowing dry dust into manways, return aircourses and back entries in the Stag Canyon mines of the Phelps-Dodge Corporation at Dawson, New Mexico, consists of a 40-in. blower driven by an ordinary mining-machine motor. Dust is fed by gravity from a sheet-steel hopper into the discharge line which terminates in an elbow that has been cut in two to give the dust stream only a slightly upward direction. This unit is attached to a mine car carrying the dust supply, and the whole outfit is moved by a locomotive.

Of course, the men realized that the flow of dust from the hopper into the air stream must be uniform. It would not do to have the outlet at the bottom of the hopper so small as to cause packing or arching. Neither would it do to have the outlet so free that the dust flow would be too heavy for the air. And provision had to be made to prevent blowing back through the bin.

So along in the late summer they rigged up their feeding device, which was designed to overcome these difficulties and yet be simple and rugged. A section of 5-in. pipe suspended on an axle was set horizontally through the outlet aperture at the bottom of the hopper. Eight strips of  $\frac{1}{4}$ -in. flat steel  $1\frac{1}{2}$  in. wide were welded on edge to the outer surface of the pipe in parallel arrangement. This converted the pipe into a sort of paddle wheel, with the steel blades revolving through an arc which extended upward about 2 in. into the dust bin. The remainder of this combination agitator and feeder was enclosed in a cylindrical housing open at the bottom.

The dust fed by gravity into the spaces between blades, was revolved downward and dropped into the air pipe whence it was blown out through the elbow nozzle. The steel blades successfully prevented the dust in the bin from arching over the outlet. The housing in which the feeder revolved was of sufficiently snug fit to prevent much back pressure of air should the exhaust pipe be partially choked. The device provided also a uniformity of dust feed.

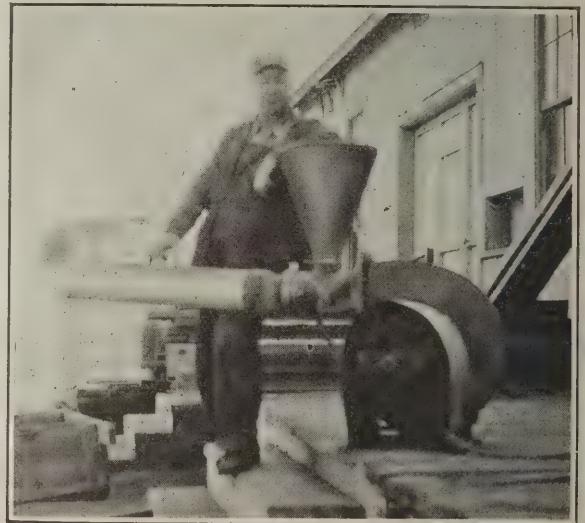


**Rock-Dust Barrier at Dawson, New Mexico**

This method of suspending V-troughs from crossbars is considered, by the Phelps-Dodge Corporation, as the best way to support barriers in the No. 6 mine of the Stag Canyon group. The roof is brushed high enough to erect 16-trough batteries, leaving a full 6 ft. of headroom. A battery covers the full width of the entry. Sixteen troughs when heaped have a capacity of 49.6 cu.ft. The dust used is tailings from a concentrator in the region. The roof and ribs are covered with wet adobe dust by a cement gun, even in the spots occupied by the barriers.

The upturned elbow at the discharge end of the pipe would revolve because the threaded joint was not screwed up tight. The dust stream could be directed from rib to rib at the will of an operator at the opposite end of the machine. An upright lever mounted close at his hand was connected with a rod running the full length of the machine and supported solidly on strap-iron rests equipped with plain bearings. Opposite the discharge end of the pipe this rod was bent downward in a right angle and connected, through an 18-in. steel link, to an arm projecting from a collar clamped firmly around the discharge elbow. By this lever and its connections, the elbow nozzle could be turned.

A 5-hp., direct-current motor, operating at 1,750 r.p.m., direct-connected to the 24-in. blower was also used to revolve the feeding device in the hopper. To do this, a 4-in. pulley was mounted on an extension of the fan shaft. A belt from this pulley to a 24-in.



**One of the Original Union Pacific Dusters**

This direct-connected blower in inverted position supplied the air and the small conical hopper supplied the dust which was discharged through the flexible-jointed pipe shown here in the hands of Supt. T. H. Butler of the Hanna, Wyo., mine of the company. The outfit was mounted on a mine-car track.

wheel accomplished one speed reduction. Further reduction was made by an 18-tooth pinion on the belt wheel shaft meshing with a 78-tooth gear on the shaft of the feeding device. Thus a speed of 67 r.p.m. was imparted to the feeder. All the gears and the motor were housed in sheet iron for safety.

About 100 ft. of light cable was used to connect the motor to a source of power. This cable was "hot-hooked" on the trolley wire as the outfit moved slowly along, or the end of the cable was clipped to the trolley wire and the clip moved from time to time as the machine advanced. The motor was grounded on the track through a truck axle.

When the machine first went into the mine it discharged the finely divided sandstone successfully, but not enough of it stuck to roof and ribs. The plan was then adopted of preceding the machine with a sprinkler hose. The entry in the process of dusting was thoroughly washed down immediately ahead of the machine, and the rock dust was sprayed onto surfaces saturated with water. The result was reasonably satisfactory. The sprinkler washed the coal dust to the floor, and the rock dust stuck to the surfaces in a sort of plaster coat. This "plaster" tended to let go its coarser particles





**A Booster Fan Does the Work Here**

This simple machine, which consists merely of a twelve-inch booster fan and a small wooden dust hopper from which dust is expected to slide by gravity through a curved pipe into the air stream, represents one stage of experimentation with the dusting problems at the Bon Carbo mine of the American Smelting & Refining Co., near Cokedale, Colo. Charles Smith, mine electrician, appears in the picture.

and presented, when fully dry, a rather dusty surface.

The machine distributed about two tons of dirt in completely dusting 1,000 ft. of 24-ft. entry which had an unusually high roof. The height sometimes ran up to 18 ft. The machine and an attached mine car of dust were handled by the hoisting rope on slopes and by a locomotive on main entries.

The machine was put into operation in August of the present year. There were distinct limiting features to this machine in its early stages, but some of these can be removed. The main difficulty was that it required too many men. When it was hauled by a locomotive a crew of four were required. One man sprinkled ahead, a motorman handled the locomotive, a shovelman stood in the mine car feeding dust steadily into the hopper and the machine operator directed the dust, started and stopped the fan and looked after the power cable.

When the outfit hooked onto a haulage cable on a slope, of course no motorman was necessary, but the hoistman should be accounted as part of the crew, for haulage on the rope was obviously impossible while the dusting was in progress. The shovelman could be eliminated only by increasing the size of the dust hopper, which would probably necessitate changing the feeding mechanism. But whatever its limitations, the machine represented one more idea in the long list which the West is developing. From experimentation with such ideas comes the finished machine of the future.

Another home-made dust distributor with many of the same limitations was that which was built in August at the Bon Carbo mine of the American Smelting & Refining Co., near Cokedale, Colo. It consisted of a wooden bin to hold about  $\frac{1}{2}$  yd. of dust. The feed was by gravity assisted by suction from the air line. The opening in the bottom of the bin was equipped with a pipe in the air line turned in the direction of the air travel. The necessary blast of air was supplied by a 12-in. booster fan blowing through a pipe which tapered to a diameter of about 3 in. at the outlet. This simple and compact outfit was mounted on a mine-car truck and was ready for travel into the mine, moved by a haulage locomotive and accompanied by a car loaded with dust. C. R. Garrett, mine superintendent, and Charles Smith, mine electrician, are devoting a good deal of thought to the machine in the hope of developing it.

In experimenting with this and that at the Delagua mine of the Victor-American Fuel Co., in Colorado, men used their ingenuity with whatever parts and equipment happened to be handy. The result was a blower made from a 10-ft. oblong steel tank and a low-pressure rotary blower capable of delivering a large volume of air. Holes were cut in the ends of the tank to permit a large sheet-iron pipe to be inserted the full length of it. The tank was filled with dust and slots in this pipe were made to admit the dust. The stream of air passing from the blower through this pipe was intended to produce such a volume of dust that a uniform deposit would be made throughout the area traversed.

Difficulty was experienced in getting a steady feed of dust through the inlet slots, and the outfit was cumbersome and heavy. But it represented a trail-blazing effort which has led the company into the use of more advanced dusting devices. The Victor-Ameri-

#### **This Is the Way They "Mudize" in Stag Canyon**

A cement gun is used by the Phelps-Dodge Corporation to apply tailings from a nearby mill or adobe dust from the ground surface or a mixture of cement and sand, one to eight. Wet tailings are sprayed on roof and ribs of all main haulage roads, the surfaces having already been gunited. The machine, with a crew of three men, can cover 600 ft. of such entry in a day. The train consists of the supply car, cement gun, air receiver, air compressor, water tank and locomotive.







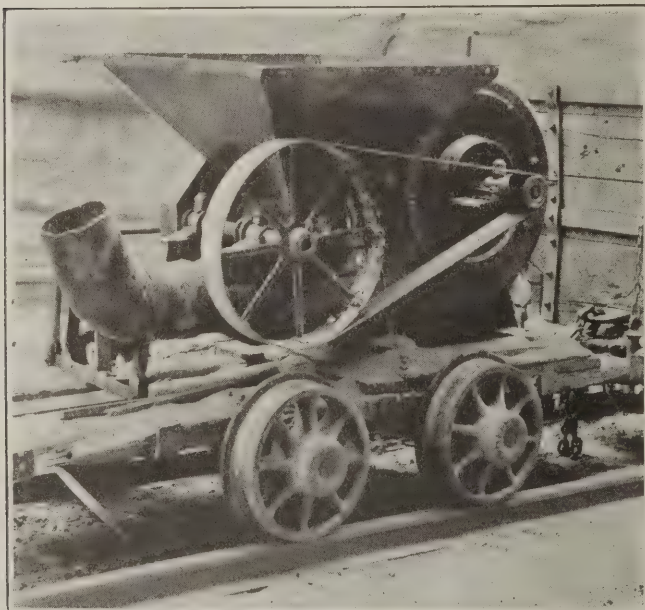
#### Machine Planned to Produce Large Volume of Dust

It was built at the Delagua mine of the Victor-American Fuel Co. from various parts and old equipment which happened to be handy. The blower sent a stream of air through a sheet pipe running through a tank. Dust from the tank was expected to fall through slots in the pipe and thus be caught in the air and discharged in a cloud into the atmosphere without particular direction. Dust could be shoveled into the tank when a top lid was raised.

can Fuel Co. experimented with rock dusting at Delagua long before the rest of the country had waked up to the value of the practice. Its work began as far back as 1911 when General Superintendent Ben W. Snodgrass was superintendent there.

Experiments in building dusting machines have been steadily progressing in the mine shops of the Union Pacific Coal Co., at both Hanna and Reliance, Wyo. Such dusters as had been built by late summer were able to deliver the dust, but they, too, suffered handicaps that had to be overcome.

At Hanna, Superintendent T. H. Butler first tried an ordinary forge blower turned upside down and driven by a small direct-connected motor. This blew a stream of air through a 5-in. pipe on top of which was mounted a funnel-shaped dust hopper with a capacity of about  $\frac{1}{2}$  yd. A short piece of stout, flexible tubing connected the outlet with a 4-ft. length of galvanized iron pipe equipped with a hand hold. With this the dust could



#### One Motor Drives Everything on Kenilworth Car

By means of a belt and a reducing gear on the opposite side of the machine, a revolving feeding device, set in the bottom of the hopper delivers dust at uniform speed and without danger of choking into the 12-in. pipe from the blower. This pipe is tapered to an 8-in. discharge and connects with a loose elbow which can be turned from side to side by the operator. Roof and ribs are washed down with water immediately ahead of this machine so that the dust sticks to all surfaces readily.

be accurately directed by an operator. The whole unit was mounted on a truck and accompanied by a car of unground surface dust.

To control the flow of dust and to prevent a back-draught of air from blowing up through the little hopper, a 4-leaf, revolving valve built on the order of a stove-pipe damper, was installed in the round pipe through which the dust descended into the air stream. This was first turned with a hand crank so that a man had to walk along beside it to run the feed. This extra man may be eliminated by gearing or belting the rotary valve to the blower motor.

That company has experimentally dusted parts of its properties with adobe dust from the exterior of the mines, screening but not grinding it. Finally it has been concluded that fineness is obligatory, so a pulverizer has been installed.

The Phelps-Dodge Corporation at Dawson, New Mex., the Utah Fuel Co. and the United States Fuel Co., both in Utah, and several other companies have done much experimental work with dusting machines of their own construction. Thus the Rocky Mountain region has many hands and heads busy and the 1924 crop of dusting devices is proving itself a "bumper."

### Washing of Freeport Coals Studied At Pittsburgh Experiment Station

A study of the washing characteristics of coal from the thick Freeport bed in Pennsylvania has been completed by the U. S. Bureau of Mines investigators working in co-operation with the Carnegie Institute of Technology. The tests were conducted at the Pittsburgh experiment station. Coal from this thick bed makes good metallurgical coke except that at some mines the ash content is usually too high, and at other mines sulphur is present in the coal in excess of the quantity permitted in metallurgical coke. Therefore, washing to remove the ash and the sulphur is an important and vexing problem to the coal-mine operators. The coal is mined for byproduct coking, steam-raising, domestic use, gas-making and other purposes. The problem in washing is to eliminate the fragments that in mining get into the coal from impure bands present in the coal bed, as well as impurities finely distributed in the coal from some layers of the bed. It was determined that the best treatment for coal with bony fragments was to make three products—clean coal for coking, secondary coal for use in boiler plants, and refuse.

### Salt Damages Walls of Coke Ovens

Salt is an impurity which occurs in many varieties of British coking coals. It consists principally of sodium and potassium chlorides, and on account of its ultimate effect on the brickwork of the oven walls it is desirable to eliminate it as far as possible. To do this, frequent change of the washing water is necessary, as in course of time the accumulation of dissolved chlorides in the water becomes excessive, and instead of washing reducing the salt content of the coal it actually increases it. The washing water itself therefore must be as free as possible from these constituents. On account of its salty nature, mine water is frequently quite unsuitable for washing purposes. —G. Stanley Cooper in *Byproduct Coking*.



# Elaborate Care Fails to Protect Gates Mine

Pipes Extended to Face of Every Working Place—Electric Detonators a Possible Cause of Explosion—Many Safety Precautions Provided—Recommend Better Supervision of Night Shift

A COMMITTEE of mine inspectors composed of Edward E. Girod and four others have submitted a report of their findings and recommendations covering the explosion which occurred on July 25 in the Gates No. 1 mine of the H. C. Frick Coke Co., at Gates, Pa. The other members of this committee were Richard Maize, Silas S. Hall, W. H. Howarth and Harry Phythyon. Their report submitted to Joseph J. Walsh, Secretary of Mines, of Pennsylvania, gives two probable causes of the explosion and makes certain specific recommendations.

The Gates No. 1 mine is in a gaseous territory. The Pittsburgh seam, which at this mine is 8 ft. thick, is being worked. The location is on the east side of the Monongahela River about twenty-five miles south of Brownsville. A shaft 250 ft. deep forms the main entrance to the mine. Ventilation is provided by a force or blower fan driven by steam which produces a pressure of 2.5 in. water gage. The inspector's report here reproduced describes the details of the mine layout and the conditions as observed by the committee.

The air is forced down a compartment of the main shaft, the airway being separated from the hoisting shaft by a concrete partition. The air after leaving the shaft is conducted for some distance along airways parallel to the main haulage roads but later enters these roadways which thereafter serve as intake airways. The air is conducted through the workings and then returns to the surface at outlets provided for that purpose. It is prevented from making a short circuit to the hoisting compartment of the main shaft by a series of doors on each main haulage road leading to the main shaft.

## EXPLOSION CONFINED TO ONE SECTION

The mine is divided into three sections to one of which, the North section, which is adjacent to the Palmer mine of the same company, the explosion was confined. About 51,600 cu.ft. of air per minute enters through No. 6 Butt entry and a parallel aircourse and is distributed throughout the workings of the section. This entry forms the longer side of the triangle occupied by the area described. It is also the roadway through which all the coal in the section is brought to the shaft.

On one side are two parallel airways separated from the rest of the mine by a barrier pillar. These two parallel headings are the return airways for that side of the triangle, the other side of which is bounded by an old gob. Another pair of adjacent headings, which are parallel to No. 6 Butt and on the same side as the rooms turned off that roadway, serve as return airways for that side next to the old gob and nearest to the hoisting shaft.

Rooms have been turned off No. 6 Butt and as a rule they have been driven north on the face, until they reach a boundary of the triangle. The first rooms turned off No. 6 Butt are short but they increase in length successively until No. 15 room is reached.

Thereafter each in its turn is shorter than the one that precedes it, No. 24 room being the last room turned. No. 13 room is about 1,500 ft. long, extending from No. 6 Butt to the apex of the triangle.

The rooms are crossed at frequent intervals by crosscuts and entries so that the triangle resembles somewhat a part of a huge checkerboard except that it is crossed by several diagonal entries which have been disregarded as a part of the plan of mining the coal in the area being described.

At the head of each room the process of extracting the room pillars has been going on for several months so that a gob extends along two sides of the triangle making two gob lines which meet at an apex at No. 13 room. The accompanying map shows the layout of the triangle.

Two parallel entries with brick-and-cement stoppings connect this triangular section with the main return aircourse of the adjacent Palmer mine, which is ventilated by an exhaust fan with a water gage of about 3 in.

## SMOKE ISSUES FROM AIRSHAFT OF PALMER MINE

About 7:30 p.m. on July 25 smoke was discovered issuing from the airshaft of the Palmer mine, and it was supposed at first that the smoke was caused by a fire or by an explosion in that mine. Upon investigation it was discovered that the smoke was the outcome of an explosion in the Gates mine in the section adjacent to the Palmer mine. One of the 13-in. brick-and-cement stoppings which had been built in these entries to separate the two mines was torn down by the force of the explosion and thus the smoke noticed at the Palmer airshaft was carried in the air current from the Gates mine.

In addition to the broken stopping in the entry leading to the Palmer mine the inspectors found evidence of much violence extending over a large part of the section. There was not much evidence of heat nor violence noticed along No. 6 Butt entry nor in the first few rooms turned off No. 6 Butt, although a number of brick stoppings were demolished along that entry. The violence was considerable in the central part of the triangular area and toward the apex of the triangle opposite No. 6 Butt entry. The heat seemed to increase toward the western corner of the triangle as was evidenced by the fused coal dust that was plastered on posts and other surfaces.

The forces and flame traveled in different directions but seemed to radiate from the neighborhood of No. 21 room, where six dead bodies were found. Near the end of that room one narrow place driving westward toward the gob had recently been cut by an electric shortwall machine. Another similar place 25 ft. farther back from the head of the room was partly cut and evidently this cut was being made when the explosion occurred. On the roadway of the room, between the place that had just been cut and the place that was being cut, many tangled detonator wires were found, indicat-



ing that about one hundred electric detonators were assembled together there, the leather case in which the detonators were carried by the shotfirers being found empty and in good condition at the head of the room. Most of the detonators were found to be destroyed.

#### SHOTFIRER AND ASSISTANTS FOUND IN SAME ROOM

Close by the bundle of detonator wires a place was found where a quantity of permissible powder had been burned. Apparently it had lain on the ground in the space between two ties in the track. The room was timbered with legs and crossbars at this place, and these timbers were deeply charred. Three flame safety lamps were found extinguished at this point also, indicating that the shotfirer and his two assistants were together here when the explosion occurred. One of the safety lamps and three exploded detonators were found under a piece of slate that had fallen from

the roof. This safety lamp was found lying on its side with its glass broken, but the evidence indicated that the slate fell after the explosion had started. There was no evidence that any shots had yet been fired in the working places.

It appeared from all the evidence available that while the shotfirer and his assistants were at this point in No. 21 room arranging their detonators and powder for convenient use a flame approached from some source which exploded the detonators and burned the permissible powder, although it may be that the detonators themselves initiated the explosion.

In addition to these three men, a cutter and his helper and a timberman were found dead in this room. A driller and his helper were found at the head of No. 19 room. Another cutter and his helper were found near the head of No. 12 room.

An accumulation of gas might have taken place in



Map of the Northern Section of the Gates Mine of H. C. Frick Coke Co. Where an Explosion Occurred July 25, 1924

The explosion blew out a 13-in. brick-and-cement stopping in a heading leading through the large barrier pillar between the Palmer and the Gates mines. This will be seen marked B. S. and Dm (Brick Stop-

ping and Demolished) near the left side of the plan. The explosion seemed to center from the neighborhood of No. 21 room, where six dead bodies were found. On the roadway of the room were the tangled

wires of about one hundred detonators, mostly exploded. Close by a place was noted where a large quantity of powder had burned, charring the legs and crossbars by which the place was timbered.



Room 21 where the six men were found, due either to a sudden outburst of gas caused by a heavy fall or to a gradual issue coupled with a disarrangement of the ventilation, which accumulation could have become ignited by an electric arc, or possibly by the accidental firing of the detonators. This explanation seems the most reasonable to the inspectors, but the evidence was insufficient to make this opinion positive.

The section of the mine under consideration is known to generate some explosive gas, but the ventilation had been restored when the inspectors explored the scene of the explosion on Monday, and they found no gas except at one place. Here it was issuing from the floor. There had been no explosive gas noted on the mine report books for this section of the mine since Dec. 14, 1923.

The H. C. Frick Coke Co. has spared no pains nor expense to make and keep this mine in a safe condition. Sufficient air was supplied to give adequate ventilation. A system of sprinkling with pipe lines and hose had been provided so that all the working places might be sprinkled with water before the shots were fired. A man accompanies the shotfirer for this

purpose. The coal is sprinkled by the loaders as they load it. It is cut and shot on the night shift. Permissible powder only is used for shooting. Electric cap lamps are used exclusively except by the officials and shotfirers who use flame safety lamps but one such lamp is furnished to each cutter in addition to his electric cap lamp. But, considering the quantity and character of the work being performed in this section on the night shift, the supervision was insufficient.

The inspectors close their report with certain recommendations suggested by their investigation: 1. That the ventilation be arranged so as to reduce to a minimum the chances of short-circuiting the air current. 2. That proper examinations be made and efficient supervision be provided for the workings on the night shift. 3. That the Federal Bureau of Mines withhold its approval of electric detonators unless the type submitted for approval provides against their being exploded accidentally by electricity. 4. That greater care be exercised in the handling of detonators and explosives. 5. That all electric wires and equipment be installed, maintained and operated so as to reduce the danger of arcing to a minimum.

## Engineers Study Needs of Industrial Centers in Coal Storage Report

STORAGE will assure a continuous and reliable supply of coal throughout the country, it is asserted in an analysis of the needs of communities and industries accompanying a series of summaries of regional conditions to be embodied in the report of the Coal Storage Committee of the American Engineering Council, of which W. L. Abbott, of Chicago, is chairman. The complete report, Ex-Governor James Hartness, of Vermont, president of the Council, said in making the announcement, would exceed 100,000 words, and would be made public following a meeting of the administrative board of the Council to be held at the headquarters of the Western Society of Engineers in Chicago, Oct. 17 and 18.

"From the standpoint of consumers in both large and small communities," according to the analysis, "the first requisite is that the supply should be freed from irregularities having their origin largely in artificial causes. There is a negligible amount of intentional manipulation of the market, but flurries and near panics are frequent. Consumers often are responsible."

### ESTABLISH AVERAGE MONTHLY STANDARD

The Engineering Committee has established a storage practice in leading industrial centers, using as a standard an average monthly shipment plan. As to this the analysis said:

"Evidently it is essential that the consumer store coal. The ideal practice would be for him to store during the summer a large portion of the amount consumed during the winter. But such an ideal is too much to expect, hence the committee has set up as a standard an average monthly shipment plan.

"Compliance with such a standard would mean that the consumer would store a minimum amount of coal and such would not be in storage for a great length of time; the transportation agencies would be relieved of the inordinate peak demands and would be enabled to move coal at less expense than now; the producer, knowing what his monthly demands would be, could

so arrange his operation schedules as to produce coal at a much lower cost per ton.

"Eventually, should such a practice become generally and regularly followed, the amount of storage required would be materially reduced, but this cycle of improvement can be initiated only by consumers."

The Chicago committee of the Council's main committee, it was said in analyzing conditions in that city, based its conclusions on data from fourteen representative industries having a consumption of 4,640,000 tons, representing 15 per cent of the total coal moving into the Chicago district.

"Only 6.7 per cent of the annual consumption of these industries should be stored if all of the users were purchasing coal on the basis of uniform monthly shipments," this committee reported. "This is a larger percentage than that pertaining to Philadelphia, but in comparison with most of the medium to large cities of the country it is a very low percentage.

"It means that if users generally in this district were purchasing coal on a contract basis with equal monthly shipments, the aggregate storage bill would be but a small amount when distributed over the entire year's supply. Undoubtedly some industries would be obliged to store a larger percentage, but the typical establishment is in a fortunate condition in this respect."

The uniform monthly shipment plan recommended by the engineers for Chicago, would, it was said, result in monthly shipments of 386,550 tons to 14 consumers, seasonal storage of 295,500 tons, amounting to 6.4 per cent of annual consumption, reserve storage 7.1 per cent of annual consumption and total storage 13.5 per cent of an annual consumption of 4,638,600 tons.

**TAR YIELD OF WESTERN LIGNITES.**—A large number of assay retort tests of samples of lignite taken from public lands in the Western states have recently been made by the oil-shale laboratory of the Bureau of Mines, Boulder, Colo. The Colorado lignites so far tested yielded from 8 to 10 gal. of tar to the ton. Samples of Wyoming lignite yielded as high as 20 gal. to the ton.



## Why Not Use Approved Equipment in Place of Open or Half-Safe Type?

Electricity Causes Many Disasters and Fires—To Date None Has Been Caused by Flashes from Permissible Apparatus—Lists Large Variety of Equipment Bureau Has Approved

A DISCUSSION of safe electrical equipment for gaseous and dusty coal mines is given in publication No. 2,626 by L. C. Ilsley, electrical engineer, U. S. Bureau of Mines. This paper starts by comparing the buying of approved equipment following a disaster to "locking the stable door after the horse is stolen," then goes on to discuss some recent accidents and their effect.

"An open type of electric coal drill was used in a gaseous mine in West Virginia. This was the probable cause of the death of twenty-seven men. A half-safe type of electric coal-cutting machine was used in a gaseous mine in Pennsylvania. This was probably the cause of the death of thirty-six men. An unapproved, unsafe type of flame safety lamp was used in a gaseous and dusty mine in Utah. This was the alleged cause of the death of 171 men. All three disasters happened within the last six months, and it would seem would have been avoidable if proper equipment had been used.

"It is understood that more rigid requirements will be enforced in West Virginia. The committee of state mine inspectors made definite recommendation for improving the conditions in the Pennsylvania mine to which reference has been made. The Industrial Commission of Utah has already issued new orders which will prevent the use of unsafe lamps in that state.

"These acts and recommendations are all good and will help to prevent accidents in those states in the future. Is it not a pity that such recommendations and orders were not made a little earlier before the toll of life had been exacted? Is it not unfortunate that other states will not take these lessons to heart and safeguard their mines before and not after disasters take place?

"Electric current can cause accidents in five general ways as follows: (1) By shock to persons; (2) by igniting powder; (3) by igniting gas; (4) by igniting coal dust; and (5) by setting fire to flammable material such as timber and coal. Many accidents from these causes are preventable if proper care is taken. Most of the accidents caused by sparks and flashes from electrical apparatus would not take place if approved electrical equipment was used. By approved equipment is meant equipment that has been tested and formally approved by the Bureau of Mines. So far as known, up to the present time, no disasters have been caused by sparks or flashes from equipment having the Bureau's approval.

"The table accompanying this article and compiled by M. W. von Bernowitz from records of the Bureau of Mines covering the period 1910 to 1924, shows disasters and fires caused by electrical apparatus and circuits.

"The table shows that in the twenty-six accidents reported, 499 lives were lost and 86 other men were injured; besides there was much damage to property.

"During the past fourteen years the Bureau of Mines has, in co-operation with manufacturers of electrical machinery and equipment for mines, conducted thousands of tests on various machines and apparatus submitted by the manufacturers to determine whether the device is safe for use in explosive atmospheres. If the

machine, or any part of it, is not safe, the bureau and the manufacturer work together to eliminate the unsafe features. When the machine finally passes the bureau's test, it is formally approved for use in coal mines where hazards from gas and dust occur. Several classes of equip-

ment have been tested, and there is a steadily growing list of approved equipment recommended for use wherever such equipment is needed.

"The electrical equipment so far formally approved by the Bureau of Mines includes five storage-battery

Disasters from 1910 to 1924, Inclusive, Attributed to Electrical Apparatus and Circuits

State	Probable Cause of Ignition	Fatalities	Injuries
Wash.	Arc from booster-fan motor ignites gas.....	10	..
Ill.	Arc from short-circuited trolley wire sets fire to ventilating door.....	31	..
Ohio	Arc from bare cable sets fire to "sulphur" band (a).....	16	..
Wash.	Arc from trolley wire ignites gas.....	8	..
Pa.	Arc from trolley wire ignites gas.....	82	..
W. Va.	Arc from trailing cable ignites gas.....	6	3
W. Va.	Arc from filament of electric-light bulb ignites gas.....	2	..
Ky.	Arc from trolley wire ignites powder.....	3	..
Mo.	Arc from office-fan motor ignites gas.....	1	..
Pa.	Arc from pump-motor controller ignites gas.....	19	..
Pa.	Arc from trolley wire ignites gas.....	18	..
Ala.	Arc from switch ignites gas.....	14	..
Pa.	Arc from trolley wire ignites gas.....	4	..
W. Va.	Arc from trolley wire ignites gas.....	7	..
Ind.	Arc from defective cable ignites gas (b).....	5	..
W. Va.	Arc from trailing cable ignites gas.....	..	..
Utah	Arc from short-circuited wire ignites timber (c).....	..	..
Pa.	Arc from hoist motor ignites gas.....	90	70
Ala.	Arc from electric wire caused by derailed trip ignites coal dust.....	..	13
Kan.	Arc from battery of storage-battery locomotive ignites powder.....	120	..
N. M.	Arc from electric-power wire caused by runaway trip ignites coal dust.....	27	..
Okla.	Arc from short-circuited power wires sets fire to coal (d).....	36	..
W. Va.	Sparks from electric-drill motor ignites gas.....	..	..
Pa.	Arc from electric mining machine ignites gas.....	..	..
Pa.	Arc from short-circuited trolley wire sets fire to ventilating door (d).....	..	..
Pa.	Sparks from electric coal-cutting machine ignites gas (d).....	499	86

(a) Mine sealed for months. (b) Several acres of workings sealed for months. (c) Besides being closed for months, much damage was done to workings. (d) Part of mine sealed.

locomotives, one power truck, two coal drills, nine short-wall mining machines, one arcwall mining machine, four cap lamps, two hand and trip lamps, and two single-shot blasting units. A complete list with more detailed information can be found in Bureau of Mines Technical Paper 364. This paper is in course of publication and a copy of it can be obtained free of charge by writing the Director of the Bureau of Mines, Washington, D. C."

## Coal and Coke in House-Heating Plants

Accurate data on the effectiveness of combustion of bituminous coal and coke for generating steam under hand-fired low-pressure cast-iron boilers of a type actually used in heating large buildings have been obtained as the results of a study at the Pittsburgh station of the Bureau of Mines. The experimental work has been under way since early in 1922. The effectiveness of different methods of firing the different coals tested was determined, as well as the relative value of the different fuels used. The results showed that the bituminous coals from the Pittsburgh and Lower Kittanning beds, of Pennsylvania, and the coke were of about equal steaming value at the lower pressures but at medium and higher pressures permissible with this equipment, the coke had about 90 per cent of the steaming value of the bituminous coal.



# Texas Lignite Field Sets Steam Shovel to Work

Stripping Methods May Eliminate Underground Mines in Parts of Texas for the Overburden Is Often Light

BY HOWARD MARSHALL  
Austin, Texas



Shovel of Western Securities Coal Co.

ONE of the most important events in the history of the Texas lignite industry is the opening and successful operation of the strip mine in the Rockdale lignite fields by the Western Securities Coal Co., a subsidiary of the McAlester Coal Co., of McAlester, Okla. The importance is due to the fact that by this new process, it has been estimated lignite coal can be mined for from one-half to two-thirds, or even less, as much as by the established mining methods now in general use throughout the state.

As the result of the ability of this new strip mine to produce coal so cheaply, prices on lignite coal have been slashed to unprecedented depths. The city of Austin, which is the biggest single user of lignite in the state, before the opening of the price war, paid \$1.50 per ton, f.o.b. at the mines; now it pays \$0.96 per ton.

In the Texas lignite mines, the coal is extracted from depths varying from 50 to 300 ft. by means of shafts, and by hand labor. The producing cost of lignite by this method is from 50 to 60 c. per ton; by the new stripping method, it is estimated to be not more than 40c. per ton. Reliable authorities declare that the Western Securities people can produce lignite at 20c. per ton as soon as the markets justify greater production.

In order to meet the competition, the majority of the lignite operators in the state have cut the pay of the diggers from 30c. per pit car of 1,600 lb. to 25c.

Until the coal had actually begun to leave the stripping few people believed that the venture of the Western

Securities company would be a success. They believed that this attempt to strip mine coal would result as did that of the Federal Fuel Co., which proved to be one of the most tragic stories of failure in the history of the Texas lignite industry.

The plan of the Federal Fuel Co., organized in 1918, differed from other types of stripping mainly in the kind of machinery which it proposed to use. Two giant devices, not steam shovels, strip-mined the coal and loaded the coal cars in the mine yards.

However, misfortunes followed closely on the heels of these adventurers in strip mining. The machinery broke, adverse weather conditions hampered the work, and just as it seemed that the project would succeed, the treasury of the company became exhausted, and the whole scheme had to be abandoned. The total loss sustained by the company officials totaled half a million dollars.

The Western Securities Co. came into the Rockdale lignite field about a year ago when it leased the property of the Federal Fuel Co. This property consisted of 1,938 acres, of which 748 acres were actually tested by the process of sinking small wells at various points. The bed is 14½ ft. thick, and most of it is overlaid with 20 ft. to 40 ft. of sandy clay, which is easily stripped.

According to claims advanced by the Federal Fuel Co., this field contains 20,000,000 tons of the finest lignite coal in the state. President Puterbaugh has

## Stripping 15-Ft. Seam

Overburden is about 25 ft. thick though it hardly seems so, judging by the thickness of the lignite. Note the cars on the lignite berm and the stripping shovel in the rear. This scene is on the property of the Western Securities Coal Co., near Rockdale, Texas. The use of shovels is lowering the cost of producing lignite considerably, wherever as here the lignite is thick and the cover merely enough to keep the bed in good condition.







#### Another View

This, taken from above, gives a good idea of the thickness of overburden. The loading shovel can be seen excavating the lignite in a cut 15 ft. lower than the big stripping shovel which is kept 50 yd. ahead of the loading equipment. The photograph was taken when the stripping shovel was still making its first or "box" cut.

been quoted as saying that there is enough lignite in this bed to supply all the industries of Texas for the next ten years, at the present rate of consumption.

The property is located about six miles from the main line of the International-Great Northern R.R., and approximately nine miles from Rockdale. The Western Securities has rebuilt an old spur from the main line to their mine at Sandow, and have incorporated it under the name of "The Rockdale, Sandow, and Southern."

Machinery of a value of more than two hundred thousand dollars has been moved in by this new company. This equipment includes: Two steam shovels, one standard locomotive, and a large number of tools for use in the machine shops of the company.

The strip which has been opened is at present perhaps a quarter of a mile long, 80 ft. wide, and 40 ft. deep. The overburden of the lignite here is at least 15 ft. The shovels can uncover and mine, in an eight-hour day, about 25 ft. of the lignite.

The large shovel rests on the bed of lignite which has been uncovered, and which has been swept smooth by two men working with steel brooms. It keeps about fifty yards in advance of the small, coal-removing shovel. The track, on which the coal cars are moved into the long strip down an incline, rests on the top of the bed of coal, just to the right, and above the small shovel. At the present time, these cars are moved by the short pushes of the big dipper of the small shovel, but it is said that the company will presently purchase another locomotive to do this work.

According to State Mine Inspector N. M. Bullock, of Rockdale, Tex., these cars can be loaded in 12 min-

utes. As the average coal car will hold about 40 tons of lignite coal, the shovels can uncover, at this rate about 1,200 tons of lignite coal in one day of eight hours. Allowing for unforeseen delays, each day should see 20 cars of coal leaving the strip. And by simply stringing lights across the cut, and by working three shifts of men, at least 2,400 tons of lignite coal can be mined in a 24-hour day.

Industrial chemists have recently analyzed samples of the coal from the strip at Sandow, and have declared that it contains practically the same number of heat units as that which comes from the deeper stratas of lignite. The lumpy condition of the coal will probably necessitate the use of crushers for use with furnaces which are mechanically stoked.

The rising prices of oil are inducing a number of power plants, which have heretofore used fuel oil in their furnaces, to introduce lignite. In other words, because of its two hundred thousand dollar investment, the Western Securities people do not wish to slash lignite prices further, as long as there is a reasonable market for their output. It is due to these factors, in the opinion of many mining men, that the small operators are still enabled to compete with the big strip at Sandow.

But with the coming of the dull months next winter, a hard season is foreseen for the shaft mine owners. There is little doubt that the strip can produce coal far more cheaply than they. And when the annual market depression comes to the lignite industry, the keener competition, it is believed, will close many of the small mines. Some mining authorities are of the opinion that other strip mines will be opened quickly in imitation of the example set by the Western Securities people. If this is done, Texas will witness the most radical change in mining methods that has occurred in the history of the industry.



Tippel and Power House, Consolidated Coal Co.

This mine near Rockdale is somewhat typical of the lignite mines of Texas. The surface structures are usually light and impermanent.

COAL-DUST EXPLOSION GALLERY IN INDIA.—Consequently on a severe explosion at Parbelia Colliery in the Ranganj coal field which killed seventy-four persons and was ascribed largely to coal dust, a committee was formed to study such dangers. The committee had had built a gallery 150 ft. long and from 3 to 4 ft. in diameter on a site near the headquarters of the Department of Mines at Dhanbad. The Parbelia Colliery is about 1,500 ft. deep. All the galleries are now being stone-dusted with shale ground to the necessary fineness in a ball mill.—David Penman, *The Mining Institute of Scotland*.



# Making Power Contracts That Will Save Your Purse

Power Schedules Should Be Selected with Care—Large Savings Often Can Be Made by Buying Under Two Schedules—Contract Must Be Based on Intimate Knowledge of Conditions at Mine to Be Supplied

BY W. H. RUSSELL  
Farmington, Ill.

**A**MONG the many ways the electrical man can effect economies at a coal mine, two are of prime importance, viz., efficient purchase or generation of power and elimination of unnecessary energy losses. The schedule under which power should be purchased is the subject of this article.

This is important because large sums often can be saved with no expense or trouble except the time necessary to make a study of the local conditions under which the power is used and of the different power schedules under which it may be bought.

In the purchase of central-station power large sums of money are often wasted by the selection of the wrong schedule or the use of but one when two different rates might better be selected. Most power companies have several different schedules available, and, though they are usually willing and anxious to help the consumer of their product to select the most advantageous rate, they are quite often unacquainted with the peculiarities of each coal-mine load and make incorrect recommendations. Likewise, the coal-mine executive is often unacquainted with the peculiarities of power rates and is sometimes resigned to the habit of regarding power bills as a necessary evil rather than a chance to make substantial savings with practically no expense.

## SLIDING SCALE GENERALLY USED

Though there are many different forms of power schedule, most of them are alike in that they consist of two parts, viz., a demand charge and an energy charge.

One schedule commonly known as the estimated demand rate is probably that most generally used; it consists of, first, a method of making a fixed annual or monthly demand charge and, second, a method of allotting, in proportion to the maximum demand, the total consumption of power to a sliding scale.

With this schedule, the maximum demand is based on the active load which is a certain percentage of the total of all motors or other power-consuming machinery connected to the system. This percentage generally takes into consideration the number of motors or other devices in use and other factors which might have a bearing on the probable maximum demand for power by the whole system.

At best, this is a haphazard method with much chance for unfairness to either party to the contract. There is always more or less trouble concerning changes in the connected load, especially when another locomotive is placed in service or one is taken out of service. A change should be made in the demand charge whenever the connected load is increased or decreased, but this is liable to happen so frequently that it will be neglected with loss to somebody.

In spite of the clumsiness of this method of determining the demand charge, it is quite generally used, and often the reason for its selection is that the low rate for the actual energy consumed is attractive.

When the mine works steadily at full capacity, the demand charge is not burdensome because it is counterbalanced by a large energy consumption which often results in a low average cost per kilowatt-hour; but if the mine has to be shut down or the tonnage reduced part of the year, the demand charge is often a heavy burden, particularly if nothing is running but a few pumps and the fan. Usually, on such occasions, the fan is run only a part of the time and then at reduced speed.

The second schedule is based upon a measured maximum demand and automatically takes care of any change in the connected load. The actual maximum demand figure used in computing the bill may be established monthly or yearly or for whatever period of time is fixed by the power company.

By this method the maximum demand is measured and recorded continuously on a chart driven by a clock, and the demand thus obtained is used in computing the bill by various methods. Generally the maximum demand is used to determine the quantities to be charged at the different rates, thus:

First 30-hr. use of max. demand .....	3,000 kw.-hr. at 10c. per kw.-hr.
Second 30-hr. use of max. demand .....	3,000 kw.-hr. at 7c. per kw.-hr.
All in excess of 60-hr. use of max. demand .....	44,000 kw.-hr. at 2c. per kw.-hr.

Various discounts are then allowed for prompt payment, limited-hour service, quantity used, power-factor correction, etc.

## WHAT CONSTITUTES MAXIMUM DEMAND?

Maximum demand is a term which is commonly misunderstood. The general understanding seems to be that it is the instantaneous maximum load. This interpretation, except in rare cases, is wrong. The maximum demand is the average load for a given time interval, usually 30, 15, or 5 min., or in the case of violently fluctuating loads an even shorter interval of time. Thus a motor with a steady load sufficient to cause it to use exactly 50 kw. would register a demand of 50 kw., regardless of the time interval. If the demand meter is fitted with a time-interval indicator of 30 min. and the load were reduced to nothing for the first half of the 30 min. and increased to 100 kw. the second half, the recorded maximum demand would still be 60 kw. during this particular 30-min. period.

The energy charge on these schedules is applied by a sliding-scale rate based on the power used, so that the higher the consumption the lower the average rate up to a certain point; after this point is reached, the charge is usually a low rate per kilowatt-hour for the entire quantity used. Some consumers of power think this a very expensive rate, but under certain conditions it has decided advantages; principally at mines where the output of coal is large for but a few months of the year. The rate per kilowatt-hour may be somewhat



high during operating periods, but the demand charge during the slack months may be eliminated, and the result is an advantage for the entire year.

When using the measured demand rate it is sometimes practical to reduce the total power bill by cutting down the maximum demand by reducing the tonnage, but in the case of the estimated demand rate any change in the load and demand charge usually means a conference with the power company and a complete change in the contract, which soon becomes burdensome, and is likely to be neglected.

In case of the complete suspension of mining operations the measured demand rate system is very convenient and at the same time economical because the pumping and ventilation load may be so regulated as to keep the demand down to a minimum. At the same time the occasional use of a hoist or locomotive will not increase the maximum demand, if other equipment is first shut down, whereas the estimated demand rate fixes a demand charge in proportion to the total of all the equipment which is connected and in running order. If the rule be strictly enforced this prohibits the occasional use of hoists and locomotives and also prevents any reduction of the demand charge during a suspension.

Some power companies permit the use of two separate rates. This is a benefit to many coal-mine consumers as invariably the class of load which is steady earns a much lower rate than one which is subject to violent fluctuations or which is on but a few hours of the day. Most coal mines which use electric power to any great extent have an abundance of both the steady and the intermittent loads and can take advantage of the two rates, if they are permitted to do so. The steady load, of course, consists principally of fan and pump motors. Fan motors consume an enormous quan-

Table I—Showing Cost of Power for Various Purposes

Type of Service	Energy Consumed in Kilowatt-Hours	Cost in Cents per Kw.-Hr.	Total Cost
Ventilation.....	72,910	1.68	\$1,229.34
Cutting and haulage.....	130,531	2.5	3,263.29
Pumps and misc. equipment.....	10,880	2.5	272.00
Total.....	214,321	Ave. 2.22	\$4,764.63

tity of power and usually constitute a 24-hr. a day load, which is extremely desirable to the power company and permits of a low rate. Mining machines, locomotives, hoists, etc., work only when coal is being hoisted and do not earn so low a rate as a fan.

It does not cost a power company much to have two separate metering equipments and where two schedules are available the average coal-mine consumer does well to take advantage of them.

Table I shows the quantity and the cost per kilowatt-hour of all the power purchased at a mine of 1,000 tons daily capacity in a 4-ft. seam during the year 1923, when there were many idle days. This power was purchased under two separate contracts and metered separately by the power company. The principal expense in connection with the additional metering equipment was for one extra meter and two current transformers at a total cost of less than \$100.

It will be noted that ventilation earned the lowest rate, using nearly 56 per cent as much power as used by cutting and main haulage equipment. As a check on results, the power bills are figured according to each rate every month and for the year 1923. The cost of the power, if it had all been purchased on one of the

schedules, would have been \$5,358.03, and had it all been purchased on the other rate, the cost would have been \$7,149.36. This scheme has been working for several years at two mines owned by the same company and has never failed to show a greater saving than that in 1923.

At another mine an additional discount of 15 and 5 per cent is allowed from the power bills because no power is used between 4 p.m. and 8 p.m. during the winter months. This offpeak service is not always permissible but, if available, it may be applied to service supplying power for mining machines, locomotives and hoists used only during the day.

The purchase of power must be treated as a specific problem for each mine and in order to arrive at the best solution one must be familiar with the power requirements and how they will be influenced by probable market conditions. The anticipated installation of additional machinery, as well as the technical side of power consumption and rates, also must be considered.

## Pays for Slate and Slack Removed

IN GREAT BRITAIN, as in the United States, the retailer of coal is under fire, Mr. Shinwell, the Secretary of Mines, charging that the prices are excessive. In a reply by the Coal Distributors' Information Department, 27 Southampton St., London, W. C. 2, entitled "The Price of Coal" (16 pp. paper bound), the whole question as to retailing costs is discussed and it is stated that the average net profit of six representative London coal merchants has been shown to Mr. Shinwell as approximately 18c. for each ton of coal over a period from 1921 to 1923. A practice, apparently general in Great Britain, is to screen the coal at the retailer's yard, the men being paid 36c. per ton for all small coal thus obtained, this payment being additional to the wage rates for the work of loading. Similarly the men are encouraged to pick out slate by a payment of \$2.42 (10 shillings) per ton of slate picked. "From these facts," says the booklet, "the desire and the effort of the merchants to send out the coal in satisfactory condition must be apparent; it is not a question of altruism, but of common sense, the satisfaction of customers being essential to continued custom."

## Will Try to Find Better Refractories

A co-operative agreement has been made between the Department of the Interior and C. A. Hirshfield, of Detroit, representing a group of large central power-plant operators, to make a survey of present conditions relating to the use of power-plant refractories. The survey will be conducted by engineers of the Bureau of Mines. With the present high ratings at which boiler plants are being operated and the increasing use of pulverized coal with its attending high temperatures, the refractories now available for lining boiler furnaces are proving inadequate. In this survey a study is being made of the characteristics of refractories now available for use in power-plant boiler furnaces, and the conditions under which they are used, their life in operating practice under the conditions prevailing at different plants and the way in which the refractories now marketed fail to meet these conditions. The purpose of the survey is to obtain fundamental data to be used in bettering refractory service.



# France—Its Present Attitude Toward Germany and Its Reconstruction Achievements

BY E. J. MEHREN

Vice-President, McGraw-Hill Co., Inc.,  
New York City

COMING to France after visiting Germany and noting there the transformation of spirit and the indications of reviving strength, one naturally asks whether the French, if aware of these developments in Germany, are formulating a policy that will work toward a peaceful solution of their differences. As everyone knows, the French policy to date, no matter how justified to the French mind as a means of forcing reparations or insuring security, has built up a hatred of the French in Germany. Such a feeling, taken in connection with the growing strength east of the Rhine, bodes no good for Europe.

Do the French realize what has happened in Germany? Do they foresee the possible results of the growing enmity? What policy are they formulating that will, peacefully, meet the situation? These are questions that force themselves on the visitor who, leaving Germany, comes to France.

The French do realize what has happened in Germany; they are watching Germany more closely than is any other nation. The result is what might be expected of men who do not blind themselves to the facts; a growing opinion that France must develop a harmonious relationship with Germany. The view is not yet very articulate, but Herriot's more conciliatory attitude, as contrasted with Poincaré's, is tangible evidence of the growing feeling. Force is seen to be ineffective; the invasion of the Ruhr is conceded to have been a blunder.

## COMMERCIAL TREATIES LOGICAL

The more friendly development, it is felt, should begin with commercial treaties, possibly commercial alliances. The German steel mills in the Ruhr, for example, can get their cheapest iron from Lorraine, now a part of France; Lorraine, on the other hand, needs German coal and can find the best market for its iron in the Ruhr. What more logical, then, than to come to agreement and to facilitate the co-working of these economically allied iron-mining, and coal- and steel-producing districts?

How much farther, if this step be accomplished, the relationship may and should go is hardly yet the issue. There is a feeling growing that a friendly relationship between the two nations must be worked out. Some—and they are of the school of Caillaux, the former premier, who was banished during the war because of pro-German activities—favor the formation of a Franco-German Alliance.

Of course, there are opponents, like Poincaré and his followers, of any plan

that looks with reasonableness upon relations with Germany. Poincaré however, has lost ground. The last election showed that the French want to try a new method of dealing with Germany; and the tide, judging by what could be learned here in Paris, is still setting away from Poincaré and toward the development of amicable relations.

Unquestionably, such a relationship between these countries would be the



Row of Miners' Houses near Lens

The "cities" around Lens, for which British and Germans fought so bitterly and which the Germans demolished so completely, are rebuilt, with the solidity, permanence and grace characteristic of the continent of Europe.

best assurance of peace in Europe. This the French are beginning to admit. It is a hopeful sign.

## FRANCE WANTS SECURITY

Repeatedly, in discussing these matters, it was impressed upon the visitor that France has no commercial jealousy of Germany, and that her sole desire is for security against German aggression. The reparations difficulty would long since have been adjusted had security been assured. This desire accounts, in part, for the Ruhr occupation, though the invasion was defended as a means of securing reparations payments. The Ruhr is the great steel center, the Pittsburgh, of Germany. In control of this district, France could prevent material preparations for war. It seems likely, however, that she will soon retire from the Ruhr (The London pact was concluded after this was written) and the question of security will be left to later conference, possibly under the auspices of the League of Nations.

But security she does want and until she gets it, through agreement with other nations or German alliance, it will be the controlling motive of French policy.

## RECONSTRUCTION ACHIEVEMENT

Admiration was recently expressed in these letters over developments in Germany. But no less should be the admiration of the French; they have done a mighty work in rebuilding the devastated regions.

Four years ago I stood in Lens, on the site of the Hotel de Ville (the city

hall), and surveyed in every direction the worst destruction I had seen in France. It was a city beaten flat, the streets obliterated, with no vestige of the pit heads that had once marked this, the richest of France's coal mining districts.

This week I stood on the same spot. Round about was an entire new city, housing as many people as before the war. There were gaps here and there, where new buildings had not replaced the old; there is work under way in almost every street, on pavements, or sidewalks, or services; there are large buildings still under construction, new churches, and two banks; but for practical purposes it is a complete town, a town resurrected and at work—resurrected and at work where only desolation had reigned four years ago.

Striking as is the impression within the city of Lens itself, the impression is even stronger when one motors to the heights of Notre Dame de Lorette (where 100,000 French soldiers gave their lives during the war) and looks down upon the whole area. The landscape as far as one can see is dotted close with new red-roofed towns, each surrounding the shaft of a single large mine. The impression would draw admiration from the dullest—admiration of the energy, the determination, the courage, the perseverance of the people of France.

Of course, the scars of war are still visible. Remains of trenches are found in Lens and in the country round about, while from the tangle of No. 11 shaft one can trace the wide swath of waste land—No Man's Land—where ran the main trench line, established when the English took Loos in the terrific fighting of September, 1915. Part of this trench line will be allowed to remain forever as a permanent memorial of the war.

## MINE RECONSTRUCTION

Much remains, too, to be done in the way of completing the reconstruction. Sidewalks are missing in large part. Many streets are unpaved or only temporarily paved. The churches and the municipal buildings are in hand only now or not yet started, the first efforts being put upon the recovery of the mines and upon housing. Probably two years more will be needed, in the Lens district, to finish the work.

To reinforce the general observations about progress, a few statistics will be given. The company operating the Lens concession (16 mines) will be taken, as an example. The Lens company before the war employed 12,300 men underground and mined 370,000





### Business Section in Lens

A few scaffolds attest that something yet remains to be performed, but Lens bears little sign today of the destructive hand of the invader. Reconstruction has gone on apace despite the delay in the payment of reparations.

metric tons of coal per month. On May 1 of this year, 10,458 men were at work underground, and the monthly tonnage was 175,000 (working conditions are still quite unsatisfactory). Of the 8,300 houses for workmen, 7,490 have been rebuilt and the population of the mine towns (32,250 in 1913) is now 30,284. Thirteen out of the 23 destroyed working shafts have been repaired, the headworks completed and put in service, and so have eight out of the 12 ventilating shafts. Of 35 million cubic meters of flooding water 31 million had been removed.

For French coal mines as a whole, the reconstruction figures show even greater progress than that of the Lens company. Of 200 mines destroyed, 145 are again producing coal, some of them, however, with temporary installations.

In the rebuilding of the tipples, electric substations, washhouses for the workers and the other necessary structures the best construction and the latest equipment have been employed, so that the Lens area has the unique distinction of a whole district modernly equipped. The plant layouts are impressive for their substantial character and the entire absence of the timber structures and shabby buildings so characteristic of our mines. All the buildings are of brick, both the mine structures and the homes for the workers.

### GENERAL RECONSTRUCTION

This picture of reconstruction is matched in every part of the destroyed area; in many districts, of course, there were no industries, so that this side of the Lens development is missing. For the whole of the destroyed region the figures stand as shown in the accompanying table.

Progress of Work of Reconstruction in Devastated Regions		
	Total Work to Be Done	Finished Jan. 1, 1924
Houses and farm buildings .....	741,900	605,900
Farm land to be reclaimed, hectares..	1,923,000	1,788,000
Factories to be rebuilt .....	22,900	20,872
New roads, kilometers	58,697	42,360
Railroad and other engineering structures .....	6,125	4,800

Finally, the population of these areas, which before the war had been 4,690,000 and which had declined to 2,075,000 at the time of the Armistice, has now risen (figures of Jan. 1, 1924) to 4,253,000.

One other comment needs to be made that the appreciation of the French accomplishment may be complete: France has, herself, raised practically all the money required for this reconstruction. Her reparation receipts from Germany have covered only a relatively small part of the cost.

This is a great accomplishment and one that explains the French insistence upon reparation payments. She was the chief sufferer and if her budget is now unbalanced it is because of her reconstruction charges. No wonder, then, that Poincaré had a strong following in his pressure on Germany. Would not any people who had placed upon themselves this very heavy burden tend to view the matter as they did. Let it be remembered, too, that in the wrecking of these regions France lost heavily of her income, for while the destroyed area was only one-fourteenth

### Garden Village at Lens

The permanent but box-line houses of this coal-mine town have the elaborate fences so common in French mine villages. The road is carefully made. In too many of our towns the feet of horses and pedestrians tread out the pathway and roadway.



### Compares Output Records In Kanawha Field

An interesting comparative statement of productive performance, showing the average yearly output in tons

per man during 1923 in connection with the operation of several mines in the Kanawha field of West Virginia has been prepared by A. O. Wilson, statistician of the Kanawha Operators Association, as follows:

### Comparative Statement of Average Yearly Output per Man in 1923 in the Kanawha Field

	Loaders	Cutters	Pick Miners	Inside Daymen	Outside Daymen	All Men
Co. A.....	2,030.0	29,523.0	1,995.7	2,924.9	6,764.4	981.1
Co. B.....	1,628.1	25,537.7	.....	3,120.6	5,559.2	828.8
Co. C.....	1,272.2	8,447.1	.....	1,270.4	3,274.3	488.6
Co. D.....	1,814.1	16,501.8	.....	2,492.4	4,730.2	806.1
Co. E.....	1,967.6	26,847.3	.....	3,522.6	8,678.8	1,048.9
Co. F.....	2,055.2	21,356.4	.....	5,424.7	6,663.2	1,144.0
Co. G.....	1,745.2	17,187.7	1,370.5	7,031.6	5,105.3	896.8
Co. H.....	1,417.1	14,742.4	.....	4,429.8	5,730.3	1,016.6
Co. I.....	2,298.2	23,509.8	.....	6,197.8	9,773.9	1,287.2
Co. J.....	796.2	13,495.1	.....	3,729.4	3,112.9	818.4
Co. K.....	2,125.3	22,017.4	.....	3,964.5	10,610.0	1,106.0
Co. L.....	1,792.7	21,302.1	2,189.6	4,518.0	7,168.3	1,075.0
Co. M.....	1,641.9	12,160.1	1,956.9	3,313.5	3,096.2	688.4
Co. N.....	1,970.9	19,981.6	.....	3,744.4	4,484.4	889.3
Co. O.....	1,142.7	14,271.1	.....	5,176.2	5,577.8	663.9
Co. P.....	1,222.6	24,548.0	.....	3,133.0	4,428.7	917.4
Average for fifty-two mines...	1,910.1	21,659.6	1,325.6	3,915.9	6,609.4	1,003.7

In the above statement *italic numbers* are below the average, and only one company registers "Clear."



## Resistance of Mine Headings To the Flow of Air

In Smooth Roadway Coefficient Only 0.000,000,003,6—  
Rough Floor Will Add 10 Per Cent—Cutting  
Out Crosscuts Reduced Friction 6 Per Cent

By J. W. PAUL, G. E. MCELROY and H. P. GREENWALD\*

IN 1922, the Bureau of Mines commenced an extensive research on coal-mine ventilation factors, large-scale tests being conducted in its experimental mine near Bruceton, Pa., over a period of two years. No. 2 butt entry in the experimental mine was selected as the section in which the tests were to be made. The entry had been driven by miners working under the union scale, the coal being undercut with a puncher machine and shot in the usual way. The butt entries are not driven parallel to the coal faces but at an angle of 10 deg. to the right, and the coal breaks along the faces and butts giving a kind of saw-tooth contour to the rib. There were recesses at intervals for the 8 x 8 in. posts used in the coal-dust explosion tests, and there were also instrument stations every 200 ft. which had a concrete front wall about 10 ft. long flush with the coal rib.

The roof was not timbered and was about as rough as the roof would be in any similar mine entry which had not had heavy falls. The usual mine track lay on the floor, the gage being 42 in. At the beginning of the tests the floor was fairly clear of loose spilled material but later became rougher. The entry was fairly straight, the greatest deviation of actual center line from survey center line being about 2 ft. There were cut-throughs to No. 1 Butt every 100 ft. which had airtight stoppings in them. This left dead ends about 20 ft. long opening out at intervals of 100 ft.

### UNUSUAL CARE TAKEN TO GET TRUE RESULTS

The test section was 335 ft. long and the two ends were trimmed so that they had the same cross-sectional area. The test method consisted of measuring the loss in static pressure between the two ends of the section simultaneous with the measuring by pitot tube of the volume of air flowing through the section. An air measurement station was constructed in No. 1 butt, all the air having to pass it and all the instruments were placed there. The development and trial of instruments and test methods took up much of the time and was responsible for many delays and repetitions. The results obtained and reported here are probably accurate within 2 per cent and are thoroughly reliable.

The coefficient of friction or friction factor for the section was computed from the formula:

$$k = Cd = \frac{5.2 AH}{SV^2}$$

where

- A = Cross-section area in square feet.
- H = Loss of pressure in inches of water.
- S = Rubbing surface in square feet.
- V = Average velocity of air in feet per minute.
- d = Weight of air.
- C = True co-efficient of friction.
- k = Co-efficient of friction as ordinarily used.

The value  $k$  involves the weight of air while  $C$  does not. The cross-sectional area was taken as the average of measurements made every 5 ft. and the rubbing surface was taken as the product of the length of the

section and the average perimeter determined in the same manner as the area.

The friction factor or coefficient of friction,  $k$ , was determined for this entry and was found to be 0.000,000,003,6 with air weighing 0.075 lb. per cubic foot. It was also evident that variations in the roughness of the entry would cause more difference in the value of  $k$  than variations in the weight of air which are normally met with except possibly in very deep mines or at high elevations.

The value just given was for an entry with reasonably smooth floor and may be taken as a minimum value for ordinary conditions. A moderate increase in the roughness of the floor increased the value of  $k$  5 per cent, and in an entry with much spilled coal or roof dribblings on the floor a 10-per cent increase may be assumed which would make  $k = 0.000,000,004$ .

It was also determined that a change in the velocity of the air caused a change in the value of the friction factor. As the velocity increases the value of  $k$  decreases but tends to become constant. The value given above is a fair average for velocities higher than 300 ft. per minute but as the velocity falls below 300 ft. per minute the value of  $k$  increases very rapidly. Thus at 150 ft. per minute the increase is 23 per cent and at 100 ft. per minute is 50 per cent of the value given for velocities above 300 ft. per minute. Thus at 100 ft. per minute the value of  $k$  would be between 0.000,000,005,4 and 0.000,000,006, depending on roughness.

### ALLOW 10 PER CENT FOR A CROOKED ENTRY

The effect of crookedness of the entry could not be investigated and the values given are for fairly straight entry. If the entry were so crooked that the survey center line would in some places be close to the rib, it appears probable that an increase in  $k$  up to 10 per cent would have to be allowed. On the whole a maximum value of  $k = 0.000,000,004,5$  appears to be reasonable for rough crooked entry with velocities above 300 ft. per minute.

Tests were made to determine the power consumed by eddy currents rotating in the cut-through dead ends. Board deflector brattices were placed across them flush with the rib of the entry and the resistance redetermined. Placing these brattices reduced the resistance of the entry about 6 per cent, the cut-throughs being located every 100 ft. Theoretically it takes less power to move the air in an entry if the cut-through dead ends are closed, but the money saving is so small that no special construction is justified. If there is much waste material to dispose of in driving the entry and a very high velocity air current will travel through it when finished, it may be worth while to gob the cut-throughs shut and plaster the front wall, but the erection of special deflectors cannot be justified.

The Pennsylvania bituminous mining law requires shelter holes at 15-yard intervals on entries having mechanical haulage. This condition could not be duplicated exactly in the experimental mine without the expenditure of much time and labor, but shelter holes were cut half-way between the cut-throughs making the distance between openings  $16\frac{2}{3}$  yards. The addition of these intermediate shelter holes did not cause any marked increase in the resistance of the entry. The shelter hole is only  $2\frac{1}{2}$  ft. deep and 4 ft. wide as compared with a cut-through dead end 20 ft. deep and 9 ft. wide. The power consumed by eddy currents in the smaller recess is negligible.

\*Chief of coal-mining investigations, mining engineer and assistant physicist, respectively, U. S. Bureau of Mines.





## News Of the Industry



### Explosion at Mine of Kemmerer Coal Co., Sublet, Wyo., Kills Thirty-Nine

On an "idle" day, between 11 and 12 a.m., Sept. 16, the Sublet or No. 5 mine of the Kemmerer Coal Co., located seven miles north of Kemmerer, Wyo., blew up, killing thirty-nine men out of the fifty-one who were working in the mine. Had the plant been actually in full operation about two hundred men would have been at work and possibly killed. The explosion is declared to have been severe. However, twelve men came out alive, emerging from the wreckage at about 5:30 p.m. The rest perished, the bodies being badly burned. On Sept. 23 the bodies of ten men had not yet been found, the quest having been blocked by falls.

The twelve men that escaped probably were saved from suffocation by the blocking of the airways due to caving. Part of the force was in a man trip going out of the main slope when the explosion occurred. Most of the bodies of these men were still in the cars when the rescuers reached the spot.

#### Mine Entrance Caved In

The explosion took place during a heavy rainstorm. It caved in the entrance of the mine and caused so much damage at that point that no rescue crews entered till 1:30 p.m. Apparently the damage in the mine was severe, as the removal of the bodies was accomplished slowly.

The force of the blast completely wrecked a long housing over the portal of the mine, which is a slope.

P. J. Quealy, the aged head of the company, was early on the scene and directed the rescue operations. Rescue-men were brought in from Rock Springs and Hanna. Sublet No. 5 has not had an explosion since 1881, but the Frontier Mine of the company blew up Aug. 4, 1923, killing 78 out of 94 men in the mine at the time.

The mine, strange to say, is quite wet, water being pumped from it regularly. It lies in the Cumberland basin, the seam dipping about 20 deg. and more steeply than the inclosing hills. It appears that much of the water that forms in the valley finds its way into the mines, perfect floods appearing at times when the static pressure with increasing depth causes a rupture in the reservoirs which the Cretaceous measures contain.

Some years ago the coal was being worked where it outcropped on the hills. The coal was dropped from this point down almost to the railroad level.

After a while, when the workings had extended far down the dip, it appeared ridiculous to be hoisting coal up such a height only to lower it again to about the same level. The bed being buried at tippie level a rock entry was driven to intersect it and thus cut off the unnecessary travel. At that time the company was operating a slow-speed fan but after the rock tunnel was driven a high-speed fan was installed.

In order to protect the miners, as the mine made gas, though not in large quantities, electric cap lamps were used exclusively. Spray lines were run within a short distance of all working faces. A hose extended these pipes to the loading point. Some men—perhaps two—were deputed to spend their whole time sprinkling the mine. Permissible explosives were used exclusively. The company had a good safety organization and had oxygen breathing apparatus.

The coal is a high quality bituminous with about 35 per cent volatile matter.

It appears that the source of the explosion was No. 12 entry but its actual cause is not yet known. The company believes it must have been personal carelessness, for the ventilation was excellent and all safety precautions had been taken. It will be remembered that the explosion at the Frontier mine was due to a fireboss opening a lamp to re-light it in a place where gas was present.

#### 46-Days' Coal in Storage, Say Purchasing Agents

The Fuel Committee of the National Association of Purchasing Agents estimates stocks of anthracite and bituminous coal in the hands of commercial consumers on Sept. 1 at 51,325,000 net tons. This is a decrease of 12,178,000 net tons when compared with the stocks on hand on May 1.

The report states that business as a whole shows an increase of 11 per cent for the month of August as compared with July and that the indications are for a continued slow but steady gain. It is estimated that industrial consumers had in their bins on Sept. 1 sufficient coal to meet requirements for 46 days. Consumers are advised that it would be well to place coal in storage now, coal prices remaining about the same as last month.

#### \$27,940,000 in Equipment For N. Y. Central Lines

New York Central, the Michigan Central and the Cleveland, Cincinnati, Chicago & St. Louis railroads on Sept. 16 asked authority from the Interstate Commerce Commission to issue \$20,955,000 of 4½ per cent equipment trust certificates. The proceeds would be used to purchase 4,100 coal cars, 3,200 box cars and other equipment, the total cost of which would be \$27,940,000.

#### West Kentucky Mine Signs Up At Union Scale

The coal mining interests of western Kentucky say they cannot understand what actuated the Phoenix Coal Corporation, at Drakesboro, Ky., in breaking away from the operators and signing the Jacksonville agreement with District 23, United Mine Workers. This was the first mine to accept the agreement—and the only one thus far. The plant is a large one, employing about 250 men. It is a comparatively new mining plant, having been established about seven years ago.

It is difficult to see how the union can figure that it has won a victory, in view of the fact that the mine probably can operate only on a temporary basis, under the 1919 wage scale with screenings at 90c.@\$1.10, and prepared at \$2.25@\$2.75, with some coal quoted as high as \$3. The company evidently is gambling on a stiff increase in the market in spite of the facts that the field is full of big stripping plants and non-union mines, which can produce far more coal than the normal production of the district and at far under the union production cost.

#### Five Miners Entombed by Explosion at Utah Mine

An explosion at the Rains Mine of the Carbon Fuel Co., near Castlegate, Utah, at 6 p.m., Sept. 21, entombed five miners. Rescue crews were working frantically the next morning to reach the imprisoned men. The mine did not take fire, as reported in earlier dispatches, and progress was being made in clearing away debris.

Mine company officials said that while a check showed only five men were at work cutting and blasting when the explosion occurred, it is possible there were others. Normally the mine employs about 200 men, but the work crews were off shift at the time.



Officials Confer on Status  
Of Trade Associations

Efforts to bring about a clearer definition of the legality of trade-association activities were initiated at a series of conferences held in Washington Sept. 22 by a special committee of the Chamber of Commerce of the United States with the Federal Trade Commission, Secretary Hoover and Attorney General Stone.

The committee, headed by Richard F. Grant, president of the National Chamber, laid before the government officials the results of a recent referendum reflecting the overwhelming opinion of business organizations that trade organizations perform a valuable public service and should be maintained. Arguments in support of this position were submitted, and the basis laid for a further conference to be held next month, when some statement of the government's attitude may be made.

The members of the committee accompanying Mr. Grant were Milton E. Marcuse, president of the Bedford Pulp & Paper Co., Richmond; George Publee, Washington; Alfred Reeves, general manager of the National Automobile Chamber of Commerce, and Elliot H. Goodwin, resident vice-president of the U. S. Chamber of Commerce.

Mr. Grant said after the conferences: "We are so much concerned over the question whether present trade associations fall within the scope of existing laws as in having a clear understanding of the proper function of trade-association activities. The special committee of the National Chamber formulated a series of resolutions with that in mind, and the overwhelming vote of the business of the country was in favor of its recommendations. We have made a careful search of the bills filed and decrees entered by the courts in cases relating to trade-association activities, and it is our belief that the activities proposed in these resolutions are entirely within the law.

"Apprehension has arisen among trade associations, of which more than 300 are members of the Chamber of Commerce of the United States, that all associational activities come under the ban, and some are afraid that mere membership might be the occasion for prosecution."

Know Any Bright Mules?

The most intelligent mine mule that Dwight Wilcox, superintendent for the Superior Coal Co., Gillespie, Ill., ever heard of was one which a driver in his own employ showed him. The driver was doing the gathering for seven working places and the mule had made just one round of the seven places when Wilcox came along.

"Betcha that mule can make the next round by itself," challenged the driver.

"Don't be so funny," scoffed the superintendent.

But the mule did the trick, delivering its seven empties and picking up its seven loads without a word or a touch from the driver, who merely followed along and hooked and unhooked the chain. So Wilcox was convinced.

And now who knows a more intelligent mine mule?

May Reduce Rates from Illinois  
To Anderson, Ind.

Rates for shipping coal from Illinois mines to Anderson, Ind., alleged to be exorbitantly high, may be reduced as the result of a hearing by E. L. Gaddess, of Washington, an examiner for the Interstate Commerce Commission. The case at issue was that in which the city lighting plant asked a refund of \$249 from the Big Four and Illinois Central railroads for alleged unfair rates charged for shipping coal to Anderson from Marissa, Ill. F. D. Roberts presented the case in behalf of the city. The City of Anderson alleges that the unfair rate cost \$246 on five carloads of coal, and in the petition the Interstate Commerce Commission is asked to allot the city that refund. Representatives of the railroad companies were in the city. A decision is expected in a few months.

Mr. Roberts says that the Interstate Commerce Commission will make a ruling soon in the case involving rates for West Virginia coal, in which it is alleged that Indianapolis gets a 35c. lower rate per ton than Anderson.

New Colonial Colliery Co.  
Absorbs Madeira, Natalie  
And Greenough Operations

Special to Coal Age

Scranton, Pa., Sept. 23.—With independent anthracite companies it is now practically a case of one merger after another. Following the announcement of the consolidation of the Temple Coal Co. and the East Bear Ridge company into the new Temple Anthracite Coal Co. came word of a practical completion of a merger of the Von Storch Collieries Co., the Legitts Creek Colliery and the West Ridge colliery by a group headed by former Governor William C. Sproul.

Now a third merger of anthracite companies has been completed. In the latest consolidation Madeira, Hill & Co. has taken over and merged the Madeira colliery and property in Plains, (Luzerne County), Pa., the Natalie colliery and property, the Greenough colliery and property, and 209 acres of coal lands located between them, known as the Hickory Swamp basin, all near Mt. Carmel, Northumberland County, Pa.

It is estimated that the combined output of all these operations will be 750,000 tons of coal a year. R. V. Norris & Son, of Wilkes-Barre, well-known mining engineers, have completed an exhaustive survey of all properties involved and report that the lands contain over 30,000,000 tons of coal available for market.

The new consolidation is known as the Colonial Colliery Co. and is incorporated under the laws of Pennsylvania. The main offices of the company will be in Philadelphia.

It is expected that the new company, under new management, and with a new breaker to prepare coal from the workings served by the Greenough and Natalie mines and also the coal from the tract of land lying between them will greatly exceed the earning power of the collieries operating separately. The new breaker will be called the Colonial colliery breaker and will be constructed of steel and concrete. It will have a daily capacity of 2,500 tons. The total cost of the new breaker, plant and development will be over \$1,300,000, it is stated.

Output and Value of Coal from Colorado Mines in 1923

(Compiled by U. S. Geological Survey)										
County	Loaded at mines for shipment (net tons)	Sold to local trade and used by employees (net tons)	Used at mines for steam and heat (net tons)	Made into coke at mines (net tons)	Total quantity (net tons)	Total value	Average value per ton	Number of Miners, a	Number of employees, All others	Average number of days worked
Archuleta, Moffat, Montezuma, Montrose and Pitkin.....	2,091	9,939	100	.....	12,130	\$38,000	\$3.22	21	3	27
Boulder.....	556,035	36,149	35,818	.....	628,002	1,690,000	2.69	538	224	126
Delta.....	79,966	27,239	395	.....	107,600	342,000	3.18	70	16	27
Elbert and Jefferson.....	140,514	6,783	9,490	.....	156,787	346,000	2.21	106	53	28
El Paso.....	196,438	147,030	12,115	.....	355,583	1,030,000	2.90	234	86	55
Fremont.....	526,335	80,670	6,458	.....	613,463	2,658,000	4.33	649	284	158
Garfield.....	202	22,138	.....	.....	22,340	80,000	3.54	31	4	2
Gunnison.....	509,659	7,409	25,924	.....	542,992	1,835,000	3.38	363	137	153
Huerfano.....	1,928,472	20,727	16,218	.....	1,965,417	7,319,000	3.72	1,442	571	452
Jackson.....	55,500	1,660	100	.....	57,260	121,000	2.11	46	11	19
La Plata.....	68,577	27,860	28	14,292	110,757	341,000	3.08	99	30	16
Las Animas.....	2,900,287	57,477	55,995	175,743	3,189,502	10,245,000	3.21	2,797	956	653
Mesa.....	148,344	30,025	2,205	.....	180,574	510,000	2.82	188	55	37
Rio Blanco.....	.....	3,706	.....	.....	3,706	13,000	3.78	5	1	.....
Routt.....	745,508	16,099	41,848	.....	803,455	3,120,000	3.88	592	218	248
Weld.....	1,512,976	39,553	24,901	.....	1,577,430	3,555,000	2.25	883	465	185
Total, excluding wagon mines..	9,370,904	534,464	231,595	190,035	10,326,998	33,243,000	3.22	8,064	3,114	2,162
Wagon mines served by rail....	19,220	.....	.....	.....	19,220	56,000	2.92	.....	.....	.....
Grand Total.....	9,390,124	534,464	231,595	190,035	10,346,218	33,399,000	3.22	.....	.....	.....

a Includes also loaders and shotfirers.



## Colorado Producers See Good Prospects for Fall

Colorado coal operators are discouraged. The consensus among them after the poorest summer on record, was that immediately after September a real pick-up in business is coming and that the winter is going to see a heavy and reasonably profitable movement of Colorado coal in all the markets it normally reaches.

Buying has been abnormally slow all summer for three main reasons, they say. The farmers in the Colorado coal market territory, comprising the states of Colorado, Nebraska, Kansas, Oklahoma and Texas, have been in a state of financial collapse. There has been further a feeling that prices were going to remain low. A third cause of delayed buying has been a desire to wait till the Interstate Commerce Commission reports a reduction in the Missouri River rates. The sudden realization that wheat in all those states is a bumper crop and is moving at a good price, and the cheerful indications of an oncoming bumper crop of corn have pretty well relieved the farmer of his pauperism. The days of violent price cutting appears to be definitely over, for price cuts during the summer brought no business at all. It is definitely known that another increase following the 25c. boost in August will be made in September. And there is no indication that the I. C. C. is going to announce its decision in the Missouri River case until late fall or winter.

### May Fix Rates on Mileage Basis

The feeling is general in Colorado that the country is going to get a shock when the commission hands down its Missouri River decision. It will not surprise Colorado to see the commission wipe out the present rate-making basis and adopt straight mileage as the basis for all coal rates. This was stoutly advocated before the commission by Harry F. Nash, of the Oakdale and Alamo coal companies, at the time of the hearings more than a year ago, and since then some others have come to share his feelings in the justice of such a basis. If the commission does adopt it, the rate structure covering a wide section of the United States would have to be adjusted to conform.

Western railroads never have been in better shape to handle traffic, even the Moffat road, hauling Routt County's 800,000 tons of coal, claiming to have remedied some of the physical defects which too often have made it impotent just at the times when coal needs to

## Coal Company Sells Fruit As Side Line

The unusual spectacle of fruit being retailed in a coal office can be seen in St. John, N. B. J. S. Gibbon & Co., dealers in hard and soft coal and former operators of a pit in the Grand Lake bituminous mining region, have entered the new business on a wide scale. The store formerly devoted to receiving coal orders and displays of different types and grades of hard and soft coal now is partly filled with domestic and imported fruit of all kinds. Outside the store, boxes of fruit are on display, with the prices attached. What started this firm in the new line was the purchase by J. S. Gibbon, senior member of the firm, of an orange and grapefruit grove in Florida. After disposing of the fruit from his own property, Mr. Gibbon started selling fruit in general in his coal office. J. S. Gibbon & Co. have been in the coal business in St. John for more than twenty years. During the slack coal season of the summer period, the fruit side line proved effective.

move. It is cited by an operator that Colorado's running time during the coal year 1923-4 averaged higher than that of several other Western states, partly because there has been less recent overdevelopment in Colorado. One important mine, Alamo, near Walsenburg, has been opened during the year but that is all. However, there are now two more new mines in immediate prospect. This indicates the confidence that certain Colorado operators have in the immediate future.

Oil is growing as a coal competitor, especially because of the recent strike in Routt and Moffat Counties. At present, however, oil has little if any advantage in price. This relationship probably will continue unless the Routt County oil dome turns out to be a tremendous producer. More than one coal company with retail branches is seriously considering the advisability of selling both oil and coal, so that if customers insist upon oil the coal man will not be a dead loser by it.

Coal has not been dealt any death blow in Colorado as is evidenced by the fact that the salesmen when hard after the machinery and equipment business during the past spring and summer found ready returns for their labors.

## Wilton Lignite Mine Reopens On Non-Union Basis

The Washburn Lignite Coal Co. has reopened its mine at Wilton, N. D., on a non-union basis, after having operated for the past six years under the union scale of the United Mine Workers. The mine was practically the only lignite mine operating on union basis the past year.

When the old union contract expired on March 31, the operators of the Wilton mine shut down their plant for the summer and did not sign the new contract.

The company stated that it could not meet the competition of a large number of mines which sprang up in the last two years, operating on a non-union basis at much lower wages than the union scale. The Washburn company offered a scale conforming to the wages now being paid by many of the bituminous mines in the East.

The proposed scale ranges from \$4.50 to \$5.50 per day for most company men, according to the company statement, with a separate scale for miners operating on a tonnage basis.

The union voted against the men returning to work on a non-union basis.

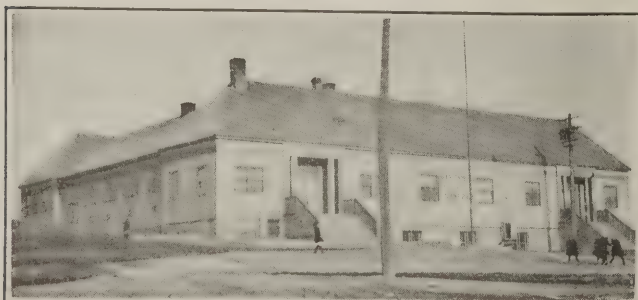
It is asserted by the company heads that many outside men are willing to go to work at the present wages, but that outside men will not be hired until the old employees have definitely settled their course.

The new scale of wages is as follows:

Pillar coal, per ton.....	\$3.85
Entry coal, per ton.....	.73
Room coal, per ton.....	.62
Cutting, per ton.....	.11
Slack, per car.....	.50
(NOTE—wage earned on per ton basis would range from \$7 to \$10 per day.)	
Drivers, per ton.....	\$0.04
or per day.....	5.00
Cagers, per day.....	5.50
Bottomshaft, per day.....	5.00
Motor men, per day.....	5.50
Trip riders, per day.....	5.00
Trappers, per day.....	3.50
Screen man, per day.....	5.00
Box-car loader men, per day.....	5.00
Other top men, per day.....	4.50
Head track man, per day.....	5.50
Track men helpers, per day.....	5.00
Head timber man, per day.....	5.50
Timber men helpers, per day.....	5.00
Pipe man, per day.....	5.50
Pumpers, per day.....	5.00
Head blacksmith, per day.....	5.00
Blacksmith helpers, per day.....	4.50
Carpenters, per day.....	5.00
Hoist engineer, per month.....	135.00
Barn boss, per month.....	125.00
Power-house engineers and firemen, per day.....	4.50
Boiler washer, per day.....	5.00
Section men, per day.....	3.50

## L. & N. Handles 8 per Cent Of Country's Coal Tonnage

The Louisville & Nashville R.R., in a recent statement, reported that in 1923 a total of over a half million cars of coal, or 8 per cent of the soft coal mined in the United States, was transported over its lines. The road with 5,038 miles of track, as compared with 251,175 miles of track in the United States, has 2 per cent of the total trackage, as against 8 per cent of the total coal tonnage, and demonstrates the importance of the road as a coal carrier. The tonnage handled comes from mines in Tennessee, Kentucky, Virginia, Alabama and Illinois.



### Recreation Hall For Miners and Their Families

In the mining town of Hanna, Wyo., belonging to the Union Pacific Coal Co. Hanna is devoted entirely to the mining of coal.



## British Marketing Methods Preserve Stable Relations Throughout Trade

Respect for Contract Obligations Marks Dealings of Producers, Middlemen and Consumers—Coal Exchanges Play Important Part—Advantage of Such Institutions Here Debated

BY PAUL WOOTON

Washington Correspondent of *Coal Age*

Because the British have been conspicuously successful in the marketing of coal, it was this aspect of the British industry to which the American coal men attending the World Power Conference, at London, paid most attention in their tours and studies, which the British facilitated in every way. Napoleon referred to Great Britain as a nation of shopkeepers. If "shopkeepers" be changed to "merchants" the British are glad to have the thought kept alive.

Marketing is the least explored field of our industry. For that reason the American observers regarded a study of British methods well worth while. They were much impressed with the stability of the relationships between producers, middlemen and consumers. The obligations of contracts are held in the highest respect. There is no complaint there that a coal contract means nothing.

The British contracts always contain a strike clause, but there is no provision as to free coal. Since car shortages are practically unknown in Great Britain, this prolific source of trouble in this country is not present there. A British mine can count on producing its normal output so long as there is no strike. In cases where the shipper is unable to supply the quota in one month, definite provision is made for releasing him from the obligation or for making up the deficit in a specified manner. The higher standing of the British contract is explained in part by the fact that they have no wagon mines and, in fact, few mines with an annual capacity of less than 50,000 tons. This means that all the producers are men of substance. Even allowing for that, all the American observers agree that business honor in Great Britain is on a very high plane.

### Exchange a Steadying Influence

One of the things which contributes to the maintenance of the settled relationships in the British trade and the high standard of honor is declared to be the coal exchange. There are some fifteen such exchanges in the principal cities of the British Isles. That at Cardiff is typical. Through this exchange and similar ones at other South Wales ports, arrangements are made for the marketing of the 50,000,000 tons which are produced annually in this section. The floor of the exchange is a busy place for two or three hours at the middle of the day.

Representatives of the producers, the middlemen, the shipowners, the insurance companies, and in fact, all having anything to do with the coal trade initiate most of their transactions

through personal contact on the floor of the exchange. It is not unusual for an exporter to receive an order from abroad, arrange the purchase of the coal, procure the vessel and arrange the insurance all within an hour, without leaving the floor of the exchange.

The larger exporting firms have their own docks. Their foremen call at the exchange each morning and are given instructions as to the loading of ships. There is no posting of sales with tonnage and prices, and no preliminary investigation of an applicant for membership. Membership on the exchange can be maintained only, however, by the strict observance of its traditions of square dealing. The Americans were convinced, however, that the personal contacts at the exchange are an important element in building up a high standard of business honor.

### Verbal Promises Are Always Kept

Agreements made verbally on the floor of the exchange are leisurely confirmed later by letter, but over a period of many years there has been no instance when a member has failed to keep his verbal promise, regardless of price changes that may have resulted before he committed himself in writing. While there is no blackboard in the exchange, the representatives of the trade papers are admitted to the floor and base their bulletins of prices on the transactions which are made on the floor.

Observers from the United States are convinced that these exchanges contribute to a more prompt handling of business than would be possible without them and that they contribute in an important degree toward the stable relationships and square dealing which characterize all factors in the coal trade in Great Britain. There is frank recognition that each factor needs the other and the veiled hostility which so frequently characterizes the relationships between American producers, wholesalers, retailers and the transportation agencies is entirely lacking.

There is much difference of opinion, even among the Americans who have visited the British exchanges, as to whether or not this institution could be used to advantage in this country. There is no one place in this country which can be compared to Cardiff, where so large a portion of the output of the tributary region flows through one channel. Norfolk and Cleveland are the only points where conditions are at all similar. In the coal fields tributary to those two points, only a part of the production is water borne. A very considerable portion of the output moves by rail from hundreds of mines to thousands of destinations. This greatly reduces the advantages of

## Best Wages and Conditions In America, Says Kennedy

Special to *Coal Age*

Scranton, Pa., Sept. 23.—The highest wages and the best working conditions in coal mines are found in America, Thomas Kennedy, president of District 7, United Mine Workers, recently declared upon his return from a tour of Europe. Accompanied by James A. Gorman, secretary of the Anthracite Conciliation Board, he visited Europe as one of the delegates from the organization to the International Mining Congress at Prague, Czechoslovakia. Mr. Kennedy is now attending sessions of the biennial convention of the miners of the Lehigh field at Freeland. Neither he nor his staff, except members of the district executive board, had opposition for another two-year term at the election held recently. During Mr. Kennedy's absence, Andrew Matti, veteran vice-president of the district, was in charge of affairs. Matti is the oldest official of the United Mine Workers in the anthracite field, having taken office soon after the men were organized by the late John Mitchell.

the coal exchange, even at those unusually favored points.

At the same time the coal exchanges at interior points, such as London and Sheffield, seem to possess great vitality, despite the fact that they are not the active institutions as are the exchanges at Cardiff and Newcastle. Much of the business at those points is conducted, as it is here, by telephone, by mail or by personal solicitation, yet the exchange apparently performs a valuable function in addition and some think that the plan is well worth trying at such points as Pittsburgh, Columbus and St. Louis.

## Shirkie Denies There's Foul Air in His Mine

Hugh Shirkie, owner of the Shirkie mine at Shirkieville, Ind., which is idle because of a strike of the miners employed there, stated that the miners' allegations of foul air and no roads are without foundation and that in support of his statement he has the official statement of the mine inspector.

In a resolution the 500 miners gave as their reasons for refusing to work that foul air in the mine had resulted in one death and serious sickness to another miner, and that the company had failed to provide proper tracking, causing 90 per cent of the miners to have to shovel their coal several times before finally reaching the mine car with it.

The resolution stated that J. W. Davis, a negro, died at the top of the mine on Aug. 19, after coming out of the mine, because of foul air, and that on the following day 65 miners were forced to abandon work because of foul air in the mine.





## Problems In Underground Management

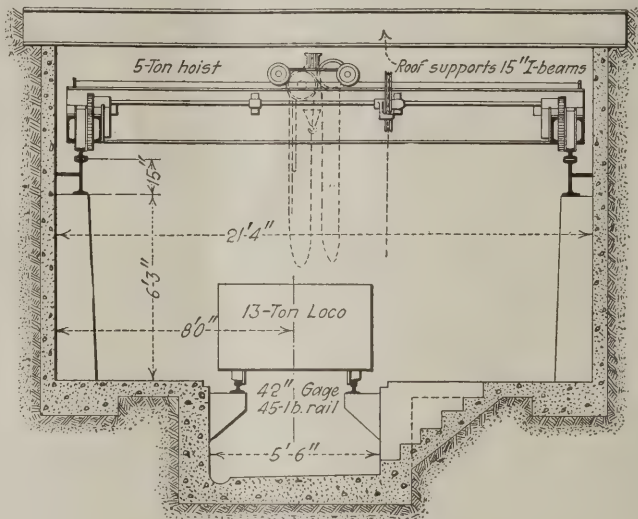


### Underground Locomotive Barn at Kramer Both Capacious and Convenient

**T**HE ultimate economy of commodious and well constructed quarters for the storage and repair of mine locomotives is now quite generally recognized. The problems involved—and indeed, they are not easily solved—are most vital. Time was when a structure of this sort was viewed as a luxury, but no longer is this true, for the motor barn is now a primary part of a mine operation.

The satisfactory location of an inside locomotive barn and the arrangement of the stalls and track, not to mention the coursing of the ventilating current through the barn and the layout of the repair pit, call for careful study and the revision of many details before actual construction commences. The plan of the motor barn of the Northwestern Mining & Exchange Co., Du Bois, Pa., for its new Kramer mine—daily capacity 4,000 tons—is suggestive of possibilities in such construction.

This barn is to be located 600 ft. from the auxiliary shaft. The first stall looking inbye, is the largest and is provided with a pit and such equipment as will be required for making minor repairs to locomotives. The second stall is planned for the unloading of supplies from mine cars into a wide crosscut at the rear of and joining the



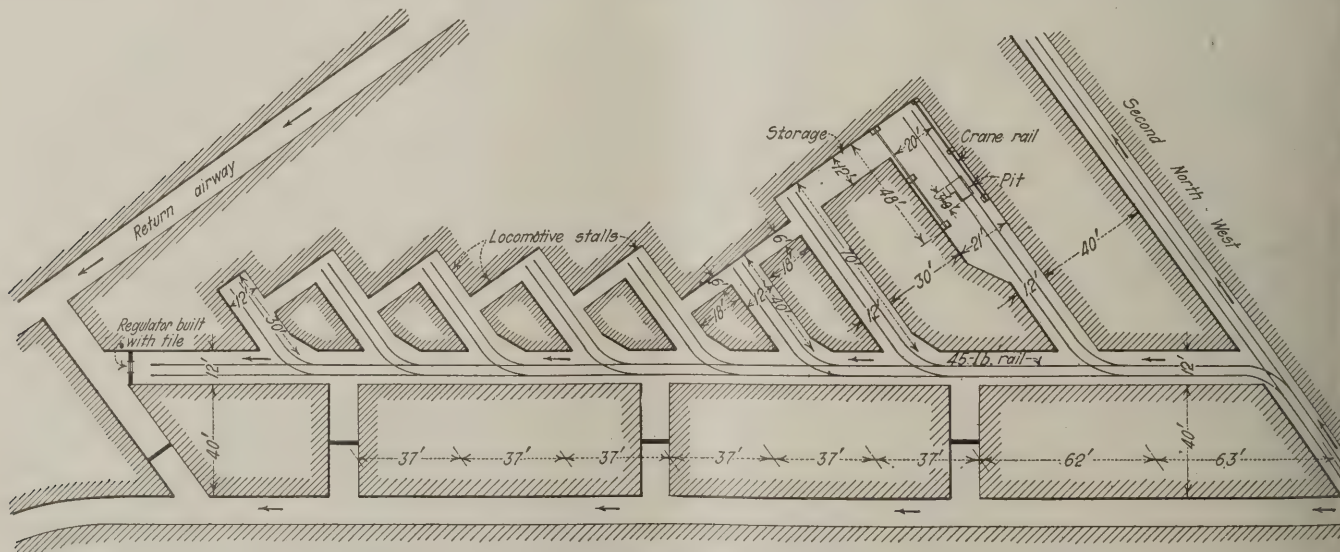
#### Cross-Section of Repair Pits

The mine rail is supported over the repair pit by shelf brackets. By this means the width of the pit is not limited as it would be if the rails rested directly on the tops of the walls on either side of the pit, nor do the rail supports hamper the work of the electrician.

first and second stalls. This provision obviates the need for storing supplies and materials where they interfere with the workmen. All other stalls are to be used for the storage of locomotives; each will accommodate three 13-ton units, except the last, which has room for only two locomotives of this size.

Crosscuts are to be made from stall to stall to facilitate ventilation. It

tially built of concrete and steel. Attention is called to the most important features—namely, the crane and the pit. To provide facilities for lifting parts in any part of the stall, a 5-ton crane of the trolley type will be provided. The track by which it is supported is strong enough to sustain the weight of one end of a 13-ton locomotive when it is necessary to tilt the machine so as to facilitate the removal of



#### Underground Locomotive Barn at 4,000-Ton Mine Provided with Several Stalls

Each stall except the last holds three 13-ton locomotives. The end one has capacity for two only. The first, or outbye, stall has a repair pit and equipment for

making minor repairs. The second stall is used for the unloading of repair supplies from mine cars. The arrows indicate the direction of the air current by which the

barn is ventilated, provision being made for throttling the ventilation should it at any time prove excessive, especially in the winter months.



wheels or tires. The crane track, which is supported by 15-in. I-beams running lengthwise of the repair stall, is 48 ft. long, each track resting on two 24-ft. lengths of I-beam, which in turn rest on three concrete columns, the joint between them being supported by the center column.

The locomotive track rails over the pit rest on shelf blocks. Thus working space is provided under and around the tracks. The stairway, which is of concrete, enters at the side of the track. Consequently it in no way reduces the available operating space. In these two ways the electrician in making his repairs finds his movements and efforts unhampered.

## Passing of Mine Bosses' Underground Shanty

By C. E. REYNOLDS

Superintendent, Allegheny Pittsburgh Coal Co., Logan's Ferry, Pa.

Underground mine bosses should meet several times each working day to compare notes and talk over the work of the day. An office of some sort is usually provided in the mine for this purpose. More often than not it is nothing more than an enlarged manhole in the coal, which is sometimes boarded off from the entry on which it faces and is entered through a flimsy door; it may or may not have a window. Because of its crude construction and make-shift appearance, it is generally termed the "bosses' shanty." But times change. The company office of prior years was crude compared with that of today, and underground offices doubtless will share in the general advance.

In the Springdale mine of the Allegheny Pittsburgh Coal Co., not far from Pittsburgh, a fireproof office of concrete and steel is being completed that has the appearance of a carefully planned outside building. It was built with the purpose of making office hours pleasant for the bosses, thereby insuring greater efficiency from them. An interior view of this office is exhibited in the accompanying illustration. The

wires attached to the two-by-four in the left-hand corner are temporary.

This office is located in a break-through between the manway and the main haulage road. At each end is placed a door to give easy access to, and to give a good view of, each entry and in each of the endwalls is a port-hole that sets up a ventilating current of air in the office. Conveniences in the form of an electric stove and built-in clothes lockers are furnished. The company plans later to conduct from the outside drinking water and hot water for washing to a point on the manway outside the door of the office. At this station also it intends to install latrines that will be discharged into a sewer line leading to the main sump which has a storage capacity of over 2,000,000 gal. of water.

## British Make New Rules for Safety in Shotfiring

The British Secretary of Mines has issued an order, to become operative on Oct. 1, governing the firing of shots in coal mines where danger may arise from firedamp or coal dust. The new regulation stipulates that no person may be newly appointed to fire shots unless he possess the prescribed qualifications as regards age and practical experience underground, and that no person may be appointed whose wages depend upon the mineral to be gained.

The examination for gas, which has to be made by the shotfirer immediately before the firing of each shot, is to include examination for any gas issuing from the shothole itself and from any break within 20 yd. Shotfiring is specifically prohibited within 20 yd. of cavities and breaks that are not accessible to examination for gas issuing from them or contained in them.

Every place where a shot is to be fired is to be treated thoroughly with stone dust or water unless the firer is given written permission by the manager to dispense with this precaution. Where two shotholes are close enough together to make it possible for the firing of one shot to relieve the work

to be done by the other, the first shot must be fired before the second hole is charged, the object being to guard against the second hole being overcharged, as might be the case if it were charged before the first shot were fired, leaving the firer in doubt as to the work to be done by the second shot. An exception with limitations is made to this provision in respect to shots to bring down the coal in longwall faces, subject, however, to the condition that the shots are fired between shifts.

## Wetted Handkerchief Useless As Breathing Apparatus

According to A. T. Winborn, in the *Ebbw Valley Works Magazine*, mine workers in South Wales are being taught to use a handkerchief as a respirator in mine-rescue work and, further, when examined at ambulance (first-aid) competitions they lost marks if they omitted to make reference to its use in emergencies.

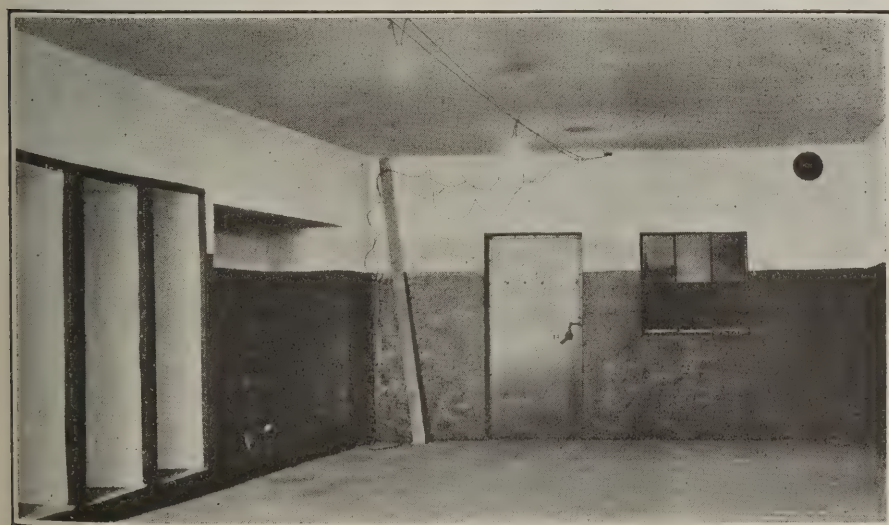
Mr. Winborn remarks that the only possible service a handkerchief might perform would be to filter air containing dust or smoke and thus lessen in some degree the irritation that is caused to the bronchial tubes and other air passages when air is breathed under these conditions. In the case of smoke, however, says Mr. Winborn, one would be well advised to use caution, as smoke is rarely unaccompanied by noxious gases which easily might overcome the man placing his full confidence in the handkerchief.

### HANDKERCHIEF FOR SELF-SUCCOR

In comment on Mr. Winborn's remarks it may be said that the use of a wetted or unwetted handkerchief in safety work is wholly inexcusable. The risk is too great. The handkerchief is no protection against carbon monoxide. It has its uses, however. Where the hazard has to be faced by a man caught in a mine after an explosion it is advisable to use a wetted handkerchief, which will screen out the smoke and dust in the air he breathes, which solid particles may well be poisonous. It is not to be forgotten that men have been poisoned cleaning out byproduct apparatus at coke-oven plants where carbon monoxide most probably was not present.

The smoke and dust may not be harmless, and it is well to screen it out. Probably carbon monoxide in lethal doses will be present. If it is, the handkerchief is no protection except as it hampers respiration and so lengthens a little the time in which the blood will become saturated. We do not know, furthermore, that there are no highly soluble gases that the water in the handkerchief may absorb.

The handkerchief has done excellent work apparently in some cases, but to use it in rescue operations is to take a chance that cannot be too strongly condemned. Those who are in the mine and face immediate death, however, would do ill not to use any method that might be of assistance, no matter how relatively ineffectual, and there is some reason to believe that to use a wetted handkerchief is better than to take no precaution against death.



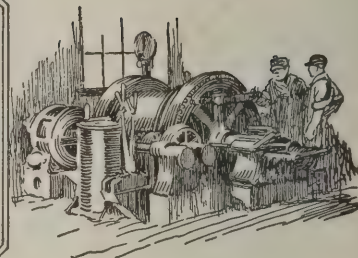
How Long Will Your Mine Run?

If for many years, it will pay to build a comfortable, spacious office underground, electrically lighted, cement faced, with lockers and other conveniences like this one at Springdale, Pa.





## Practical Pointers For Electrical And Mechanical Men



### Uses Electrically Heated Oven to Keep Equipment Dry

It is indeed unusual to find a repair shop so well equipped as that at the Orient No. 2 Mine of the Chicago, Wilmington & Franklin Coal Co., near West Frankfort, Ill.

Like many other parts of the plant the electrical repair shop shows evidence of a tendency to break away from customary mine practice. An interesting feature of this shop is the automatic electrically-heated baking oven. This heater is used for drying electrical apparatus after or in process of repair, and it may be used to dry electrical insulation, which, for instance, has become wet by being splashed in water

as to what could be done. He had undergone such disagreeable experiences before. Perhaps he could smooth the ring a little with a block of stone and continue to put in new brushes to replace those being rapidly worn out. In this way he might postpone permanent repairs until Sunday, but at a considerable cost in brushes, labor, anxiety and wear to the collector ring.

Suddenly a new idea came to him. What would happen if he would remove all the brushes that bore on the bad ring. After an hour's thought and study he was thoroughly convinced that, in view of the light load on the

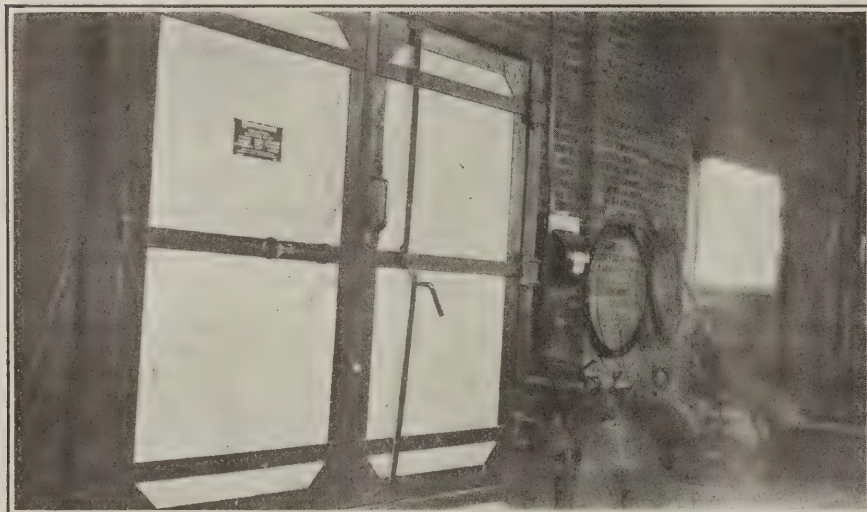
six-ring converter, the machine may sometimes refuse to start from a standstill. However, by turning the armature to another position and then closing the alternating-current starting switch, the machine would start without hesitation.

### Let Repairmen Know What Replacements Cost

Typical of the progressiveness of the Mallory Coal Co., of Logan County, West Virginia, is the method used in handling the mechanical and electrical repair parts. Upon stepping into the warehouse a display of white tags catch the eye. These tags are tacked below each of the well-arranged wooden bins and tied to the larger and heavier parts that are stored in orderly fashion on the floor.

An examination of these tags reveals that in addition to the usual information regarding catalog number, order number, and description, the unit cost price is given in plain figures, for any one to read. By this method the chief electrician and others taking out repair parts are informed as to the cost. As this class of parts usually costs considerably more than the repair men realize, the system has the effect of making the conscientious man hesitate before using a new part, and often induces him to put back into service an old part which by a little ingenuity and work can be made to serve as well as the new.

The company may have other reasons for noting the cost prices on the tags. Whatever these may be it is apparent that the practice does not add an appreciable extra burden of clerical work. The receiving, accounting and dispensing of supplies is handled with a surprisingly small expenditure of labor.



**Electric Baking Oven with Automatic Heat Control**

Electrical apparatus which must be held as spare equipment often absorbs moisture from the air and when most needed proves to be unserviceable. This oven can be regulated to maintain any desired temperature. It would be a valuable acquisition to any mine-supply or repair shop.

or has been idle and, in consequence, has absorbed moisture. Devices for the automatic control of the oven maintain a constant temperature or shut off the heat at any predetermined time.

### Removes Arcing Brushes and Runs Without Them

The alternating-current brushes in one holder of a six-ring, 300-kw., 275-volt converter began to flash indicating a burned spot on that particular collector ring. Although the average day load was not over 150 kw. this ring was rapidly getting in worse condition. It was inconvenient to stop the converter for repairs before the next Sunday. The mine electrician was puzzled

converter, this was the only reasonable way to meet the difficulty. A trial proved his judgment correct. The machine carried the load until the next Sunday with no signs of distress. When Sunday came the ring was put into first-class condition by turning and grinding.

The method of "getting by" with removed brushes having proved successful, this mine electrician wondered what proportion of the full load could be carried under such a condition. From a reliable technical source he was informed that approximately 58 per cent of full-load rating could be safely carried by the converter. In addition he was informed, and it was later proved by trial, that when the brushes are lifted from one ring of a

### Purchased Expensive Lathes Without Due Thought

A company decided to buy several engine lathes, one for each repair shop. Someone suggested that these lathes should be large enough to turn the tires of the haulage locomotives. In the office a catalog was consulted showing the largest tires to be of 30-in. diameter. Lathes accommodating a 30-in. circle were purchased and installed, but when, several months later, an attempt was made to put an axle with wheel cores and tires assembled, into one of these lathes it was a shock to find that a 30-in. tire is of 30-in. diameter at the tread but considerably more over the flange. The lathes were useless for this important duty.

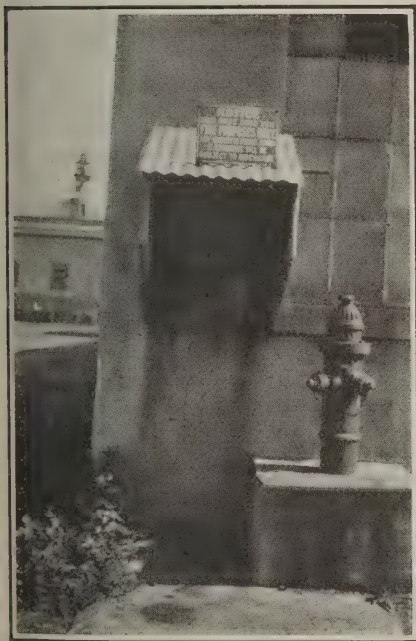


A similar case occurred with another company. One of the officials appropriated money for a new lathe. The management of this company also thought it advisable to get a lathe large enough to accommodate locomotive trucks. An expensive gap or double-bed type lathe was specified, the maximum gap opening to be 40 in., this being the gage of the locomotives. Soon after the installation an attempt was made to put a truck in the lathe, but the gap was not wide enough. Too late it came to the attention of the purchasing agent that a 40-in. gage truck measures more than 40 in. width over tires. The lathe has never been used as intended.

What is the lesson? Just who was at fault? We will not try to place the responsibility but suggest that had the practical mine mechanic or electrician been taken into confidence and consulted regarding the details of the lathe to be purchased, the errors would not have occurred.

## Plug and Hose Always Ready

Regardless of all the precautions which may be taken at a mine property to eliminate the possibility of a fire



Fire Hose Protected from Weather

So that the fabric will not become wet and rot and also to prevent the heat of the sun from injuring the rubber the fire hose is protected by a small slanting roof. The sides of the housing also support a reel upon which the hose is wound.

not a little hazard still exists. Buildings of concrete, stucco or steel make the mine yard quite safe; however, the very nature of some of the equipment and supplies which must be kept in the yard makes it imperative to have fire-fighting apparatus always available.

Fire plugs and reels of hose are located in several advantageous positions in the yard of Donk Bros. Coal and Coke Co. Thermal mine No. 4, near Edwardsville, Ill. The fire hose is always handy and to protect it from the weather is covered with a little housing as shown in the illustration. The hose is on a reel, so it can be run out readily.

## Hoisting Cables Should Be Lubricated Regularly

Most wire ropes used for hoisting purposes are constructed with a core of manila heavily saturated with a good lubricant. The strands of steel are wound around this core which acts as a cushion and holds the grease or lubricant in reserve. This does not, however, obviate the necessity for the subsequent use of a lubricant after the rope has been placed in service.

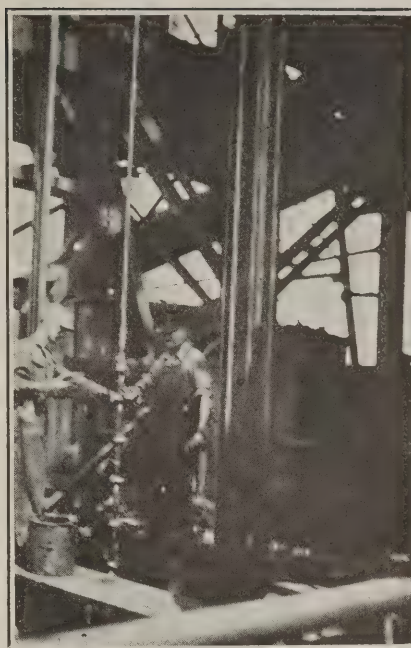
The illustration shows workmen at the J. K. Dering Coal Co. Mine, near Eldorado, Ill., lubricating the main hoist cable. The work is done periodically so as to insure proper service and long life from the rope.

The men are shown on a wooden platform laid across the shaft opening. After the attachments between the rope and cage are lubricated the cage is slowly lowered to the bottom of the shaft. The men on the platform meanwhile apply grease to the rope. Cloth gloves are used for this work so that the workmen will not injure their hands on any broken or damaged wires.

All this work must be done carefully because just below the men, under the temporary platform, is the gaping hole of the shaft. As grease may drop on the platform where the men might step and slip much care is taken. It must be remembered that with greasy gloves and no place on which to hang every precaution must be taken to avoid the possibility of an accident.

When planks are stretched across the shaft for this kind of work the ends should not extend over the opposite compartment, because when the cage in the compartment over which the men are working arrives near the bottom the other cage may come up and strike the ends of the planks and upset the men into the shaft.

Usually nearly all of a hoisting cable may be lubricated from some position near and over the ground. Often this may be done where the rope enters the hoist room or inside the building just where the rope passes onto the drum. Here the workmen are safer.



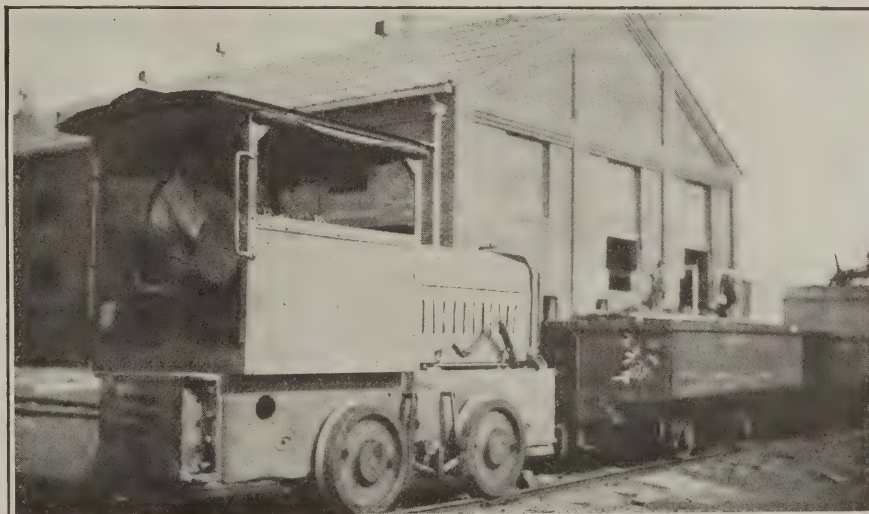
Greasing the Main Shaft Cable

Hoisting ropes must be lubricated frequently, but, as the work is dangerous, precaution must be taken so that the workmen may not be injured. These men are standing on a temporary platform.

## Gasoline Locomotive Hauls Cars Around Mine Yard

Not all the locomotives used at the mines are operated by electricity, steam or air. At the Orient No. 2 Mine of the Chicago, Wilmington and Franklin Coal Co., near West Frankfort, Ill., a gasoline locomotive is used to transport cars around the colliery yard.

It was chosen for this service because it was desired to keep the yard free from trolley wires. All the cables and wires around the buildings are buried. The power used in the shops and supplied to the large shaft hoist which incidentally is the largest in the coal-mining field, is furnished through underground cables laid in extensive conduits leading from a main transformer substation.



Gasoline Locomotive Obviates Need for Electric Wiring

Mine yards nowadays are being laid out so that every operation may be performed rapidly and with ease. Former generations delivered themselves of a similar "wheeze," but witness the gasoline locomotive used at Orient No. 2 Mine. As it eliminates trolley wires it makes it unnecessary for the top men to keep looking up to watch their heads. When they should be looking downward to watch their steps.



## Book Reviews

### Heating and Ventilating Engineers Fail to Sense Some Big Opportunities

Regret will be the principal sentiment of the coal producer who reads "The American Society of Heating and Ventilating Engineers' Guide, 1924-1925." The book contains so much of great value, is such a credit to the society that issues it that a coal producer cannot but be surprised that it overlooks in such a marked degree the two big needs of the heating and ventilating industry—the cooling of air and the use of small coal.

It is to be hoped that when the title is changed so as to read "1925-1926" the book will contain two new chapters on these subjects and will treat them with as much completeness and acumen as it does the others and that the advertising section will bear evidence that the heating and ventilating engineers have these two desiderata in mind. There is a chapter in the present book on refrigeration, but it deals with cooling not so much for human comfort as for the preservation of perishable products.

A chapter on "How Temperature, Humidity and Air Motion Affect Human Comfort" does get measurably nearer the subject. We are informed that "the cooling effect produced by the evaporation of water has been helpful in air conditioning, particularly when the air is quite dry." Unfortunately we want the air cooled most when it is most highly saturated, and so this statement gives a minimum of satisfaction. However, the value of air movement is stressed, but the breeze helps in no degree when the air is entirely saturated. It seems that comfort may be increased, but real comfort cannot be attained, through evaporation.

We think heating and ventilating engineers will some day arrive at the point where they will give us comfortable air under the most humid of conditions, not alone by air motion and evaporation of water but by actual cooling provisions.

As for the other deficiency in this book it is inexplicable. We look at the advertisements with a hope born of despair. Surely the boiler manufacturers, if not the heating and ventilating engineers, realize the importance and advantage of using fine coal, especially those exhibiting in the economy shows of the anthracite operators. A few do, apparently—in a degree.

The Brownell Co. says: "The Brownell Smokeless Boiler is designed and constructed to burn any kind of fuel economically and without smoke," but it says no more. The Abram Cox Stove Co. is a little more specific. It says: "The cheaper grades and sizes of hard coal are made to yield as many heat units as the larger and more expensive sizes. In the Novelty Carburetor Boiler there is a big saving in burning hard coal regardless of the size, as well as soft coal."

The International Heater Co. says: "The International Economy Smokeless Boiler is an updraft boiler designed to burn any fuel used for heating purpose, as soft coal, hard coal including buckwheat on large installations, coke and oil." "The Molby Boiler," says the Molby Boiler Co., "gives a steady, even heat over long periods with low-priced No. 1 Buckwheat anthracite."

The Spencer Heater Co. briefly claims that its boiler "burns small-size hard coal." Most of the advertisements say nothing whatever about coal size. The Combustion Specialties Corporation, manufacturer of the Combustio Draft System and an exhibitor in the anthracite economy shows, says nothing about the ability to burn small sizes.

We think the anthracite and bituminous operators should suggest to the manufacturers who make boilers which are able to burn small sizes that they stress that fact in their advertisements. We believe they should urge on the Heating and Ventilating Guide publishers that some statement be made in the text on the lower price and greater economy of the use of small sizes of coal. No subject is more important to consumer and producer than this of the possibility of reducing the size of coal burned. Missionary work is best done in guides, text books and publications that the architects and ventilating engineers read.

### Neglect Economy of Small Sizes

A word to publishers who may be expected to issue such books doubtless would suggest to them the advantage of their authors specifically calling attention to the economies in using smaller and less expensive coal, not with the design of inducing authors to introduce what they do not approve—if it be possible that they do not approve of the use of fine sizes—but so that a matter so vital shall not be overlooked. No book on heating is complete that does not emphasize this feature in modern practice.

The Guide contains 234 reading pages, 224 pages of catalogue advertising and 52 pages of the roll of membership in the society. It measures 6 x 9 in., is cloth bound, costs \$3 and is published annually by the society at 29 West 39th St., New York. To quote its authors, it "contains reference and design data useful in the planning and construction of modern heating and ventilating installations, prepared from the society's transactions, the investigations of its research laboratory and the practice of its members." The statement is a modest definition of an extremely useful book. Frederick D. Mensing and the Guide Publication Committee are greatly to be commended. More might have been said in this volume about the controversial subject, methods of combustion, but perhaps lack of space and a desire not to enter into controversy caused this subject to be avoided.

### Byproduct Coking

An excellent book but somewhat too closely devoted to British practice is that by the late G. Stanley Cooper and Ernest M. Myers. It is entitled "Byproduct Coking." We say it is British primarily because it says nothing about the Roberts oven which has done so much to revolutionize American coking possibilities by making it possible to make coke out of Illinois coal. It says nothing about American practice with its short coking time and high temperatures. It seems strange that the latter subject is untouched, for a remarkable paper on the advantages of American practice has been published in most or all of the British papers which make coking a subject for attention.

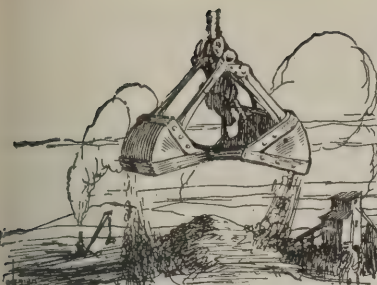
### SPEAK A COMMON LANGUAGE

Nevertheless the practice in the United States is confessedly based on European practice and Coppée, Otto, Simon-Carves, Koppers, Semet-Solvay and Wilputte are almost household words among byproduct-coke men in the United States, though Collin, Huesener and Simplex and the company which is named, Coke and Gas Ovens, Ltd., are not by any means so generally known. The brief preparation section of this book is, however, wholly alien to our practice and describes nothing but Coppée and Baum (Simon-Carves) washers. Readers will be interested in one reference to American practice which seems to indicate one of the reasons why byproduct ovens are not placed at coal mines, though another and perhaps more important reason is because there is little opportunity to use the gas, unless the mines are near a town or a large blast furnace where the gas can be used for domestic purposes or for engines as the case may be.

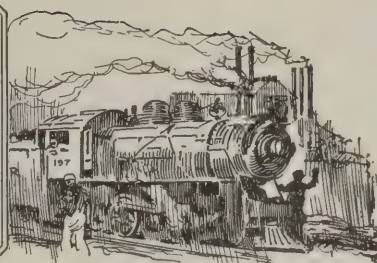
"In Great Britain" says one of the authors, "little has been done in the way of scientific mixing of various classes of coal, but in America coal mixing is much resorted to, and the mixtures are so arranged that a coke is produced suitable in all respects for American blast-furnace practice. Coals from several districts are thoroughly combined in special mixing chambers, the proportions of each being previously determined as a result of careful tests and comparisons. These chambers serve as receptacles for the different coals, and mechanical means are provided to insure thorough admixture and the production of a homogeneous coke. This mixing is the key to the success of the plan."

The book deals with the oven itself and its operation, with the machinery by which the coal and coke are handled and the gas exhausted, the recovery of tar, ammonia and benzol, condensers and scrubbers, utilization of surplus coke-oven gas, tar distillation, chemical tests and the future developments of the industry. It contains 192 pages measuring 5½ x 8½ in. and 131 illustrations, including 18 folded plates. Cloth bound. Price \$4.50. The American publisher of this Benn Bros.' book is D. Van Nostrand Co., 8 Warren St., New York City.





# Production And the Market



## Demand in Bituminous-Coal Market Gaining Accompanied by Better Prices

Stimulated by the seasonal urge of cooler weather, the bituminous-coal trade continues to show the steady advance that set in a few weeks ago. Prices are still climbing, the gains being due almost entirely to the increasing demand for the larger sizes, quotations for slack showing a marked downward tendency. The process of readjustment in general industrial conditions is still in evidence, and as a result consumers are buying carefully. Nevertheless, hitherto tardy buyers on contract are reappearing here and there and signing up. With the acceptance of a 10-per cent cut in wages by 14,000 textile workers resumption of operations on full time in a large number of New England plants that have been long idle is announced for Oct. 1. Meanwhile other industries report increases in employees, payrolls and earnings per capita.

### Price Index Advances Again

Coal Age Index of spot prices of bituminous coal continues its upward course, advancing two points during the last week to 169 on Sept. 22, the corresponding price for which is \$2.04. This compares with 167 and \$2.02 respectively on Sept. 15.

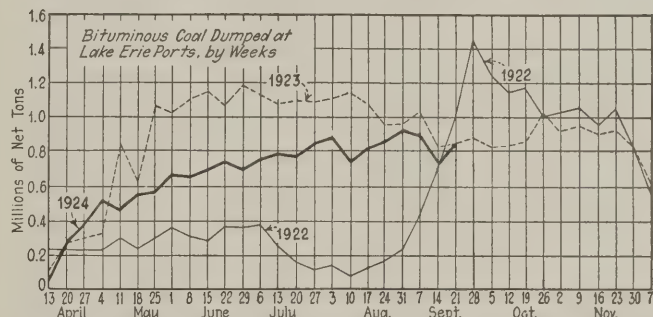
A further increase in activity was in evidence at Hampton Roads last week, dumpings of coal for all accounts for the seven days ending Sept. 18 totaling 383,710 net tons, compared with 338,432 tons handled during the preceding week.

Although the movement of coal up the lakes has declined markedly from the peak reached during the last week in August, total shipments being nearly six million tons less than at this time a year ago, the carryover of four million tons from last year must be considered in any estimate of the adequacy of the available supply. There was practically no carryover from 1922 to 1923. Dumpings during the week ended Sept. 21, ac-

cording to the Ore & Coal Exchange, were as follows: For cargo, 770,331 net tons; for fuel 45,957 tons, compared with 705,606 and 42,598 tons respectively during the previous week.

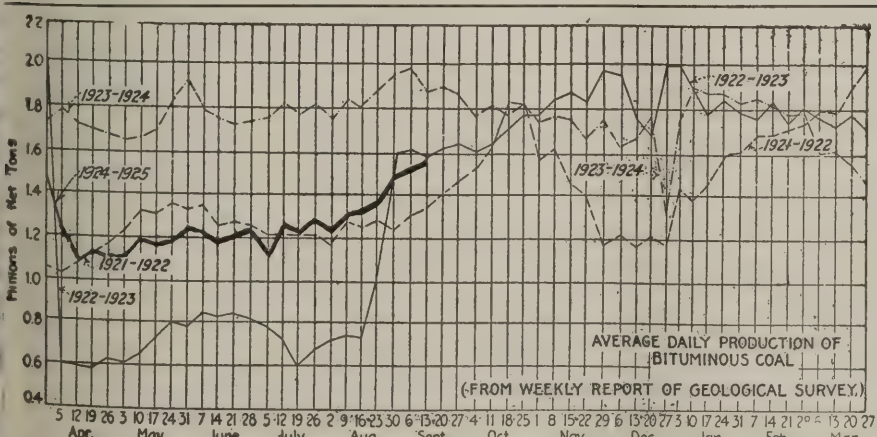
### Sharp Increase in Output

Production of bituminous coal registered a sharp rebound during the week ended Sept. 13, when, according to the Geological Survey, 9,531,000 net tons was produced, a gain of 573,000 tons over the week ended Sept. 6, when the output was 7,958,000 tons, according to revised figures. The comparatively low total of the



previous week, of course, was due to the short week occasioned by the observance of Labor Day. There also was a marked increase in the production of anthracite during the week ended Sept. 13, the output totaling 1,820,000 net tons, compared with 1,451,000 tons during the preceding week.

The anthracite market continues to gain headway, tonnage moving with increasing ease. Stove maintains the leadership in demand, but egg and nut are moving more rapidly. Steam sizes likewise are gaining in strength. Independent quotations for domestic sizes show a growing firmness.



### Estimates of Production

(Net Tons)			
BITUMINOUS			
	1923	1924	
Aug. 30	11,737,000	8,719,000	
Sept. 6 (a)	10,485,000	7,958,000	
Sept. 13 (b)	11,378,000	9,531,000	
Daily average	1,896,000	1,588,000	
Cal. yr. to date (c)	388,212,000	312,102,000	
Daily av. to date	1,793,000	1,437,000	
ANTHRACITE			
Aug. 30	1,893,000	1,837,000	
Sept. 6	3,000	1,451,000	
Sept. 13	2,000	1,820,000	
Cal. yr. to date (c)	68,490,000	64,058,000	
COKE			
Sept. 6 (a)	345,000	112,000	
Sept. 13 (b)	317,000	111,000	
Cal. yr. to date (c)	13,795,000	7,204,000	

(a) Revised since last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.



### Midwest Lump Up; Steam Down

Stiff demand for domestic sizes of the best Midwest coals continues but a softening of the weather is expected to produce a quieting effect. In fact this effect is already beginning to make itself felt in central Illinois and in the Standard district. Business is heavy enough even in those fields, however, to keep every open mine running most of the time. No further increase in lump and egg prices is expected soon in those regions. East Kentucky and West Virginia business in the Midwest continues so pressing that producers are declining orders for domestic sizes. Smokeless lump is now solidly fixed at \$4, and mine run, though still running at \$2, may take an overdue rise by Oct. 1.

The inevitable result of all this rush of domestic business is a slump in steam coal in most fields. Good southern Illinois screenings several days ago sank past their previous bottom of \$1.50 and now range clear down to \$1.25. Central Illinois steam coal runs down to \$1.10 and Standard district is well below \$1. This means that practically everything won in higher domestic prices is lost on screenings. No car shortage of any serious proportions has developed in the Midwest fields but the Illinois Central felt the pressure sufficiently to begin on Sept. 15 counting "no bills" as empties. Other roads did not follow suit last week. However, Illinois Central mines are not heavily burdened with

"no bills," even in steam sizes, so nobody is suffering much from the order.

Mines in the Duquoin and Jackson County field are working and coal is moving, with the exception of nut and screenings. Three days a week seems to be the limit in these fields. In the Mt. Olive district domestic tonnage is beginning to move and things are opening up. Nearly all the mines have a couple of days a week with steam sizes going on contracts and railroad tonnage good. In the Standard district, steam is holding back working time. Screenings are hard to move and steam nut and egg are impossible. Six-inch lump and 3x6-in. egg are in fairly good demand and 2-in. lump is beginning to move. Mines here are getting three to four days a week and could do better were it not for steam sizes.

In St. Louis the first chilly wave brought the business that should have come to the dealers two months ago. Nearly all of this demand is for lump coal and has occasioned an advance of 50c. a ton in two weeks. Dealers are asking the same price for egg as for lump, even though they can buy egg for 25c. a ton less. Business seemingly is going to southern Illinois high-grade this season. The retail price on this advanced from \$6.75 to \$7 with prospects of a further advance in a day or two. Mt. Olive, which has not begun to sell yet, advanced from \$5.75 to \$6. Standard remains at \$4.75@5.

### Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern					Midwest				
	Market Quoted	Sept. 24 1923	Sept. 8 1924	Sept. 15 1924	Sept. 22 1924†		Market Quoted	Sept. 24 1923	Sept. 8 1924
Smokeless lump.....	Columbus....	\$5.95	\$3.60	\$3.60	\$4.00@4.25	Franklin, Ill. lump.....	Chicago....	\$4.15	\$3.10
Smokeless mine run.....	Columbus....	3.00	2.00	2.00	1.95@2.25	Franklin, Ill. mine run.....	Chicago....	3.00	2.35
Smokeless screenings.....	Columbus....	2.35	1.20	1.20	1.15@1.30	Franklin, Ill. screenings.....	Chicago....	1.40	1.65
Smokeless lump.....	Chicago....	6.10	3.60	3.85	3.75@4.00	Central, Ill. lump.....	Chicago....	3.10	2.60
Smokeless mine run.....	Chicago....	2.85	1.85	1.90	1.85@2.00	Central, Ill. mine run.....	Chicago....	2.20	2.20
Smokeless lump.....	Cincinnati....	6.10	3.75	3.85	3.75@4.00	Central, Ill. screenings.....	Chicago....	1.00	1.55
Smokeless mine run.....	Cincinnati....	3.00	1.85	1.85	1.75@2.00	Ind. 4th Vein lump.....	Chicago....	3.00	2.85
Smokeless screenings.....	Cincinnati....	2.25	1.35	1.35	1.00@1.25	Ind. 4th Vein mine run.....	Chicago....	2.60	2.35
*Smokeless mine run.....	Boston....	5.05	4.10	4.15	4.10@4.30	Ind. 4th Vein screenings.....	Chicago....	1.35	1.65
Clearfield mine run.....	Boston....	2.15	1.90	1.90	1.45@2.35	Ind. 5th Vein lump.....	Chicago....	2.75	2.50
Cambria mine run.....	Boston....	2.85	2.25	2.25	2.00@2.60	Ind. 5th Vein mine run.....	Chicago....	2.10	2.10
Somerset mine run.....	Boston....	2.35	2.05	2.05	1.75@2.40	Ind. 5th Vein screenings.....	Chicago....	1.05	1.50
Pool 1 (Navy Standard).....	New York....	3.25	2.75	2.75	2.50@3.00	Mt. Olive lump.....	St. Louis....	3.00	2.85
Pool 1 (Navy Standard).....	Philadelphia....	3.25	2.40	2.40	2.35@2.50	Mt. Olive mine run.....	St. Louis....	2.25	2.50
Pool 1 (Navy Standard).....	Baltimore....		2.60	2.60	2.35@2.85	Mt. Olive screenings.....	St. Louis....	1.25	1.75
Pool 9 (Super. Low Vol.).....	New York....	2.25	2.10	2.10	1.90@2.35	Standard lump.....	St. Louis....	2.80	2.15
Pool 9 (Super. Low Vol.).....	Philadelphia....	2.55	2.15	2.15	1.95@2.35	Standard mine run.....	St. Louis....	2.05	1.80
Pool 9 (Super. Low Vol.).....	Baltimore....	2.45	1.85	1.85	1.80@1.90	Standard screenings.....	St. Louis....	.80	1.20
Pool 10 (H.Gr. Low Vol.).....	New York....	2.15	1.80	1.80	1.70@2.00	West Ky. lump.....	Louisville....	2.35	2.45
Pool 10 (H.Gr. Low Vol.).....	Philadelphia....	2.10	1.75	1.75	1.65@1.90	West Ky. mine run.....	Louisville....	1.90	1.60
Pool 10 (H.Gr. Low Vol.).....	Baltimore....	2.25	1.60	1.60	1.60@1.70	West Ky. screenings.....	Louisville....	.85	1.30
Pool 11 (Low Vol.).....	New York....	1.85	1.60	1.60	1.50@1.75	West Ky. lump.....	Chicago....	2.60	2.35
Pool 11 (Low Vol.).....	Philadelphia....	1.85	1.45	1.45	1.35@1.60	West Ky. mine run.....	Chicago....	1.95	1.60
Pool 11 (Low Vol.).....	Baltimore....	2.00	1.45	1.45	1.50@1.60				
High-Volatile, Eastern					South and Southwest				
Pool 54-64 (Gas and St.).....	New York....	1.75	1.50	1.50	1.40@1.65	Big Seam lump.....	Birmingham....	3.75	3.10
Pool 54-64 (Gas and St.).....	Philadelphia....		1.50	1.50	1.40@1.60	Big Seam mine run.....	Birmingham....	1.95	1.75
Pool 54-64 (Gas and St.).....	Baltimore....	1.75	1.35	1.35	1.35@1.50	Big Seam (washed).....	Birmingham....	2.35	2.00
Pittsburgh ac'd gas.....	Pittsburgh....	2.80	2.40	2.40	2.30@2.50	S. E. Ky. lump.....	Chicago....	3.35	2.50
Pittsburgh gas mine run.....	Pittsburgh....	2.40	2.10	2.10	2.00@2.25	S. E. Ky. mine run.....	Chicago....	2.25	1.60
Pittsburgh mine run (St.).....	Pittsburgh....	2.15	1.85	1.85	1.75@2.00	S. E. Ky. lump.....	Louisville....	3.10	2.50
Pittsburgh slack (Gas).....	Pittsburgh....	1.40	1.35	1.35	1.20@1.30	S. E. Ky. mine run.....	Louisville....	2.00	1.50
Kanawha lump.....	Columbus....	3.15	2.10	2.10	2.00@2.25	S. E. Ky. screenings.....	Louisville....	1.05	.90
Kanawha mine run.....	Columbus....	1.90	1.40	1.40	1.30@1.55	S. E. Ky. lump.....	Cincinnati....	3.50	2.50
Kanawha screenings.....	Columbus....	1.05	1.10	1.05	1.00@1.10	S. E. Ky. mine run.....	Cincinnati....	1.60	1.45
W. Va. lump.....	Cincinnati....	3.75	2.35	2.30	2.25@2.50	S. E. Ky. screenings.....	Cincinnati....	1.05	1.00
W. Va. gas mine run.....	Cincinnati....	1.75	1.50	1.45	1.40@1.60	Kansas lump.....	Kansas City....	4.50	4.50
W. Va. steam mine run.....	Cincinnati....	1.75	1.35	1.35	1.25@1.50	Kansas mine run.....	Kansas City....	3.50	3.50
W. Va. screenings.....	Cincinnati....	1.10	.90	1.05	.85@1.00	Kansas screenings.....	Kansas City....	2.60	2.50
Hooking lump.....	Columbus....	3.10	2.40	2.40	2.40@2.65				
Hooking mine run.....	Columbus....	1.95	1.55	1.55	1.45@1.65				
Hooking screenings.....	Columbus....	1.05	1.15	1.15	1.10@1.25				
Pitts. No. 8 lump.....	Cleveland....	2.60	2.35	2.30	2.00@2.75				
Pitts. No. 8 mine run.....	Cleveland....	2.05	1.85	1.85	1.75@1.90				
Pitts. No. 8 screenings.....	Cleveland....	1.25	1.20	1.15	1.10@1.20				

\* Gross tons, f.o.b. vessel, Hampton Roads.

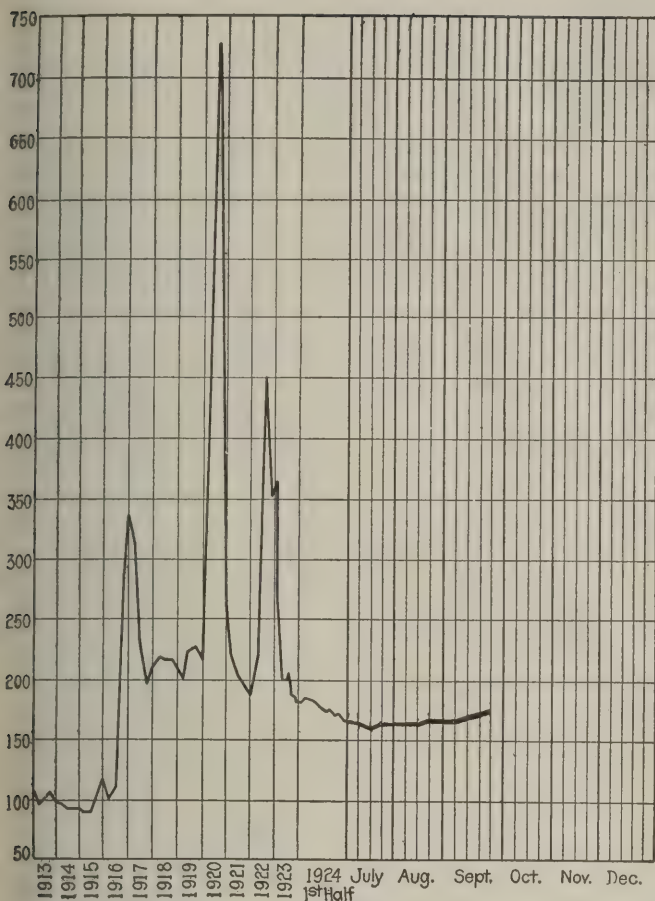
† Advances over previous week shown in heavy type, declines in italics.

### Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

		Market Quoted	Freight Rates	Sept. 24, 1923		Sept. 15, 1924		Sept. 22, 1924†	
				Independent	Company	Independent	Company	Independent	Company
Broken.....	New York....	\$2.34			\$8.00@9.25		\$8.00@9.25		\$8.00@9.25
Broken.....	Philadelphia....	2.39					9.15		9.15
Egg.....	New York....	2.34		\$9.60@11.50	8.75@9.25	\$8.50@9.40	8.75@9.25	\$9.00@9.50	8.75@9.25
Egg.....	Philadelphia....	2.39		9.85@12.20	8.75@9.25	9.00@9.70	8.80@9.25	9.00@9.70	8.80@9.25
Egg.....	Chicago....	5.06				8.17@8.27	8.14@8.20	8.17@8.27	8.14@8.20
Stove.....	New York....	2.34		9.85@11.50	8.75@9.25	9.25@10.00	8.75@9.50	9.25@10.00	8.75@9.50
Stove.....	Philadelphia....	2.39		9.85@12.20	8.75@9.25	9.35@10.00	9.15@9.50	9.35@10.00	9.15@9.50
Stove.....	Chicago....	5.06				8.63@8.75	8.50@8.64	8.63@8.75	8.50@8.64
Chestnut.....	New York....	2.34		9.85@11.50	8.75@9.25	8.75@9.45	8.75@9.25	9.00@9.50	8.75@9.25
Chestnut.....	Philadelphia....	2.39		9.85@12.20	8.75@9.25	8.85@9.80	9.15@9.25	8.85@9.80	9.15@9.25
Chestnut.....	Chicago....	5.06				8.26@8.40	8.44@8.60	8.26@8.40	8.44@8.60
Pea.....	New York....	2.22		6.75@7.50	6.15@6.65	5.00@5.25	5.50@6.00	5.25@5.50	5.50@6.00
Pea.....	Philadelphia....	2.14		6.75@9.00	6.25@6.60	5.75@6.25	5.75@6.00	5.75@6.25	5.75@6.00
Pea.....	Chicago....	4.79				5.13@5.45	5.36@6.20	5.13@5.45	5.36@6.20
Buckwheat No. 1.....	New York....	2.22		2.75@3.50	3.50	2.25@2.90	3.00@3.15	2.25@2.90	3.00@3.15
Buckwheat No. 1.....	Philadelphia....	2.14		3.00@3.50	3.50	2.50@3.00	3.00	2.50@3.00	3.00
Rice.....	New York....	2.22		2.25@2.50	2.50	1.75@2.00	2.00@2.25	1.95@2.25	2.00@2.25
Rice.....	Philadelphia....	2.14		2.00@2.50	2.50	2.00@2.25	2.25	2.00@2.25	2.25
Barley.....	New York....	2.22		1.25@1.50	1.50	1.25@1.50	1.50	1.25@1.50	1.50
Barley.....	Philadelphia....	2.14		1.50	1.50	1.50	1.50	1.50	1.50
Birdseye.....	New York....	2.22			1.60		1.60		1.60

\* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.





Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

	1924			1923
	Sept. 22	Sept. 15	Sept. 8	Sept. 24
Index .....	169	167	166	200
Weighted average price....	\$2.04	\$2.02	\$2.01	\$2.42

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke; 1913-1918," published by the Geological Survey and the War Industries Board.

### Kentucky Is Oversold

Demand for coal in Kentucky is quite heavy. Many operating companies are sold up, running full time, and refusing business that doesn't carry a good price. The result is that prepared quotations are 25 to 50c. a ton higher than they were a week ago. Western Kentucky producers are asking \$2.75@3 for best block, while eastern Kentucky operators are going them one better and quoting \$2.75 @ \$3.25. Lump is \$2.50@2.75 in both fields, with egg moving at the lump price in western Kentucky, and about 25c. a ton under lump in eastern Kentucky. Mine run and screenings are practically unchanged.

The better prices and steady demand may influence a few small companies to sign the Jacksonville agreement in the strike zone of western Kentucky, one large company having given in over the week. However, the operators whose mines are down on account of the strike, are generally figuring on being down for years, instead of months, unless they can go on a non-union basis or "bust" the union. Right now, however, it looks as if the producers can sell all the coal they can mine, and at excellent prices.

### Northwest Is Busy

Receipts at the Duluth docks fell off last week, when only 33 cargoes were landed, and of these, five were hard coal. Twelve cargoes are en route and one of these is hard coal. It is thought that receipts will gradually fall off from now on, as the grain trade is rushing and the docks are fairly full. The dock companies evidently are not figuring on carrying a large surplus over after the close of navigation.

The 28c. increase in rates from southern Illinois mines to Twin Cities has been confirmed by the Interstate Commerce Commission and Duluth dealers expect more Twin City business as a consequence. The hard-coal movement is large, although a warm spell which started last Wednesday may stop shipments. Country dealers say that they fear a rail tie-up and hope to turn over quickly the stocks they are ordering. Soft coal is moving well, although there is no rush. It might be termed normal business. The docks are shipping steadily.

Milwaukee coal dealers are more buoyant in spirit. Orders are flowing in, and coal is moving from the docks. There is a notable tendency toward firmness in prices. Southern Illinois mines have advanced their figures 15 to 25c. a ton to dealers and the Pocahontas mines are not taking orders because they are well sold up. Milwaukee dealers expect an advance in Pocahontas of 50 to 75c. a ton. The total receipts of coal at Milwaukee by lake thus far in 1924 are 552,954 tons of anthracite and 1,488,310 tons of bituminous coal.

### Western Business Is Quiet

The demand for Southwestern production has improved steadily since Sept. 1. Mines already open are working almost full time and more mines are expected to be reopened in Kansas soon. The quotation on Henryetta (Okla.) lump has been advanced to \$5.50. Oklahoma nut is quoted at \$4, mine run at \$3.25 and screenings at \$2. Kansas shovel lump coal has been advanced 25c. to \$4.25. The prices for other grades of shovel coal are the same as those for shaft: \$4 for nut, \$3@3.50 for mine run and \$2.35 for screenings. Present quotations show a cut of 15c. on screenings, which have shown a tendency to move more slowly than domestic grades, although there is no surplus yet.

Last week was rather dull throughout Colorado, which resulted in a notable decrease both in the production and working time of mines. However, during the last few days the heavy demands for all sizes have been encouraging and operators are preparing for a busy season to begin soon. Colorado mines worked on an average of 25 hours last week and less than 30 per cent of working time lost was attributed to "no market." Prices remain unchanged.

In Utah mines are still operating less than three days a week. They are shipping more coal to the Northwestern markets than they were, but the demand from the Pacific Coast is poor. Very little business has been obtained by the Utah operators in this market since storage orders were filled about the middle of August.

### Sellers' Market at Cincinnati

For the first time in ten months the situation at Cincinnati has changed from a buyers' to a sellers' market. Most offices have available supplies well booked to the end of the month. Buyers from Cleveland, Toledo and other lake ports have appeared in quest of slack and the smaller sizes. Two-inch has stiffened and domestic holds firm. In smokeless there has been a general disposition to move the domestic price up to \$4. The run of mine business in low volatile is acceptable at \$2 and there isn't much stuff moving under that. The slack is the weak brother. Because of the large call for the sized coals there has been a perceptible weakening in the Western movement.

Domestic trade in Columbus and central Ohio shows a decided improvement. Buying of the better grades has resulted in higher prices on smokeless and certain varieties of splints. Industrial conditions are improving, though steam buying is restricted to present needs, some of the larger consumers still using up reserves. Contracting is quiet. Utilities are fair purchasers while carriers are buying less than normal. Production is showing slight increases in all producing areas of Ohio.

The steam trade at Cleveland seems to be moving along in alternate waves of strength and weakness, though a steadily increasing demand is evident, and spot prices are holding firm at recent quotations. Inquiries are fair and steam purchasers are buying moderate quantities, both for current needs and storage. Many mines in eastern Ohio report car shortage on one large railroad, due to open-top cars being on other divisions of the road and the further fact that repair work on bad-order cars has been deferred until their need was imminent. The railroads report increased traffic and there is a better tone all around, business conditions showing improvement.



### Tonnage Moving Better at Pittsburgh

Coal movement out of the Pittsburgh district has increased slightly in the past week or two. Measured by conditions in the steel industry, there has been no increase in industrial activity since Sept. 1. Some consumers are now stocking coal in a limited way, however, the liquidation of old stocks having been practically completed several weeks ago. The call for domestic coal is slowly rising.

Further improvement is noted in central Pennsylvania, but the increase in output is not large. Wagon mines are picking up business for delivery to the cities and the car loadings for the week ending Sept. 13 were 13,120, as against 10,818 for the previous week, which had one holiday. There are 1,800 "no bill" cars.

The general tendency in the Buffalo market is still a stand-off, there being slight improvement if anything. Quite a large percentage of West Virginia coal is coming in, paying 15c. a ton freight over Pittsburgh and still able to come out whole some way. Regular quotations remain at \$2.25@ \$2.50 for Youghiogheny gas lump, \$2@ \$2.25 for Pittsburgh and No. 8 steam lump, \$1.75@ \$2 for all mine run and \$1.10@ \$1.35 for slack, paying \$2.09 from Allegheny Valley mines and \$2.24 from other mines for freight to Buffalo.

Industrial conditions at Toronto show little change, the demand for bituminous continuing light. Quotations for carload lots f.o.b. destination are: Steam lump \$6@ \$6.40; Pennsylvania smokeless, \$5.75@ \$6.25.

### Weakness Reappears in New England

The firmer tendency noted in the New England tidewater bituminous market last week has not been maintained and a weakness even more pronounced than heretofore has developed. To move an oversupply certain shippers have named \$5.15@ \$5.20 per gross ton on cars Boston for what is claimed to be Pool 1 run of mine New River and Pocahontas and orders have been acceptable at this level regardless of the amount ordered. There has been no decline in spot f.o.b. prices at the southern loading piers for strictly high-grade coals, however, \$4.10 being the minimum and up to \$4.30 asked in certain instances.

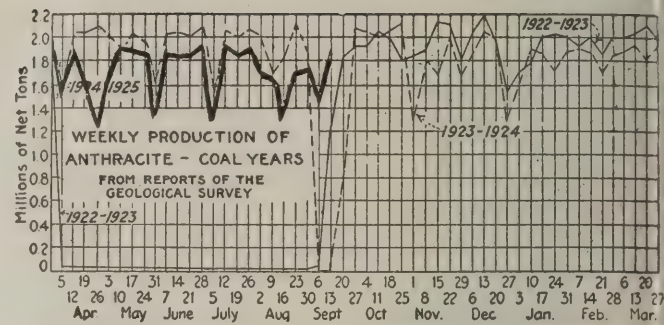
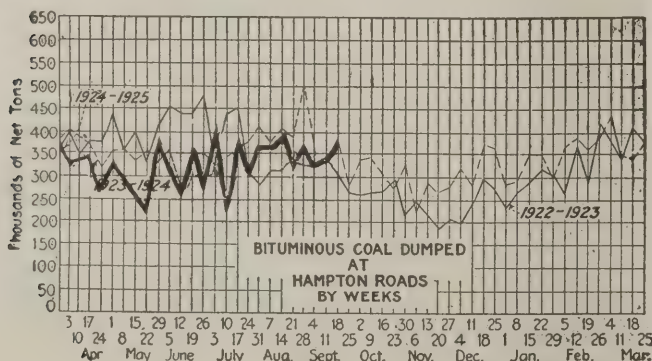
The all-rail market offers nothing new. A few inquiries have come forward but they have not resulted in business because prices cannot be made to compete with the landed cost of coal from tidewater.

The Providence tidewater market maintains a higher price level than Boston. Some early-week sales were at \$5.25 on cars for pool 1 mine run New River, but this was to clean up cargoes and \$5.30 is now the low quotation, some business being done at 5c. to 10c. more. Arrivals have been fairly plentiful the past week but as most of it has been in barges shippers have not been under pressure.

The retail demand for anthracite has expanded considerably.

### Atlantic Markets Slowly Gaining

Business at New York during the past week has not been as brisk in some quarters as the previous week, though receipts move easily. Some new business in contracts extending to April 1 was reported, but seller and buyer negotiate carefully. A firmer tendency is evident and the prospects for a busy late fall and winter are bright. Large consumers are willing to take more coal and it is not as hard as formerly to ship full quotas on contracts. The railroads are taking heavy tonnages and buying by various industries has been heavier. Receipts at tidewater piers are moderate and there is not as much free coal to be picked up at low prices.



Movement of tonnage at Philadelphia is increasing, but it is far from sufficient to enable mines to operate on full time. Producers are not at all keen in making contracts except at considerable advance on present market prices. Business conditions continue to improve, and consumers are taking more tonnage for storage, but still have far to go before they have anything like customary winter stocks. This applies to most coal users except railroads and central power plants. In the tide market there has been an increase in the number of boats chartered for general trade.

An upward trend has set in at Baltimore, inquiry having increased encouragingly. Prices have stiffened to some extent. The export situation in the last few days has developed a better tone, and shipments for the first half of September exceed those of the entire month of August.

A hopeful feeling exists at Birmingham. Spot buying is somewhat better and contracts are being signed here and there. Inquiry for bunker and export coal is still light, though there is a fair tonnage moving regularly to Cuban points and some to South American interests. The railroads are taking more coal than for several weeks.

### Demand for Anthracite Growing

Hard coal is moving easily in the New York market. The call for stove coal has become so heavy that some believe it will be necessary to start an educational campaign to encourage the use of other sizes. Egg and chestnut also are moving rapidly and without any trouble. The demand for the last-named size shows a slight increase over last week. Independent quotations for the domestic coals are a little stronger, straight stove bringing as much as 50c. more than when taken with other sizes. Some of the independent operators are sold up for the next couple of weeks on the larger sizes. The steam sizes likewise are gaining strength.

Demand at Philadelphia from producers is holding its own, but with some difficulty, for with the exception of a strong demand for stove, all the other sizes are easy. Most operators find some difficulty in moving nut, pea remains almost stagnant and egg has not improved. Retailers feel that in order to make money they must advance prices in the face of increased mine prices. Steam coals are a trifle stronger, with better demand for buckwheat.

A tinge of chill in the air at Baltimore has increased orders for anthracite from householders. There is no rush, it is true, and stocks on hand are in most cases fairly liberal. The buyer, now that he knows that there is little chance of any early increase in retail prices, is not hurrying.

The situation at Buffalo is not much changed. When the weather turns threatening demand picks up, but a return of sunny days cuts it down again. Consumers depend on gas to a considerable extent. More small sizes of anthracite would be burned if a simple and effective blower device were obtainable.

Contracting for fourth-quarter coke at Connellsville is now completed, except as idle furnaces may go in, there being no immediate prospect of this. The contracting movement involved less tonnage than expected. The spot market remains quotable at \$3@ \$3.10. Spot foundry coke is easier in tone, but remains quotable at \$4@ \$4.50.

### Car Loadings, Surpluses and Shortages

	Cars Loaded—	
	All Cars	Coal Cars
Week ended Sept. 6, 1924.....	920,979	149,473
Previous week.....	1,020,339	168,584
Week ended Sept. 8, 1923.....	928,916	153,022

	Surplus Cars—		Car Shortage—	
	All Cars	Coal Cars		
Sept. 7, 1924.....	194,306	97,089	.....	.....
Aug. 31, 1924.....	231,667	111,254	274	.....
Sept. 7, 1923.....	67,651	13,501	10,211	5,595



# Foreign Market And Export News

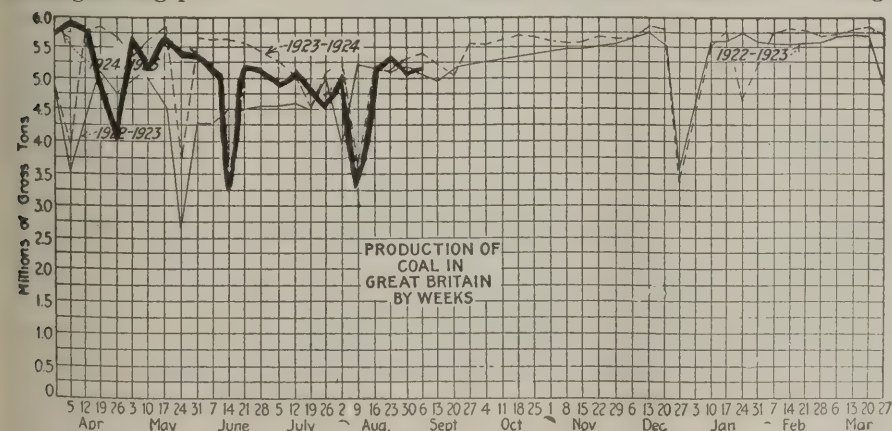
## Confidence Wanes in British Market; Upturn in Output

A less confident tone is strongly in evidence in the Welsh coal market, the volume of business done during the last week having perceptibly decreased. The apprehension of operators and miners regarding the effect of the Dawes plan on the coal industry in this country has spread to exporters, who are fearful of difficulty in selling coal against increasing German competition. The operators have resolutely declined to cut their prices any further, and many of them prefer to close their pits rather than to increase their losses by accepting lower figures. The lower grades of coal are keenly feeling the competition from the north of England, and, though Admiralty qualities are fairly easily disposed of, small coals are a problem. Inquiry from the Continent has decreased somewhat, and the home trade is quiet.

The Newcastle market on the whole seems to be getting steadily into greater difficulties. Prices are at their lowest ebb, and the pits are working short time where they are working at all. German, French and Belgian business is poor and trade with Italy has declined. Unemployment in Durham and Northumberland is getting to be a serious problem, and the miners take the view that reparation coal is responsible for all their troubles.

Production by British collieries during the week ended Sept. 6, a cable to *Coal Age* states, was 5,180,000 tons according to the official reports. This compares with 5,113,000 tons produced during the week ended Aug. 30.

Notice of termination of contracts has been given to 2,000 miners in Wales, the contention of the operators being that the workings are old and that production costs have been prohibitive. In Warwickshire 800 men have had seven day's notice to terminate contracts, the reason being that the operators cannot any longer carry their losses. In all cases efforts are being made to get the men employment at neighboring pits.



## French Household Coal Active; Industrial Grades Lag

There is no material change in the French coal market; the situation in industrial coals is still quiet, the stocks of no considerable importance; the house-coal trade conspicuously active.

The price schedule for October has not been established yet, but the opinion is that prices will remain unaltered, with, perhaps, the exception of dry and anthracite fuels.

Trading in British coals is almost at a standstill.

The Paris market continues to be bombarded with German tenders for the free sale of coal. The tonnage received so far, however, has been extremely small.

The agreements between the Ruhr industrialists and the M. I. C. U. M. have been renewed and will remain in force during the transitory period contemplated by the London protocol, comprised between the first and second verification dates of the Reparation Commission, that is, from Sept. 1 to Oct. 7.

Under the terms of these agreements the German mines have agreed to continue deliveries of coal and byproducts based on the programme established by the Reparation Commission. The prices will be fixed by mutual convention between the Reparation Commission and the German Government.

## Domestic Trade Strengthens Hampton Roads Market

Business at Hampton Roads shows some improvement, the domestic situation giving a boost to the trade. Tide-water business has not felt any real effect of the upturn in the domestic market, but the general outlook is pronounced better.

Domestic coal has strengthened from 50 to 75c. a ton, and there seems to be a seasonal increase in demand for all business, due to the increase in steel trade and other conditions. Foreign

business, however, showed no improvement, but the bunker trade has substantially increased. This has had a tendency to boost the market. Coast-wise movement is holding its own, with prospects of advancement soon.

## Export Clearances, Week Ended Sept. 20, 1924

FROM HAMPTON ROADS	
For Argentina:	Tons
Ital. Str. Fiume, for Buenos Aires....	8,455
For Brazil:	
Br. Str. Vulcan City, for Rio de Janeiro .....	6,707
Br. Str. Ethelwolf, for Rio Grande do Sul .....	5,923
For Canada:	
Br. Str. Chalister, for Three Rivers ..	8,608
Br. Str. Chatham, for Bridgetown..	5,398
For France:	
Fr. Str. P. L. M., 24 for Marseilles ..	8,211
For Malta:	
Ital. Str. Alberta No. 8.....	2,079
For Porto Rico:	
Amer. Schr. Rachel W. Stevens, for Humacao .....	1,316
For West Indies:	
Nor. Str. Korsfjord for Kingston....	2,087

FROM BALTIMORE	
For Porto Rico:	
Am. Str. Major Wheeler, for San Juan .....	3,232
For Cuba:	
Am. Schr. William H. Marston, for Cienfuegos .....	1,766
Am. Str. Mangore, for Daiquiri.....	3,505
Am. Schr. Jacob W. Hook, for Manzanillo .....	908
For Canada:	
Dan. Str. Nordfarer, for Corner Brook .....	5,600
For Italy:	
Ital. Str. M. T. Cicerene, for Civita Vecchia .....	9,353

FROM PHILADELPHIA	
For Cuba:	
Nor. Str. Mathilda, for Antilla.....	—

## Hampton Roads Pier Situation

N. & W. Piers, Lamberts Pt.:	Sept. 11	Sept. 18
Cars on hand.....	1,757	1,447
Tons on hand.....	110,648	92,367
Tons dumped for week.....	101,861	122,868
Tonnage waiting.....	7,000	2,000
Virginian Piers, Sewalls Pt.:		
Cars on hand.....	1,300	1,704
Tons on hand.....	90,600	111,100
Tons dumped for week.....	112,464	83,230
Tonnage waiting.....	2,207	13,038
C. & O. Piers, Newport News:		
Cars on hand.....	2,012	2,040
Tons on hand.....	107,985	105,865
Tons dumped for week.....	87,847	136,501
Tonnage waiting.....	2,150	1,075

## Pier and Bunker Prices, Gross Tons

PIERS			
	Sept. 13		Sept. 20†
Pool 9, New York....	\$4.60@	\$5.00	\$4.60@ \$5.00
Pool 10, New York....	4.50@	4.75	4.50@ 4.75
Pool 11, New York....	4.25@	4.50	4.35@ 4.50
Pool 9, Philadelphia..	4.90@	5.25	4.90@ 5.25
Pool 10, Philadelphia..	4.45@	4.70	4.45@ 4.70
Pool 11, Philadelphia..	4.30@	4.50	4.30@ 4.50
Pool 1, Hamp. Roads.	4.00@	4.15	4.10@ 4.25
Pool 2, Hamp. Roads.		3.90	3.90@ 4.00
Pools 5-6-7 Hamp. Rds.	3.85@	3.90	3.85
BUNKERS			
Pool 9, New York....	\$4.90@	\$5.30	\$4.90@ \$5.30
Pool 10, New York....	4.80@	5.05	4.80@ 5.05
Pool 11, New York....	4.55@	4.80	4.65@ 4.80
Pool 9, Philadelphia..	4.90@	5.25	4.90@ 5.25
Pool 10, Philadelphia..	4.75@	4.95	4.75@ 4.95
Pool 11, Philadelphia..	4.50@	4.70	4.50@ 4.70
Pool 1, Hamp. Roads.		4.15	4.10@ 4.25
Pool 2, Hamp. Roads.		4.00	4.00@ 4.10
Pools 5-6-7 Hamp. Rds.	3.90		3.90

## Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations by Cable to <i>Coal Age</i>		
Cardiff:	Sept. 13	Sept. 20†
Admiralty, large.....	28s. 6d. @ 29s.	28s. @ 28s. 6d.
Steam smalls.....	17s.	15s. @ 15s. 6d.
Newcastle:		
Best Steams.....	14s. @ 19s. 3d.	19s. @ 24s.
Best Gas.....	19s. 6d. @ 23s.	21s. @ 22s.
Best Bunkers.....	18s. @ 19s.	19s.

†Advances over previous week shown in heavy type, declines in italics.





## News Items From Field and Trade



### ALABAMA

A. F. Hilleke, manager of the coke department of the Semet-Solvay Co. and manager of the Solvay Process Company, has resigned. His assistant, J. H. White, has been appointed assistant to the vice-president of the Semet-Solvay Co. only, with jurisdiction over the Southern plants and those operated by the company elsewhere. Mr. Hilleke was district manager of the Semet-Solvay Co., having charge of all Southern plants, during the war. He supervised the construction of the North Birmingham plant of the Sloss-Sheffield Steel & Iron Co., where the Solvay process of coke manufacture is used. He was promoted to the Syracuse offices in charge of all coking plants in America five years ago.

The Pratt Fuel Corporation has made another addition to its active operations and coal land holdings by the purchase of the properties of the Nelson Coal Corporation for a consideration reported at approximately \$250,000. The lands of the Nelson corporation adjoin some of the holdings of the Pratt corporation recently acquired and carry one development on the Mary Lee seam at Red Star mines and consist of about 1,200 acres of coal-bearing lands on the Southern Ry. in Walker County. Frank Nelson, former president of the Nelson Coal Corporation and a well-known operator in the district for many years, becomes a director of the Pratt Fuel Corporation.

### COLORADO

John F. McDermott, formerly with the Leyden Coal Co., has been appointed assistant to W. F. Oakes, president of the Sunnyside Coal Mining Co., with mines at Strong, in Huerfano County. Mr. McDermott is spending a few days with R. T. Bell, the general superintendent, at the mines, to acquaint himself with the personnel, the operation, and particularly the preparation, as on him will devolve to a great extent the sale of Sunnyside coal. The company is just completing the installation of a Link-Belt Knox loading boom and a box-car feeder. The loading boom installation will deliver lump to open cars, or to the box-car loader, with a minimum of breakage.

H. H. Pinckney, of West Virginia, has succeeded J. C. Cheyney as vice-president and receiver of the Canon Reliance Coal Co. The Denver office has been closed and the sale of the coal put in the hands of the Colorado Agency Co. Mr. Pinckney makes his headquarters at Canon City. The company is oper-

ating only the Canon mine. The Reliance mine at Ojo is being worked by the Purity Coal Co., of Pueblo, of which John W. McGovern is president, Andrew McGovern, secretary and treasurer, and P. G. Cameron, vice-president and general manager.

Despite adverse conditions in the shape of very soft rock in the west side, work on the Moffat tunnel is being pushed by Hitchcock & Tinkler, the contractors. The face on the west side is in 4,400 ft. and on the east side 4,900 ft. These distances have reference to the narrow bores.

### ILLINOIS

Coal for the St. Louis city water works has been contracted for with a Marion mine for approximately \$2.75 per ton. Other mines in Franklin, Williamson and nearby counties have obtained contracts aggregating about \$400,000 from the City of St. Louis for the coming season.

The Old Ben Coal Corporation is about to reopen a number of its mines in Franklin County. Mine No. 12, commonly known as the East Mine, located near Christopher, will resume operations in a few days. Mine No. 10, also at Christopher, known as the Old North Mine, is being cleaned up and was to resume coal hoisting on Sept. 22. About six hundred men are employed at each of the two mines.

The mine of the Valier Coal Co. at Valier, owned by the Chicago, Burlington & Quincy R.R., has again resumed operations after six weeks' idleness. The mine has a daily average of approximately 6,000 tons and is one of the most modern and best equipped mines in the state.

James McSherry, for the past several years assistant superintendent of the Equitable Coal & Coke Co.'s three mines in southern Illinois, has resigned effective at once. His future plans have not yet been announced. He has been closely connected with the coal trade in the southern part of the state and is widely known. The Equitable concern is owned by the Crear-Clinch interests, of Chicago.

### INDIANA

The Indiana mining examinations for mine boss, fire boss and hoisting engineer will be held Oct. 11, beginning at 9 a.m. at Garfield high school in Terre Haute, according to announcement by John Stevely, deputy state mine inspector, of Clinton. Citizens who are 21 years old or over are eligible to take the examinations.

The Dixie Vein Coal Co., Indianapolis, has increased its capital from \$50,000 to \$100,000.

The Indiana Public Service Commission has granted permission to the Evansville, Indianapolis & Terre Haute Railroad Co. to construct six miles of switch track from Somerville to Francisco to open a new mining district. Under the plans the railroad would cross nine roads, but only six will be grade crossings. One of the grades is eliminated by a subway and the railroad will build a new highway which will eliminate two other crossings.

### KANSAS

Mine No. 6 of the Hamilton Coal & Mercantile Co., near Cherokee, has been reopened. It employs 200 men.

The Crowe Coal Co. has announced its intention to open another of its deep shaft mines in the Pittsburgh district within a few days, but has not yet determined which mine it shall be.

Representatives of the international executive board, United Mine Workers, who, on Sept. 13 completed a survey of conditions in District 14, found miners of the district employed 49 per cent of full time. The investigators, John O'Leary and W. D. Van Horn, recommended that national officers send a board of organizers into the district immediately to work for "100 per cent membership" in the organization.

### KENTUCKY

Within the next few days official notification of the sale of various of the properties of the Jewett, Bigelow & Brooks Company in Harlan, Perry, Bell and Pike counties, will be made by the receivers, E. S. Douglass and J. C. Richey. A court order to this effect has been given by Judge A. M. J. Cochran of the U. S. District Court of the Eastern district of Kentucky. It is understood that the date of sale for some ten of the mines has been set for the last week in October.

No successor to replace the late C. D. Boyd, as manager of the coal traffic bureau jointly operated by the Southern Appalachian, Hazard and Harlan coal operators' associations, will be named soon, due to the fact that none of these organizations has meetings scheduled for some time to come. In the meantime, Roy Carson, Mr. Boyd's assistant, is looking after the affairs of the office.

The Rogers Elkhorn Coal Co., which was recently incorporated, will develop 1,100 acres of coal land near Virgie, to a daily output of 500 to 700 tons.



## NEW MEXICO

The Rio Grande Eastern R.R. has requested authority of the Interstate Commerce Commission to construct a line between Santa Fe and Albuquerque, which it is said will enable the Hagen Coal Mines, Inc., to market 20 cars of bituminous daily; permit the Sloan Coal Co. to resume operations and enable the construction of a power plant which will furnish power for mines in that district.

## NEW YORK

Quarterly dividends of \$1.75 have been declared on the preferred stocks of Burns Brothers. The dividend on the ordinary preferred is payable Oct. 1 and that on the prior preferred Nov. 1.

The Rochester & Pittsburgh Coal & Iron Co., general sales department, 1 Broadway, New York City, announces that effective Sept. 15 John M. Nelson, formerly general sales agent of the company and more recently sales agent in Buffalo, was appointed assistant to J. Noble Snider, vice-president in charge of sales, with headquarters in the Prudential Building, Buffalo. Charles Braun, Jr., has been appointed sales agent in charge of the Buffalo sales organization.

## OHIO

A. C. Ingersoll, president of the Philadelphia & Cleveland Coal Co., in passing through Cincinnati said that the large wharves, dockage and unloading facilities which have cost more than a quarter of a million dollars and which will be one of the most up-to-date plants on the river would be opened for business by his company about Oct. 1. These will be used for transshipping coal down the river from the Logan County (W. Va.) mines. The head offices of the company will be moved from Cleveland to Cincinnati, new quarters having been taken in the Dixie Terminal Building.

The Brush Fork Coal Co., of Athens, has opened a sales office in the Atlas Building, Columbus, with H. H. Sisson in charge, with the title of sales manager. The mine is located at New Pittsburgh, in the Hocking Valley. The output is 600 tons daily.

Bellaire officials of the Cleveland & Western Coal Co. have received orders to place in operation three Belmont County mines owned by the concern. The mines, which are located at Stewartsville, Johnson and Powhattan, have been idle several months. About 750 men were given employment when the operations were started.

Lincoln Mine of the Lorain Coal & Dock Co., which was fired by an electrical wire several weeks ago, is now working 60 per cent, according to James Watson, chief inspector of mines of Ohio, following an inspection. The burning entries have been sealed and it is believed the flames will be extinguished soon. The Ohio mine rescue car Black Diamond was called in an effort to extinguish the fire.

Several conferences between operators' and miners' representatives in the Pomeroy field have been held at Pomeroy with a view of signing up an agreement containing concessions in the cost of dead work, similar to the Hocking Valley agreement made at Logan. The meetings were brought about upon invitation of the Pomeroy Chamber of Commerce. It is likely that an agreement will be reached soon.

Machines for loading coal in the mines made in Pittsburgh are being tried out in a number of the mines in the southern Ohio field, principally by the Essex Coal Co., in the Pomeroy field, and the Central West Coal & Lumber Co., in the Hocking Valley proper. The first-named concern has been using the machines for only a short time and would not venture an opinion as to costs of operation compared with hand loading, but the Central West Coal & Lumber Co. has been operating two machines for 90 days and has ordered a number of others. In case the machines prove successful costs may be reduced to a point where it will be possible to compete with other fields, principally the non-union fields of West Virginia and Kentucky.

Mine No. 25 of the New York Coal Co., located at Chauncey, started operations recently with about 200 men. The Luhrig operation of the same company, employing about as many men, also started operation last week.

## PENNSYLVANIA

Operations have been resumed at the colliery of the Tip Top Coal Co., Mountain Grove, after an idleness of several months. Many farmers from nearby valleys have been given employment at the plant.

Dr. Royal K. Meeker, State Secretary of Labor since Feb. 26, 1923, has presented his resignation to Governor Pinchot, it was announced at the Governor's office Sept. 11. The resignation becomes effective Oct. 15. Dr. Meeker, before taking the State office, had been chief of the scientific division of the International Labor Office of the League of Nations.

The H. C. Frick Coke Co., subsidiary of the United States Steel Corporation, have fired 125 additional ovens at its Phillips plant, making half of the 400 ovens at that place now making coke.

No. 15 colliery of the Lehigh & Wilkes-Barre Coal Co., one of the largest in the Plymouth district, will resume operations this week. Nearly 1,000 men were thrown out of work when the colliery was closed last Monday for repairs. Other operations of the Lehigh & Wilkes-Barre company are working with normal forces, officials state.

The quarterly dividend of the Westmoreland Coal Co. was cut in half when directors declared a dividend of 1 per cent, or 50c. a share, payable Oct. 1 to stockholders of record Sept. 25. In 1917 the Westmoreland company consolidated with the Penn Gas Coal Co. and Manor Gas Coal Co. The old Westmoreland Coal Co., incorporated in 1854, owned all the capital stock of the Penn Gas Coal Co., and with the latter company owned all the capital stock of Manor Gas Coal Co. The company now owns more than 15,700 acres of coal land situated in the Irwin Basin, Westmoreland County. It also owns and operates ten coal-producing mines, with a daily capacity of 15,000 tons. On June 19, 1923, directors declared a quarterly dividend of \$1 per share. The company prior to that time had been paying \$1.25 quarterly. This reduction followed the payment of a stock dividend of 33½ per cent in May, 1923.

### Town Site of Frances Mine, Franko, W. Va.

This newest operation of the Consolidated Fuel Co. is one of the most modern in regard to equipment in the Moundsville district. It comprises 1,671 acres underlaid with the Pittsburgh and Sewickley seams. The mining camp contains seventy houses in all constructed with a view to comfort, neatly painted and generously provided with ground area.



Courtesy Bertha-Consumers Co.



The Cascade Coal & Coke Co., an auxiliary of the Buffalo & Susquehanna Coal Co., put its mines and coke ovens at Sykesville in operation on Sept. 17, after a suspension of three months and will as soon as possible have the entire force of 500 men at work. Practically its entire output is taken by the Buffalo & Susquehanna furnace of Rogers, Brown & Co. in Buffalo.

Buck Mountain, the little anthracite mining town which furnished the smokeless coal which was burned on the Monitor when it engaged the Merrimac in one of the deciding naval battles of the Civil War, is practically a deserted village due to the fact that all fuel mined there now is taken to the Eckley and Drifton breakers of the Lehigh Valley Coal Co. One of the oldest collieries in the anthracite field is located at Buck Mountain.

The Lehigh & Wilkes-Barre Coal Co. has declared a dividend of \$3 on the common stock and a quarterly dividend of 1½ per cent on the preferred stock of the company.

## UTAH

Daniel Harrington, formerly supervising mining engineer with the U. S. Bureau of Mines, has opened an office in the Newhouse Building, Salt Lake City, where he will practice as a consulting mining engineer.

The Utah Supreme Court has ruled that the Utah Fuel Co. had the right to close the road up Miller Canyon in Carbon County. The court held that the coal company was justified on the ground that the road was on its own property. The action against the company was brought by a man who owns a store on the road.

The Sevier Valley Coal Co., Richfield, reports good progress in the development of its properties in Salina Canyon. The company expects to place considerable coal on the market in the near future. Machinery is being installed. It is the opinion of the officers of this company that coal mining will before long be one of the chief industries of this county.

L. F. Rains, president of the Carbon Fuel Co., Salt Lake City, acted as grand marshal in the twilight parade in Salt Lake City on Defense Day.

Utah mines produced 386,192 tons of coal during August compared with 359,527 tons in August of last year. In August, 1922, 498,285 tons were mined.

## WEST VIRGINIA

Although the Kanawha & Hocking Coal & Coke Co. won its suit in the court of Magistrate Hastings, at Montgomery, on Sept. 8 and by an agreement between counsel the one case tried was made to apply to 275 others involving unlawful detainer, nevertheless the company will not be able to get possession of its houses at Harewood, Oakland and Carbondale for a time, as the union has appealed the cases on behalf of the miners to the Circuit Court of Fayette County.

The Chaplin Collieries Co., having mine openings in the vicinity of the Osage plants of the Brady-Warner

Corporation, in the Scotts Run field of West Virginia, has followed the latter company's lead and posted notices that operations will be resumed on the basis of the 1917 wage scale. Although the Brady-Warner Coal Corporation announced a resumption a few weeks ago there has been no actual operation so far.

Output of coal in West Virginia during the fiscal year ending June 30, 1923, according to the annual report of the State Department of Mines of West Virginia, which has just been published, was 87,031,408 gross tons, as compared with 70,888,203 gross tons during the previous fiscal year, the increase amounting to 18.55 per cent. Production of coke amounted to 823,912 net tons as compared with only 145,156 tons during the fiscal year ending June 30, 1922. There were 1,110 companies reporting 1,402 operating mines. The total value of the coal and coke produced together with other interesting figures are given in the following table:

Total value of coal produced (87,031,408 gross tons)...	\$276,759,877.44
Value of coal used in operating (886,455 gross tons).....	2,818,926.90
Value of coal sold local trade and tenants (1,698,205 gross tons).....	5,400,291.90
Value of coal used in coke ovens (1,212,742 gross tons).....	3,856,519.56
Value of coal shipped from mines.....	261,504,139.08
Value of coal mined by small country mines (1,000,000 gross tons)...	3,180,000.00
Total.....	\$276,759,877.44
Value of coal sold (84,932,211 gross tons).....	\$270,084,430.98
Value of coke sold (823,912 net tons).....	5,882,731.68
Total.....	\$275,967,162.66
The increase in value compared with the previous year is as follows:	
Coal.....	\$92,094,061.23
Coke.....	4,856,317.50
Total increase in value.....	\$96,950,378.73
The coal produced was disposed of in the following manner:	
Produced by small country mines	Gross tons
—sold at mines.....	1,000,000
Used in operation of mines.....	886,455
Furnished local trade and tenants from commercial mines.....	1,698,205
Used in coke ovens.....	1,212,742
Shipped from mines.....	82,234,006
Total.....	87,031,408

The Algonquin Coal Co., operating at the head of Widemouth Creek near the Clarks Gap Tunnel, on the Virginian Ry., has been forced into bankruptcy. M. A. Kingsley, of the Kingsley Steamship Co., of New York, is the president and principal stockholder. John B. Rock, of Neal, W. Va., has been named as receiver of the company. It is believed that it will be possible to effect a reorganization of the affairs of the company by issuing long-term bonds in settlement of the claims of creditors.

## WASHINGTON, D. C.

In order to bring together into one administrative unit the related work of the sections of coal and of oil and gas in the division of geology, the old fuel section of the U. S. Geological Survey has been revived by combining the separated sections. W. Taylor Thom, Jr., has been placed in charge of the section on geology of fuels thus formed, with the title of geologist in charge.

## CANADA

Nearly all of the bituminous mines in the Cape Breton area have resumed normal activities. Although no official announcements have been made by the various companies including the Dominion Coal Co., subsidiary of the British Empire Steel Corporation, it is understood the mines are working to fill railway orders, which have been heavy since early in the spring.

The annual financial statement of the Blue Diamond Coal Co., operating in Alberta, for the fiscal year ending June 30 shows a loss from operations amounting to \$75,144, as compared with a profit of \$157,343 in the preceding year. The liabilities for taxes, royalties, interest, etc., brought the total loss up to \$124,950 as compared with a net profit of \$40,732 a year ago.

The city of Montreal has let a contract for 4,500 tons of American anthracite to the Ogdensburg Coal & Towing Co. at \$12.85 per ton. The fact that in asking for tenders American anthracite was specified to the exclusion of importations from Great Britain, aroused a good deal of criticism. L. O. Pion, city purchasing agent, when asked for an explanation, said: "The only reason is that we know of old that American anthracite has done the work required and we do not feel that we should begin experimenting. Until we can be shown that some other coal can do the work for the price we shall have to abide by the old standard."

The Chu Chua Coal Mining Co., with holdings near the City of Kamloops, B. C., is unwatering its workings and expects to be able to resume production this winter. Development is in progress on the property of the Wigham Collieries, which also is in the Kamloops field.

George Watkin Evans, a recognized authority on coal mining, has been retained to examine and submit a special report on the No. 8 mine, Cumberland Canadian Collieries (D), Ltd. This mine was opened, but not extensively exploited and was closed down shortly before the war. Recently a start was made toward unwatering it and Mr. Evans now has been asked to furnish the management with independent advice as to the economic possibilities of the enterprise.

After being shut down for nine weeks after the explosion of July 1 the shaft of the Allan mine of the British Empire Steel Corporation went into operation Sept. 15. Mining has been resumed from the 500 ft. level and Manager Blue expects to raise 600 tons of coal daily and gradually to increase the amount.

Efforts to force the Sydney Mines Council to resign *en bloc* have failed. Representatives of the local Communist organization in the United Mine Workers' ranks sought to force the entire council to hand over the administration of the mining town to the Communist group. This action was taken because the miners charged that the Council was not sufficiently active against the Dominion Coal Co. and the parent concern, the British Empire Steel Corporation.



## Traffic

### Ohio to Test Rate Decisions of Illinois and Indiana Courts

Attorney General Charles C. Crabbe, of Ohio, will take steps immediately to investigate the decisions of Indiana and Illinois courts governing the interstate freight rates on coal in those states, as requested by Governor Donahey in a message to the Attorney General. Mr. Crabbe was unprepared to state whether the Indiana and Illinois opinions would affect the situation in Ohio, but declared that he would give the matter immediate attention and carry it before the Utilities Commission and the Interstate Commerce Commission if necessary.

In a letter to Attorney General Crabbe, the Governor directed the latter to bring test cases immediately in Ohio courts to determine whether the Ohio Public Utilities Commission has authority to fix interstate freight rates on coal shipments and if so decreed, to have the Utilities Commission take such action.

### Indiana Divides on Coal Rates From West Virginia

Approval of plans for an aggressive fight against the petition of the Indiana State Chamber of Commerce asking lower coal rates from West Virginia to Indiana points, was given Wednesday, Sept. 17, by the directors of the Terre Haute Chamber of Commerce. Immediate steps are contemplated to organize all agencies opposing the petition into one concerted effort directed by the Traffic department of the Chamber. This will include the participation of the towns of Sullivan, Bicknell, Clinton, Princeton, Oakland City, Petersburg, Boonville and Linton with the co-operation of the Indiana Bituminous Coal Operators' Association.

The proposed petition originated with influences brought to bear upon the state chamber from the northern section of the state, which consumes vast quantities of coal but produces none. At the time the matter was under consideration the Terre Haute chamber interceded against the filing of such a petition on the ground that it would put an additional handicap and discrimination upon the Indiana coal fields.

### New Lehigh Valley Coke Rates Approved in New York

The New York Public Service Commission has approved new rates effective Sept. 8, 1924, on the Lehigh Valley R.R. for coke (including coke breeze, coke dust and coke screenings), carload minimum weight to open cars 30,000 lb. (except that when cars are loaded to full visible or cubical capacity actual weight will apply, but not less than 35,000 lb.), in box or stock cars 40,000 lb. (rates per net ton) from Harriet to these stations on its lines: East Waverly, Lockwood, and Van Etten Junction, \$2.27; Van Etten to Newfield inclusive, \$2.14; Ithaca to MacDougal inclusive, \$2.02; Cayuta to Burdette, inclusive, \$2.14; Hector to Yale, inclusive, \$2.02; Geneva, \$1.89;

Waterloo and Seneca Falls, \$2.02; Preemption to Naples, inclusive, \$2.14; Oaks Corners, Phelps and Clifton Springs, \$1.89; Manchester to Mendon, inclusive, Rochester Junction to Rochester inclusive, and Rush to Holmes, inclusive, \$1.51; Stafford and Batavia to Longwood Junction, \$1.39; Depew, Niagara Junction and Williamsville, \$1.01; North Tonawanda, 72c.; Niagara Falls and Suspension Bridge, \$1.01; Elmira to Cortland, inclusive, Hanna to Owasco Lake, inclusive, Brick Church to North Fair Haven, inclusive, and McKinney to Half Acre, inclusive, \$2.27; Auburn, Throop and Weedsport, \$2.02.

### Second Hearing Soon on Rate From Nelsonville to Columbus

The second hearing on the complaint brought by the Ohio Collieries Co., attacking the rate on the Hocking Valley Ry. from the Nelsonville field to Columbus, will be held before the Ohio Utilities Commission soon. The rate of \$1.23 is attacked because of alleged discrimination, as the rate into Columbus from the Pomeroy field is the same. The first hearing was held in August, when the Ohio Collieries Co. presented its side of the controversy. The next hearing will be the inning of the Hocking Valley Ry. Co.

## Obituary

**Samuel A. Rinn**, well-known coal operator and business man of Jefferson County, Pennsylvania, died at his home in Punxsutawney on Sept. 15, after an extended illness. He was born in 1860 and began coal mining when a young man. He was long in the employ of the Rochester & Pittsburgh Coal & Iron Co., for ten years having charge of the company's Adrian, Eleanor and Helvetia mines. He was an organizer of several banks in neighboring towns and actively connected with many other public enterprises. In 1892 his private coal interests had become so extensive that he resigned his position with the Rochester & Pittsburgh Co. to attend to them. He was president of the Punxsutawney National Bank and of the Central Pennsylvania Bankers' Association.

## Coming Meetings

**National Safety Council.** Thirteenth annual safety congress Sept. 29 to Oct. 3, Louisville, Ky. Managing director and secretary, W. H. Cameron, 168 No. Michigan Ave., Chicago, Ill.

**Alabama Mining Institute.** Annual meeting, Oct. 7, Hotel Hillman, Birmingham, Ala. Secretary, James L. Davidson, American Trust & Savings Bank Bldg., Birmingham, Ala.

**Illinois Coal Operators' Association.** Annual meeting, Oct. 7, Chicago, Ill. Secretary, C. E. McLaughlin, Fisher Bldg., Chicago, Ill.

**American Institute of Mining and Metallurgical Engineers.** Fall meeting, Birmingham, Ala., Oct. 13-15. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

**American Institute of Electrical Engineers.** Fall convention, Pasadena, Calif., Oct. 13-17. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

**American Gas Association.** Sixth annual convention and exhibition, Steel Pier, Atlantic City, N. J., Oct. 13-17. Secretary, Alexander Forward, 342 Madison Ave., New York City.

**Canadian Institute of Mining and Metallurgy.** Sixth annual Western Meeting, Oct. 16-18, Blairmore, Alta., Can. Secretary, Moses Johnson, Blairmore, Alta., Can.

**Coal Mining Institute of America.** Annual meeting, Dec. 3-5, Chamber of Commerce Bldg., Pittsburgh, Pa. Secretary, H. D. Mason, Jr., 909 Chamber of Commerce Bldg., Pittsburgh, Pa.

## New Equipment

### Will Illuminated Spectacles Replace Cap Lamp?

As is well appreciated adequate mine illumination is one of the most vital problems with which the coal operator must deal today. Some coal producers light their mines electrically from the surface to the working face. Others are content with furnishing electric cap lamps to their men. Such lamps have the advantages that they are entirely self-contained, portable, explosion-proof units, unaffected by the mine atmosphere or the velocity of air cur-



### Heavy Illuminated Spectacles

Current may be supplied by an ordinary storage battery carried on the belt. The eyes are protected from direct light.

rents. To a large degree also they project the light to the point at which the wearer is looking.

Medical practitioners, surgeons, dentists and the like have long employed a head lamp somewhat similar to that used by the miner for throwing a concentrated beam of light to places requiring brilliant illumination. An improved lamp of this kind has been devised by Alford Pimenta of New York City and patented in the United States and England. It is shown in the accompanying illustrations.

This device which might be considered rather as a pair of illuminated spectacles than as a lamp is made in two sizes. The smaller of these will probably prove more applicable to the mines than the larger as it gives a wider field of vision. Ordinary small light bulbs such as are used in hand flash lights are employed in this device and the direction in which the light is projected is adjustable to suit the individual wearer.

The parabolic reflectors with which this device is fitted project the light from each lamp in a powerful ray for as much as 300 ft. from the wearer in the direction in which his gaze is directed. No light from the lamps can enter the eye and as a result the strain upon it is small. Furthermore the eye





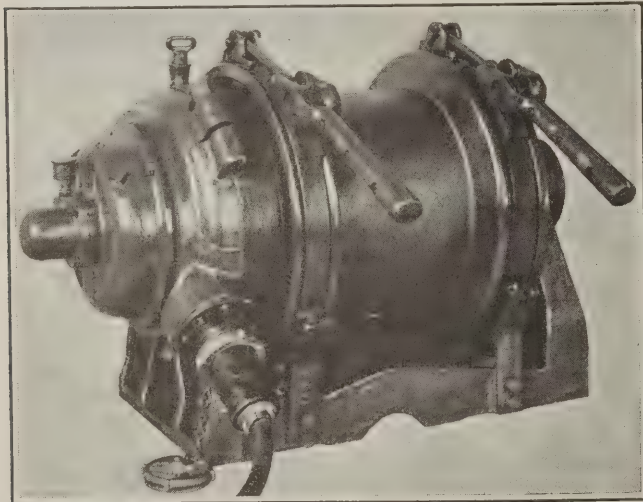
#### Light Spectacle Type of Lamp

When lamps are protected by lenses the light may be concentrated on any point desired.

of the wearer is protected from dust and flying fragments of coal or rock while the light bulbs are protected by thick lenses. The entire device weighs but a few ounces and may be supplied with current from a battery carried on the belt in the ordinary manner. Thus far it does not have any of the devices for breaking the current should the bulb be broken.

#### Can Set Electric Hoist on Timber Floor or Column

A small, compact, powerful, little electric hoist has recently been developed by the Sullivan Machinery Co., 122 South Michigan Ave., Chicago. The com-



plete hoist can be fitted with a 6½-hp. motor and made portable for easy transfer from one place to another. The drum is equipped with extra-heavy brakes. The complete hoist weighs only 480 lb. and has a capacity of 2,000 lb. dead load lifted vertically at the rate of 110 ft. per minute. The base of the hoist is arranged so that it can be mounted on a cross-bar or column, or be bolted to timbers, girders or floor.

The complete unit shown in the illustration is equipped with a 230-volt direct-current motor supported in one end of the frame. This motor supplies power through shafts on ball and roller bearings, to speed reduction gears inside the drum. The single-drum hoist holds 500 ft. of ⅝-in. rope. Double-

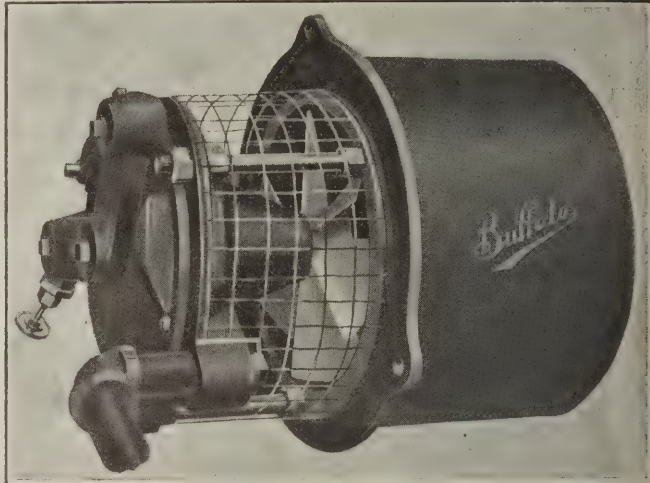
drum hoists may also be obtained having the same general characteristics. The starting box furnished with each hoist is moistureproof and is so constructed that it can easily be hung from a post by means of a spike.

#### Turbo-Blower Delivers Air to Boilers Without Loss

A new high-efficiency turbo-undergrate blower has just been added to the general line of blowers manufactured by the Buffalo Forge Co., Buffalo, N. Y.

#### Turbo-Undergrate Blower

This complete unit is equipped with heavy anti-friction bearings larger than actually required. The blades are designed so as to practically eliminate any backward flow of air.



This device has a six-blade propeller wheel made of aluminum and is provided with a cast-iron housing. When driven at 4,000 r.p.m. the 16-in. propeller wheel will deliver 6,000 cu.ft. of air per minute.

It is claimed that the blades on the fan are designed so as to operate at unusually high efficiency. Where the peripheral speed is lowest, at the hub or center, the pitch of the blades is greatest and is gradually reduced at the tip where the speed is highest. It is also claimed by this design the pressure conditions are more nearly equalized and the backward flow of air near the center of the rotor is entirely eliminated.

A specially designed turbine has been developed for this blower. It has a

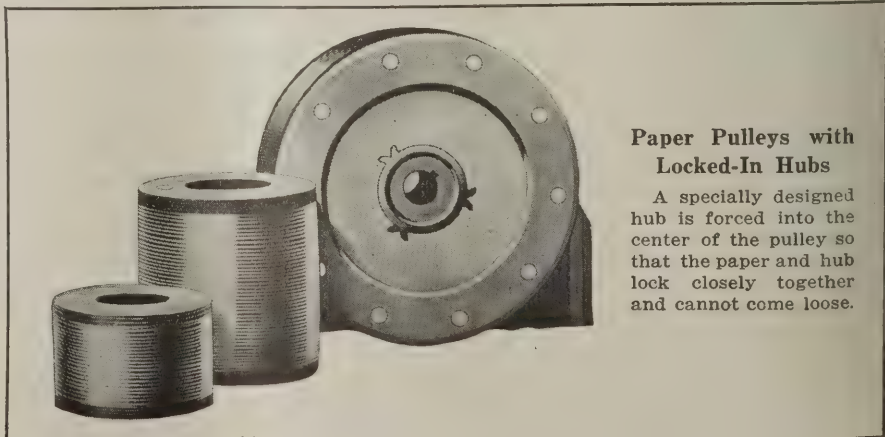
wheel made of monel metal and is mounted in ball bearings. When used with undergrate stokers the complete unit may be connected with a pressure-regulating valve so that the volume of air delivered into the ashpit will vary inversely as the steam pressure.

#### Single-Drum Electric Hoist

This completely inclosed outfit is serviceable in damp places. The motor is inclosed and mounted in the end of the drum which it drives through anti-friction bearings.

#### Paper Pulley with Improved Double-Locking Hub

A new line of paper pulleys having a double-locking hub has just been placed on the market by the Best Pulley Manufacturing Co., 400 Talcott Avenue, St. Louis. The hub of these pulleys has three sets of winged locking grips which prevent the hub from becoming loose even when the pulley is strained under load or suddenly reversed. These ribs are part of the hub and extend through the whole width of the pulley so that when the hub is pressed into position they become an integral part of the pulley itself. Over 2,500 stock sizes of this improved pulley are now being manufactured.



#### Paper Pulleys with Locked-In Hubs

A specially designed hub is forced into the center of the pulley so that the paper and hub lock closely together and cannot come loose.



# COAL AGE

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R. Dawson Hall  
*Engineering Editor*

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## Paying for His Keep

**A**N ELECTRICAL-MECHANICAL engineer employed by a coal-mining company in Illinois said the other day that a few years ago he decided that each month he would try to do something special for his company which would more than pay for his salary.

The success that has attended his efforts shows that there is much to be done in improving conditions at nearly every coal mine. This man's greatest improvements were in realizing savings in operating costs. Needless to say he found himself often in a position where he had to change old methods for new, and consequently had to overcome the inertia of that kind of people who are satisfied to do things as grandfather always did them.

One might be surprised to know that this man was not working for a backward, inefficiently operated company. On the contrary he was employed by a relatively progressive firm, yet he is one of few in that company who want short cuts. He says that it is an easy matter to effect savings in these days when many new and more efficient methods are being introduced to the mining field.

Opportunities for improvements exist at all mines and the day is rapidly coming when mine officials will realize that more engineers of this type will be the profit makers of the future. "One new saving every month" would be a good motto for every mining engineer.

## Square Company Shooting

**C**OMPANY shooting can obviate many difficulties encountered in coal mining. It has been proved conclusively that where company men drill and shoot the factor of safety is raised and the proportion of screenings is lowered. More than one operator in a solidly unionized field has yearned to take over the shooting in his properties and has envied the non-union man who could readily do it without danger of drawing down upon his head the wrath of a powerful labor organization with a bludgeon in one hand and a contract in the other. However, operators who are free to assume complete control of the use of explosives in their mines, as some are doing in Utah lately, need to be temperate in the differentials they fix under contract rates.

It would seem that a differential as high as 30 per cent is excessive and the fixing of it on the theory that it is merely to compensate the company for its share of the expense of mining is deceptive. If it was admitted freely that the level of wages was being reduced in the process and both parties clearly understood this, then the differential should not be questioned. But reducing contract mining rates nearly if not entirely one-third on any other basis is likely to engender bitterness between employer and employee.

Such bitterness is not productive of good for anybody directly or indirectly concerned—except the United Mine Workers of America. That organization would be pleased indeed if most of the operators of Utah, for instance, were to stir up feelings of great discontent among their men. It would then be a most desirable state within which to conduct a vigorous organization campaign and everybody knows the United Mine Workers needs a few more fertile states in which to plant the seed of organization. The losses of territory already have been heavy enough for Mr. Lewis and his associates.

So we feel like cautioning Utah operators who tell their men that contract rates must be reduced one-third in order that the company be barely compensated for furnishing powder, setting shots and firing them. Few farseeing operators there or anywhere else would adopt such a course. Most of them are too honest with their men for that. There are a great many advantages to company shooting and we hope more Western mining companies adopt the practice—but they should play square with their men.

## Coking by Steam

**T**HE quest for a satisfactory method of low-temperature coal distillation has in the past proved somewhat unsatisfactory. High-temperature coking has been brought to a fair degree of perfection, but when an attempt has been made to coke the coal at a low temperature, obstacles have promptly been encountered. Chief of these difficulties has been the excellent insulating qualities of the material treated.

It is probable that the resistance to heat transfer possessed by many substances such as asbestos, magnesia, feathers, felt, fur, wool, wood and the like results from the large number of small air spaces that the material contains. These may be either cellular or interstitial—that is, air may be entrapped within the cells of the material itself or it may exist only between the fibers or granules of the insulating substance. In the first instance the air might be considered as forming an integral and inseparable part of the material; in the second it merely fills the voids between particles.

Air-filled voids in the oven charges have so delayed heat transference that various agitating devices have been employed. Few have proved themselves commercially important.

Within the past few years a medium has been undergoing development that in the future may play an important rôle in the low-temperature distillation of coal. This is highly superheated steam. Today steam is being superheated to temperatures which only a few years ago were considered both impossible and dangerous. No particular difficulty is encountered in imparting to water vapor a temperature of, say, 1,000 to 1,200 deg. F.

Forcing steam of this temperature through a mass of



finely crushed coal in a coke oven displaces the interstitial air and quickly brings the mass to a coking temperature. Experiments performed on coke ovens of this kind show that coke can be made by this means in approximately 2½ hours whereas a much longer period is required for coking by the usual method of heating the side walls. Gas and other byproducts given off from coal coked by steam are readily separable from it by condensation and scrubbing.

As an industry the manufacture of high-quality smokeless fuels from low-quality smoky coals is yet in its infancy. There is little doubt, however, that it is destined to assume an increasing commercial importance as the years go by. Using a superheated vapor to carry the heat necessary for coking to practically all portions of the charge of coal in the oven would seem to open a wide range of possibilities in this direction.

### Mining Engineer Architects

OUR AMERICAN mining villages bear eloquent testimony to the work of the mining-engineer architect, and it is not testimony of which we can be proud. Such a general utility man as the mining engineer can never hope to be an architect, and the company in the Campine, of Belgium, which decided to employ specialized designing talent is to be congratulated on its decision. The town, illustrations of which appeared in these pages recently, bears witness to the advantage of letting the work be done by those who have devoted their lives to that study.

Operators of coal mines should be as ready to seek architectural design and supervision as railroad companies are to employ chefs to prescribe the menus on their dining cars and to supervise the service. Even if a mining engineer shows a flair for architecture, his employers are so doubtful of his ability in that direction that he finds himself unsupported and is driven to follow old-fashioned and unsightly designs. The architect of experience would find his judgment less questioned and would be able accordingly to construct a presentable village. After all, mining towns are for human habitation, and men demand something besides mere utilitarian comforts. They are appreciative of beauty or can acquire that appreciation.

### Indictments

OTHERS than coal men can be indicted—the household, for instance, with a furnace and coal cellar idle through the summer months. Radiators and piping also idle—another economic waste. The consumer's equipment is not 100 per cent efficient. It is working barely 50 per cent of the time. With such a condition of affairs in his home how can the consumer be critical of the coal industry with its 66 per cent efficiency?

We wonder whether the radiators might not during the extreme heat deliver a genial coolness to our habitations and make life bearable. Why should the radiator be restricted to delivering heat when it might be filled with cold air and thus continue to be a source of comfort? The janitor, who in summer months is relatively idle, could have work the year round instead of half the year. In suburban regions he spends his time gardening but in the city he is dismissed unless he has a group of apartments to keep swept and garnished.

Our forefathers shivered in the winter's cold. It

seemed perfectly natural to them. We swelter in the summer. It seems quite the regular order to us. But need it be so? Why not have comfort the year round? The ice industry it is true has aided in making life endurable, but, like the grate fire, it is a partial remedy. We should keep more than our comestibles at a proper temperature.

### Domestic Storage Aids Industrial

SCREENING shortages quite frequently occur during the summer; the price increases accordingly and in consequence the industrial buyer is not encouraged to do his purchasing early. The operator producing a domestic coal cannot afford to crush it so as to satisfy the manufacturer or public utility or to sell it at screening price. Consequently he produces only as much coal of that size as the demand for domestic coal provides.

The only coal that usually can be obtained in unlimited quantity and at the lowest price during the summer is the run of mine produced at those low-volatile mines which do not supply the domestic market. This coal is of such high quality that the purchaser can afford to pay, and is willing to pay, even in years like this, approximately at least what it costs to produce, or in any event he is more ready to do so than when he is buying the screenings at a high-volatile plant.

Consequently unless the buying of the domestic consumer can be hastened so as to extend into the summer the industrial purchases of high-volatile screenings can hardly be greatly speeded, for the latter depend on the former.

Of course there are two slightly different interests in the coal regions. The high-volatile producer, though he objects to the domestic consumer being so opposed to fine coal that he will buy lump coal to break it down with a hammer to fit his stove, finds, however, that in that objection lies his sole opportunity to sell his coal at a profitable price. If the consumer were willing to burn slack, he also could get his coal from the smokeless-coal mines which cannot make lump coal, and the high-volatile producer would be deprived of the most profitable part of his market.

So the demand for the greater use of slack may become ultimately in a sense sectional. The high-volatile producer wants to sell all the slack he produces, and he does not like to be held in any way at fault for degradation of his coal on the way to the market, but at the same time the willingness of the consumer to pay a higher price for a lump coal is the only thing that keeps him out of the bankruptcy court. Consequently if the use of fine coal becomes at all general he will cease to be keen to educate the public away from the larger sizes, for in doing so he may lose his domestic as well as his industrial market.

The high-volatile man always is in a quandary. Either there are not enough buyers of large coal or not enough of small. He wants them both; the purchasers of lump because they are willing to pay him a profit and the purchasers of slack because they prevent him from showing a total loss on that commodity, but if the users of slack call on him heavily in the summer when the domestic consumer is indifferent, he is obliged to turn a deaf ear to them because slack is to him only a byproduct. He cannot afford to make this unprofitable size in order to help the buying-early movement so long as the lump consumer refrains from entering the market.





Street Scene, Kramer.

## Kramer Mine Houses Its Stay-at-Home Employees

Only One Employee in Every Four Lives at Mine—Each Man Requires 4.4 Rooms—Two-Story Houses Accommodate Two Men Each at Cost 32.5 per Cent Less Than Bungalow Type

BY ALPHONSE F. BROSKY  
Assistant Editor, *Coal Age*,  
Pittsburgh, Pa.

**A**UTOMOBILES, good roads and a general rise in the standard of living are creating new housing problems for the American mine owner. Workers who desire a certain degree of independence and the advantages inherent in living in a residential and business atmosphere are willing to pay bigger rents and travel to and from work by auto a distance sometimes as great as 10 miles. This releases the mine owner from the obligation of housing many of his employees. Pennsylvania bituminous miners in this respect are falling in line behind those of Illinois, the procession being led by the anthracite workers.

But with the rise in the standard of living the mine owner is obliged to assume the burden of providing more commodious quarters for those of his men who still choose to reside in the mining towns. He must also give them some of the conveniences found in the larger municipalities and cities. These factors influenced the plans adopted by the Northwestern Mining & Exchange Co. for building a mining town at its new Kramer operation, which was opened in 1920.

The new Kramer shaft mine lies in Jefferson County, Pennsylvania, 10 miles south of Dubois. It is designed for a maximum production of 4,000 tons of coal in 8 hours. About 800 men, including the necessary supernumeraries to fill the places of absentees, eventually will

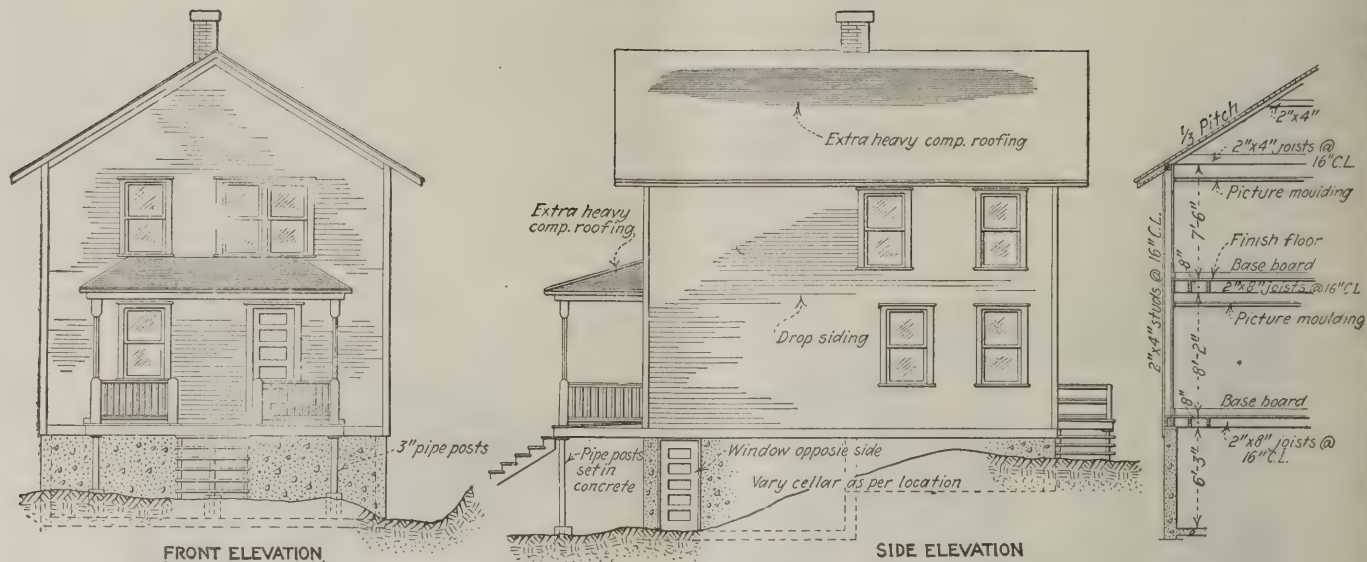
be needed for the operation of this mine. At the present time approximately 300 men are employed in double-shift entry work and on the surface. Early this autumn room work will be started; when this is begun about 500 men will be employed. This number will be sufficient to produce 2,500 tons of coal each working day. As this rate of output, after it once has been attained, will not be exceeded for several years, the company has built a town sufficient to house only those of the employees required to produce this tonnage who do not choose to live in nearby communities.

### ONLY A QUARTER OF EMPLOYEES REQUIRE HOUSING

Observation of the habits and proclivities of miners residing in the field surrounding Dubois, as well as past experience, enabled the Northwestern Mining & Exchange Co. to estimate the necessary initial capacity and the ultimate size of the town of Kramer. Two salient facts thus were established: First, only 25 per cent of the men employed need be housed in company-owned dwellings; second, only 4.4 rooms are required on the average to house each working man and his kin residing in the town. Accordingly, in order to house 125 of the 500 workmen that will be needed to produce 2,500 tons of coal daily 100 houses having a total of 550 rooms have been erected. Practically all these are occupied by company men. Information of this kind is of value only to those contemplating

NOTE—The owners of Kramer mine prefer to erect the two-story six-room houses shown in the headpiece because they are cheaper than dwellings of the bungalow variety. Note how the houses are set in pairs for protection in case of fire.





Front and Side Elevations and a Few Constructional Details

It will be noted that the houses are plain yet reasonably substantial. There are no ornate trimmings, the structure being designed for utility rather than beauty.

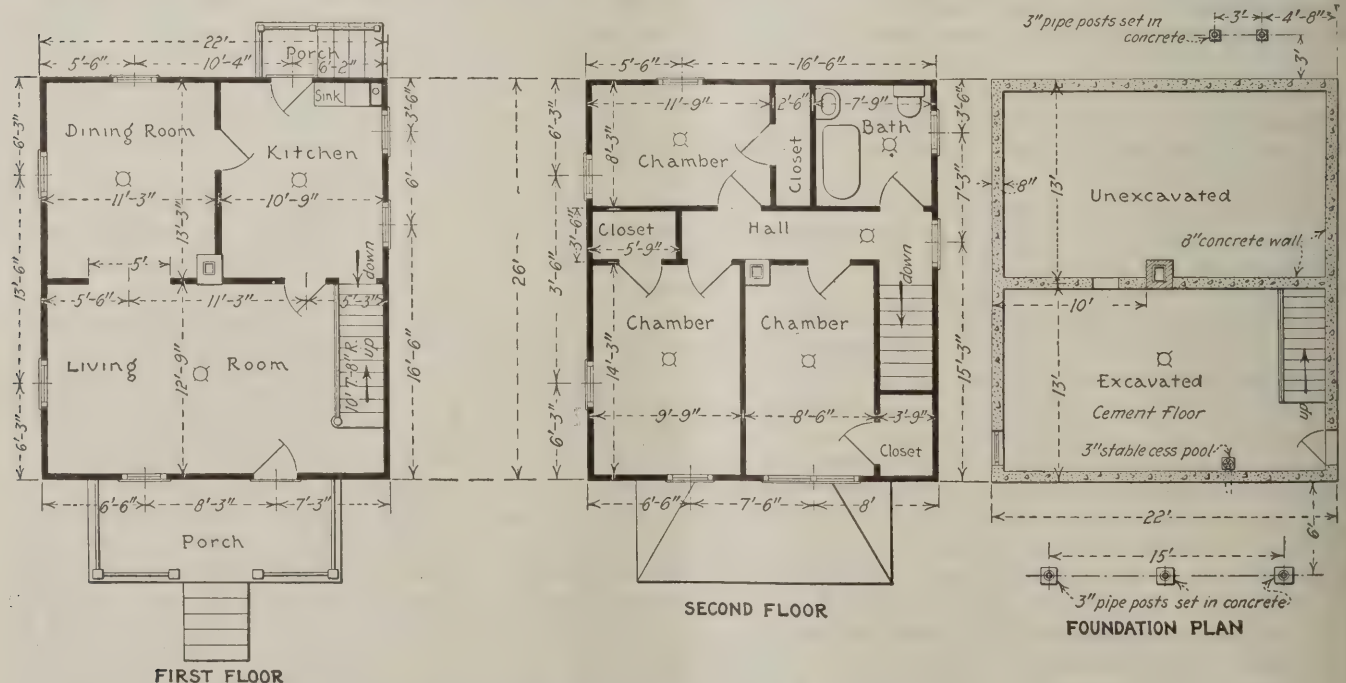
the erection of a town in a mining district connected by satisfactory traveling facilities with established communities.

Of the one hundred houses already built, ten are two-story structures containing seven rooms each. These are intended for occupancy by the bosses and the office force. Fifty two-story houses have six rooms each; this type has proved highly satisfactory, as will be explained later. The remaining forty houses are of the bungalow type, twenty having five rooms and the other twenty having four rooms each.

Before the daily output can reach 3,500 to 4,000 tons, at least 100 more houses will have to be constructed. The company has about decided to make these dwellings two stories high and of the six-room type, conforming in construction to the six-room houses already erected. This type of house probably will be adopted as a

standard, chiefly because it will accommodate an average of two workmen as against one in the case of the smaller dwellings of the bungalow type. The reason for this is obvious when it is considered that the bigger house contains one more bedroom than the bungalow and that the rooms are larger. Married couples with no children may take in as many as four boarders, families containing two or three children may accommodate one or two boarders and large families may occupy an entire house. On the average, each six-room house should shelter two workmen.

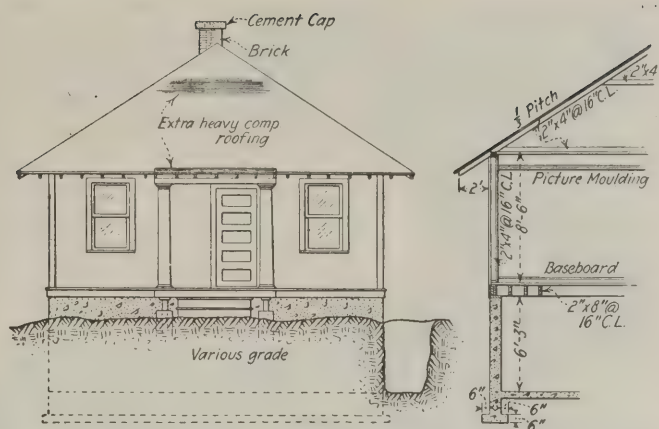
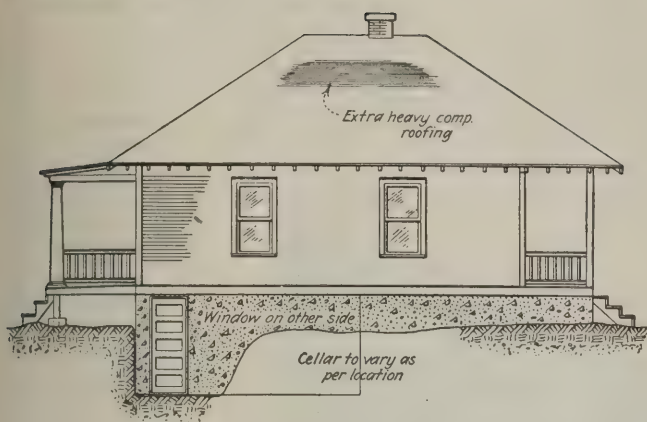
The five-room bungalow is exactly like the four-room type, except for the addition of a small room adjoining the kitchen. In the four-room plan a single room serves as both kitchen and dining room. In the five-room type the additional room can be used either as a kitchen or as a storeroom. Thus, though the



Floor and Cellar Plans for Two-Story Houses

Here again utility is the keynote of design. A large living room together with a good sized dining-room and a kitchen of almost equal size make up the first floor. Three chambers and a bath, together with ample closets are found on the second floor. Half cellars requiring the least excavation are placed under these houses.





Front and Side Elevations, Also a Few Details of the Bungalows

The advantage of the bungalow lies not in its cost but rather in its convenience. So far as the coal company is concerned, however, it cannot allow this consideration to outweigh the housing utility of the two-story dwelling.

larger house is more convenient, it offers no more spacious accommodations than the four-room bungalow. People living in either type are cramped for space and dislike the idea of taking in boarders. The six-room house possesses a further marked advantage in that only three rooms per workman are required as against 4.4 rooms in the bungalow.

#### SIX-ROOM TWO-STORY HOUSES BEST INVESTMENT

As practically the same quantity of material and labor enters into the construction of the roof and foundation in the six-room house as in the four- or five-room bungalow, the cost differential between it and the six-room structure represents only the additional material and labor necessary to the construction between these two extremities. Excavation, foundation and roof construction are items that make up a goodly portion of the total cost. Inasmuch as the cost of the six-room house is only 35 per cent greater than that of the five-room bungalow, the expense of housing a workman in the former is 32.5 per cent less than in the latter. Of course, this calculation is based on the assumption that the occupants of the houses will take in boarders whenever circumstances permit them to do so.

As the accompanying plans and elevations of the several types of houses in the town of Kramer give the layouts, proportions and many of the details of construction, little comment other than a few general remarks is necessary here. The walls are constructed

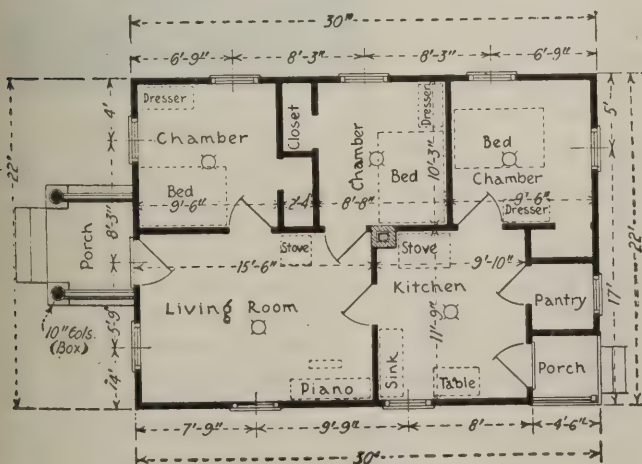
of 2x4-in. studding, lathed and plastered on the inside and drop-sided on the outside. Floors are built of tongued-and-grooved flooring resting on 2x8-in. joists spaced on 16-in. centers. Chimneys are constructed of a single course of bricks inside which is placed 1-in. flue lining tile, the clear opening being 8x12-in. The pier on which the chimney rests forms a part of the center wall of the foundation.

Each window sash contains one large pane of glass in place of four, this latter construction being frequently followed in building miners' dwellings. The large glass is a great convenience to the housewife in cleaning windows. The upper and lower sashes are provided with counterbalancing weights. This is a departure from general practice in this region. It eliminates the inconvenience and breakage caused by falling sashes. These two details might well be incorporated in all miners' houses. Roofs are covered with extra-heavy composition roofing paper.

Foundation and cellar walls are of concrete 8 in. thick. Each cellar is excavated under only half the house area, though the foundation wall extends completely around the building. The half-cellar requires the pouring of a center wall extending from side wall to side wall. When a house is built on sloping ground, the cellar is located under that portion of it where the ground is the lowest, so that the excavation is kept to a minimum. The cellar floors are concreted. Entrance into the basement is gained through an outside door in all except the seven-room houses, which are provided with an inside stairway for this purpose.

All foundation walls were poured with a concrete mixture, the proportions of which were 1:3:5. The coarse aggregate used was  $\frac{3}{4}$ -in. crushed limestone, sometimes termed  $\frac{3}{4}$ -in. screenings. This comparatively small and uniform material facilitates puddling in narrow forms and is disseminated uniformly throughout the wall mass, whereas a heavy aggregate—a 2-in. size was tried—sinks to the bottom.

The utility of the cellars was increased by providing each with a chimney flue so that a small stove might be set up for heating either the basement itself or water for washing. As each cellar is provided with a water faucet and a 3-in. stable cesspool with a bell trap, it can be made to serve either as a laundry or as a place where the miner may change his clothes. Though all houses are provided with running water, only the seven-room dwellings have bathrooms and 30-gallon range boilers or hot-water heaters. Every kitchen is provided with a sink.



Bungalow Floor Plan

The four-room bungalow is laid out similar to the five-room type here shown, the difference between the two being only slight.





### A Bungalow Street

If he has no family or only a small one the miner frequently prefers the bungalow type of house. Many of them, however, prefer a larger dwelling so that they can keep boarders. Kramer is a new town; consequently streets have not yet been graded.

Water for drinking, washing and fire protection comes from a well 220 ft. deep, located near the auxiliary hoisting shaft. Thence it is forced against a head of 240 ft. by a pump having a capacity of 40 gallons per minute to a 20,000-gallon cypress storage tank. The intake pipe to the tank is 3 in. in diameter, and the discharge 4 in. The effective head at points in the town varies from 100 to 180 ft.

It has been observed by officials of the company that the average family living in houses without bathrooms will use about 50 gallons of water daily. On this basis 20,000 gallons of water is sufficient for one day's supply for 250 families (the number that some day must be accommodated in the town) as well as for a proposed bathhouse, the shops and other buildings. By pumping continuously, the tank can be completely filled in 8½ hours.

In case the water-storage tank, for any reason, must be emptied, the pump can be so bypassed as to discharge directly into the 3-in. cast-iron main. This water line is fitted with bell-and-spigot joints caulked with leadite. Twelve fire hydrants are installed throughout the town and so disposed as to afford fire protection to every house in it. These hydrants are of the anti-freezing type—that is, so designed that the water column automatically drains. Loose stone is buried at the base of each hydrant to receive the drain water.

As an added protection against the spread of fire,

houses located on adjoining lots are set in twos with an extensive open space between each pair. Lots have 50-ft. fronts and are 100 ft. deep. Streets are 40 ft. wide with a 20-ft. alley midway between each two that are parallel. Front building lines are 20 ft. back from the street lines. A plan that has worked out to advantage in this village is that of separating the town into two sections, one for people of American birth and the other for foreigners.

From the water mains a 4-in. tap line is run to each pair of houses. On each of these tap lines close to the main is inserted a corporation cock for shutting off the water supply to the houses served, in the event of a leaky pipe or other accident. Adjoining the corporation cock an 18-in. lead gooseneck is inserted in the tap line. This gives flexibility to the connections and prevents a break, should either the tap line or the main settle below the levels at which they were first laid. Two house lines, of course, are connected to each tap line, one to each of a pair of houses. In each of these branch lines is placed a stop-and-waste cock for drainage purposes.

The town has been built on a flat-topped hill covered with loose surface material of a broken and sandy nature. This gives natural surface drainage.

Two complete sewer systems have been installed. One is of the surface or open type and handles waste water from the four-, five- and six-room houses. It provides a quick run-off for surface water after a heavy rain. The other is of the sanitary or closed type, intended for handling waste water and fecal matter coming from the ten houses equipped with bathrooms. Each system, of course, is independent of the other.

The surface-sewer system, which cares for ninety of the one hundred houses, thus far constructed, is laid



### Kramer Water Tower

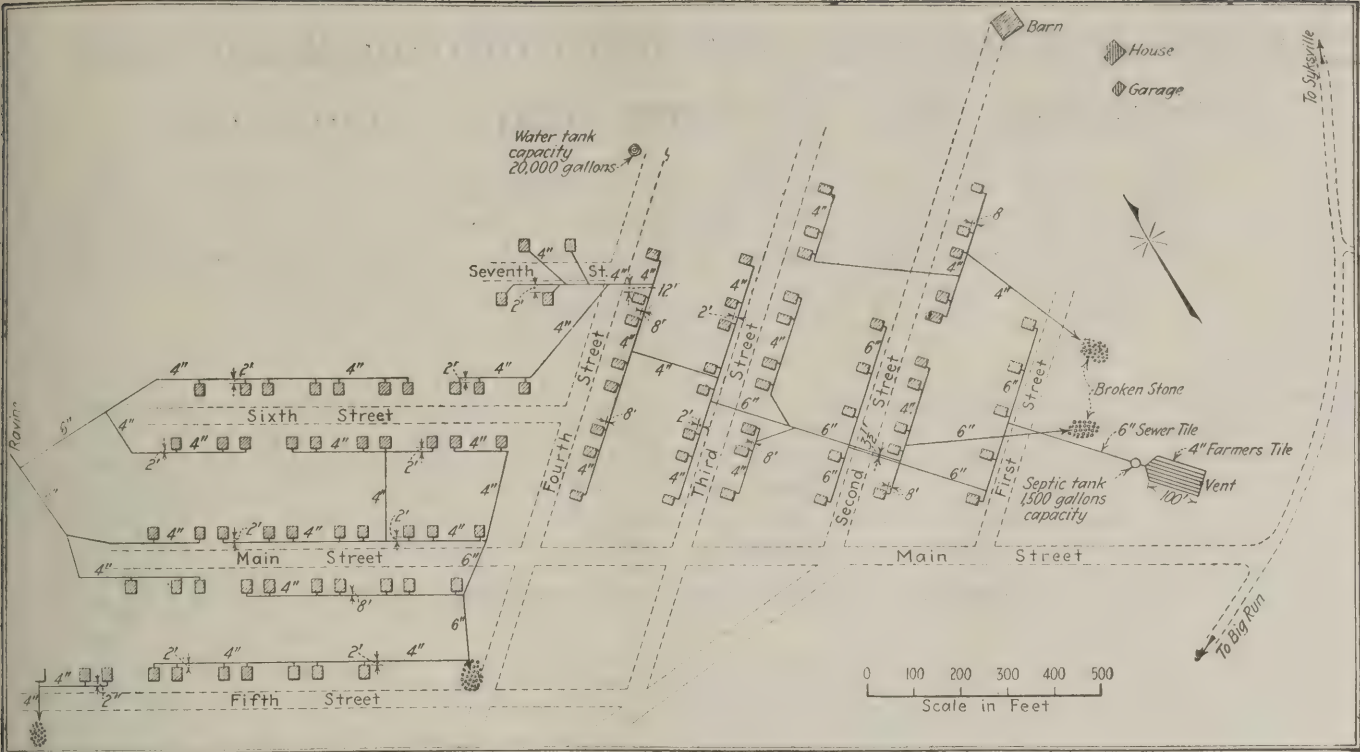
Even a small mining town must have a dependable supply of potable water. Elevating a tank upon a tower as here shown provides not only water storage but also an ample head for fire fighting.



### A Bungalow Front

Round porch columns are more expensive than square ones but add greatly to the appearance of the structure. The weight of the porch is supported by 3-in. pipe columns footed on small concrete piers. This is a detail conducive to low maintenance.





Map of the Town Showing the Two Sewage Systems

Two distinct systems of sewage disposal are here installed. One serves the houses provided with bathrooms and the other those not so provided. One system discharges to a septic tank and the other to surface disposal.

on the main streets with 4-in. terra-cotta pipe and connected to the houses through 3-in. pipe of the same material. These tile are set below the frost line. Waste water, not absorbed by the loose ground in which the open-joint sewers are buried, runs by gravity to the discharge point located in a ravine some distance from the town.

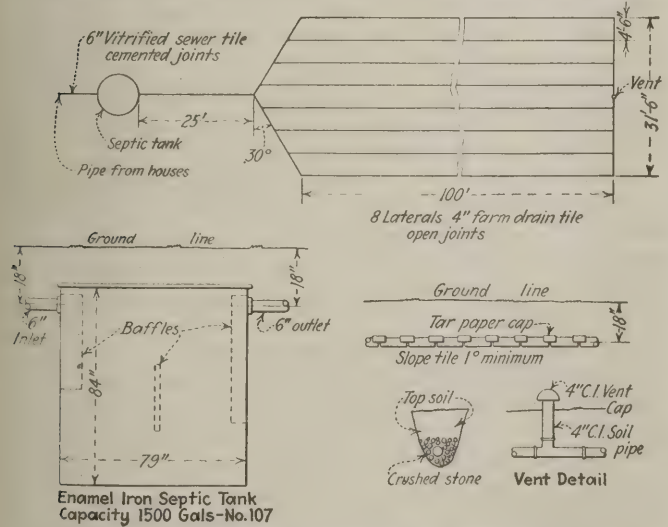
Sewage from the ten seven-room houses on the sanitary system is carried away in 6-in. sealed-joint terra-cotta pipes laid on a 3-per-cent gradient to a central septic tank. The capacity of this tank is 1,500 gal. All joints in this sewer line are sealed with a mixture of one part sand and one part cement.

Outside toilets are provided for the tenants occupy-

ing the houses not equipped with bathrooms. Two toilets and two coal bunkers are built under the roof of one outhouse serving each pair of houses. The two toilets surmount an open concrete vault.

It is now the belief of the company that it would have been to its advantage to install only one sewage system, and that of the sanitary type. Aside from all considerations of sanitation, the closed sewer system which discharges into a septic tank involves a lower maintenance cost.

All streets in the town are lighted with 75-watt lamps. A 2,300-volt circuit is carried from the mine plant to the center of the town, where it is stepped down to 110 volts by being passed through two 15-kva. transformers. This furnishes lighting current to both streets and houses.



Simple System of Sewage Disposal

After passing a septic tank the sewage flows to a system of drain tile, through which it percolates to the soil. The tile in this case acts as a filter for a liquid already purified by the septic tank.

In a recent lecture on the industrial uses of nickel, aluminum bronze and other non-ferrous alloys, delivered before the Institute of Metals in London, says the *Colliery Guardian*, W. M. Corse stated that the production of nickel was largely confined to the British Empire. The bulk of this metal is used in steel manufacture. The outstanding characteristic of aluminum bronze is its resistance to corrosion, although it possesses hardness and strength to a high degree. Curiously enough, it was stated, however, the largest single use for this alloy was for the manufacture of a worm wheel for Ford trucks, for which purpose 11,000,000 lb. had been bought during the past few years. The service records of these gears indicated a low percentage of breakage and a long life. Important work is being done both in Great Britain and the United States on stainless iron and stainless steel alloys, which contain nickel and chromium, and much is expected from experiments now in progress.



# Care in Choosing and Maintaining Fuse and Switches May Prevent Many Accidents\*

Keep Fuses in Fireproof Cabinets—Automatic Circuit Breakers of 2,000-Amp. Capacity or Over Should Be Remotely Controlled—Each Phase in a Three-Phase Circuit Should Be Provided with Separate Fuses

BY J. F. MAC WILLIAMS

Power Engineer, Pennsylvania Coal & Coke Corporation,  
Cresson, Pa.

**F**USES for electrical circuits may be divided into several classes. Link fuses of the open type should be used only when mounted on non-combustible and non-absorptive material. It is always preferable that they be installed in fireproof cabinets. This type of fuse is exposed, and consequently the probability of a short-circuit or injury to anyone working around the fuse or making a renewal is always imminent. The only advantage that this fuse has is that it is relatively cheap.

Inclosed fuses of the plug type are much safer than link fuses of the open type, but even these fuses may be misused and thus prove ineffective. It is a common practice for some men to insert a piece of metal about the size of a penny in the base of the socket and thus make the fuse inoperative. Whenever this type of fuse is used the line wire should be connected to the center contact and the load wire to the threaded part. If this is done the circuit becomes dead the instant the fuse is turned loose from the bottom or line contact. In consequence it is much safer for the workman who has to handle it.

The inclosed type of cartridge fuse also is safer than the open-link type, and when provided with ferrule contacts may be used on circuits carrying currents as high as 60 amp. When equipped with knife-blade contacts the fuses are suitable for use on circuits carrying much larger currents. Some of these fuses which have renewable links may be misused to carry a higher current than that for which they are designed. Even non-renewable cartridge fuses often are tampered with and made inoperative or fused to limits much higher than those for which they were designed by jumper wires being connected between the two terminals.

The inclosed externally operated fuse switch probably is the safest for general work. To renew the fuse the terminals are first of all entirely disconnected from all live parts. The Underwriters' classification of this complete unit is A.A.

Whatever type of fuse be used on a circuit it is always necessary that it be installed and maintained

properly. If this is done few accidents will occur. When renewing fuses in grounded cabinets care should be taken to avoid short-circuits or accidental connection with the ground. All contacts should be kept clean and in proper alignment; otherwise excessive heating may occur and cause serious damage.

Automatic circuit breakers will afford much better protection to apparatus than almost any type of fuse. Usually these breakers are designed so as to trip at any current value between certain limits for which the breaker has been made. Such breakers should be installed high enough from the floor and in such a position that neither the operative nor any inflammable material will be exposed to the arc which rises from the contact tips when the breaker opens.

They should be equipped also with a hand trip properly insulated and in such a position that the breaker may be readily opened manually without injuring the operative's hand or arm or exposing him to the arc. Such a breaker should always be set to trip at a current value much less than that which would cause injury to any connected apparatus or cables. Automatic circuit breakers used for interrupting currents higher than 2,000 amp. should be remotely controlled so as to avoid possibility of danger to the operative if any part should fail when the circuit is being opened.

Automatic reclosing circuit breakers, if installed outside the power plant or substation, should be inclosed in a locked fireproof box to prevent anyone tampering with them. The key should be placed in the hands of a responsible person, familiar with electrical equipment.

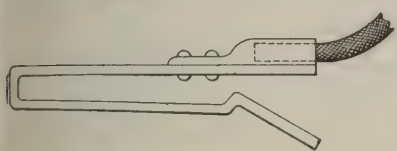
This type of breaker is designed so that it will close just as soon as a short-circuit or overload has been taken off the line. Therefore, great care should be taken to avoid shock or burns. To obviate danger when repairing such a switch, or feeder wires connected to it, the control circuit should first of all be opened and the circuit grounded. Unless this be done the workman might begin to work on either the circuit breaker or one of the feeders when the power is off and later the circuit breaker might close, giving him a severe shock or burn.

\*Article entitled, "Electrical Starting Devices," read Oct. 2 before the Mining Section meeting of the National Safety Council, Louisville, Ky.



If circuit breakers are properly installed and maintained the danger of burning out generators, motors or cables and injury to attendants will be reduced greatly. Automatic reclosing circuit breakers may be installed so as to sectionalize feeders and trolley circuits and thus localize any trouble. They also have another advantage in that they may be adjusted so as not to close on any load which would be injurious to the generating or converting equipment.

There are many types of so-called safety switches.



**Busbar Grounding Terminal**  
A clip like this may be easily slipped over a busbar and connected to a good ground.

position when the switch is closed. This handle has a socket at the end which must be entered into a slot in an extension at the lower right-hand corner of the box. The shaft operating the switch is protected by this extension so that it cannot be operated with a wrench or plier. A lineman wishing to work on the circuit controlled by this switch opens the switch and unlocks the handle, which he takes with him. In this way he is assured that no one will close the switch without his knowledge.

Oil switches often are required to open circuits carrying currents much larger than those for which the switch is designed. The oil in these switches is provided in order to prevent arcing when the current is interrupted. These arcs carbonize the oil, thus reducing the insulating characteristics and possibly causing trouble. Dust and dirt also enter the tanks and in many cases form conducting material.

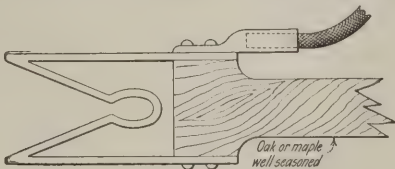
**KEEP OIL USED IN SWITCHES CLEAN**

Whenever an arc is broken under oil the oil dissipates some of this heat and itself becomes heated. This causes an expansion of the oil, expelling a certain quantity of air from the tank. When the oil cools and contracts, new air enters the tank. If this air contains moisture, which it nearly always does, fine particles of water vapor form on the sides of the tank and drop into the oil.

If much moisture and dirt is permitted to collect in the oil and tank, a heavy arc may cause the switch to explode. Switches of this type with vertical contact boards permit dust and dirt to drop into the tank rather easily, whereas horizontal boards prevent a large part of the dust from getting into the oil. Dust and dirt collect on the outside of a switch owing to the presence of oil, which holds any particle of dirt which comes in contact with the switch. Common dust and dirt in this manner form a conductor between the switch terminals and often cause leakage of current to ground or from one line wire to another.

To avoid accidents it is therefore necessary to keep the switch as clean as possible and make periodic

One manufactured by the V. V. Fittings Co. appears to give satisfaction. This switch is enclosed in an iron box and is provided with a curved operating handle locked in



**Pole-Mounted Clip**

Because this grounding terminal is mounted on an insulated pole there is little danger to the workman even should he attempt to place it on a "live" conductor.

inspections of all the current-carrying parts and also of the oil. Sludge in the bottom of an oil tank may become so deep as to cause current to leak from one of the line wires to the ground. If the switch is not grounded the tank and supports will become charged and dangerous.

How often the oil should be changed depends on the service which the oil switch is required to perform. It may be necessary to change it every month or only every few years. In dusty damp places it may need renewal every few months. In dry clean places it may be necessary to renew the oil not oftener than every four years. No general rule can be formulated, as the time will depend on the location and severity of the service. Every oil switch should be inspected at least once a year. If the contacts are damaged they will, of course, increase the probability of accidents.

**FREQUENT INSPECTION SAVES TROUBLE**

At the mines of the Pennsylvania Coal & Coke Corporation, unless a switch has been in abnormal service, it is inspected once a year. If moisture or sludge appears in the tank it is cleaned out, the contacts adjusted and the oil entirely renewed. Any oil which appears to be satisfactory is tested before it is used. Oil that appears to be good often is found, upon further inspection and test, to be unsuitable for use until filtered. For this purpose a pressure filter press is used.

New or filtered oil must not break down at any lower voltage than 35,000 when tested between sphere gaps  $\frac{1}{2}$  in. in diameter and set 0.15 in. apart. The flash point should not be lower than 171 deg. C. and the fire point not less than 178 deg. C.

Graded-resistance types of motor starters are used on both alternating and direct-current circuits. These starters have a number of contact points or small switches which must be periodically inspected. Perfect contact should be made at each point to obtain results.

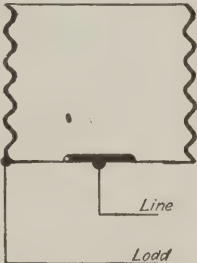
Most of these starters are provided with a blowout coil for preventing serious arcing. These coils must always be kept in good condition; otherwise they will not function properly, and serious damage may result. When shutting off the current with this type of controller each contact should be broken quickly; unless this is done, the controller cover may be blown out under severe conditions, and the operator injured or a fire result.

A compensator is a combination switch and transformer and is therefore subject to the same dangers as already mentioned and should be protected and cared for in the same manner as other switches.

The wedge-type contacts make a more perfect connection than other types and consequently greatly reduce arcing.

When properly designed and maintained, automatic motor starters are the safest equipment to use for starting motors. They can be located where there is little danger of fire or accident to the operator and can be made to perform their duty accurately each time they are used.

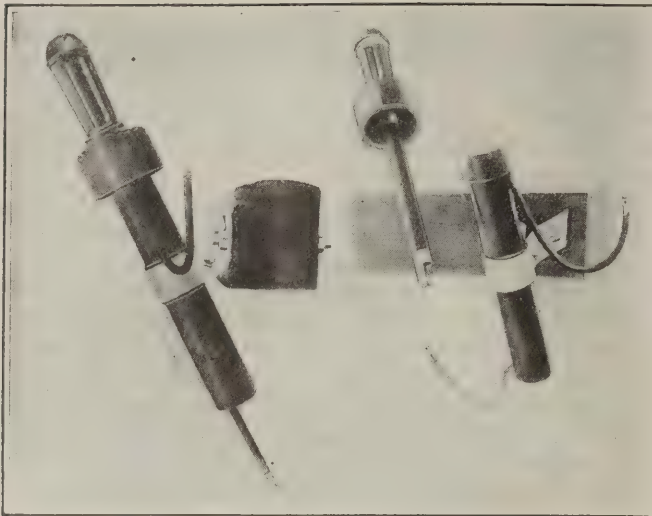
If six motor leads were brought out of delta-connected induction motors each phase could be protected independently by six fuses or relays. With this



**Fuse Socket**

Just as soon as the fuse is partly unscrewed it becomes "dead" if the line and load are connected in this manner.





**This Fuse Is Efficient, Safe and Readily Mounted**

An efficient fuse suitable for outdoor service is important on any outside electrical circuit, but more especially is it important that it should be so constructed that it will not be ruined the first time it is called upon to function. Frequently one disturbance quickly follows another, and if the line is left unprotected after the first accident due to the breakdown of fuse apparatus the result may be disastrous.

arrangement better protection could be afforded the operative and equipment.

Line fuses always have been a great source of trouble and danger to power users and power companies. The Pennsylvania Coal & Coke Corporation has found, after several years' experimenting with many different types, that the Schweitzer & Conrad Type E ejector cutout, though perhaps more expensive than others, gives satisfactory results. This fuse is simple and compact; the fuse element proper consists of a strip of high-resistant high-tensile strength fusible wire which is held in tension by a coil spring. The fuse is provided with slots for quick insertion under terminal screws and enclosed in a cork which protects it from corrosion and also acts as an arc barrier. The cork itself is enclosed in a tube, so there is little possibility of the fuse being affected by external atmospheric conditions. The complete operating mechanism is enclosed in a bakelite tube which is screwed to the operating handle. Current passes from the base of the coil spring to the fuse element through a flexible copper cable. This cable shunts the spring, and therefore the current in the spring is negligible.

#### SPRING BREAKS HEAVY CURRENT ARC

When the fuse link is broken from any cause whatever, the spring contracts and introduces a long gap between the two fuse ends in the tube. This quick and positive rupturing feature is assisted by the barrier effect of the cork. The result is that if the fuse operates on an overload barely sufficient to melt the fuse link, a positive break is obtained. In case of a short-circuit, the cork is ejected by the explosive action of the arc, and besides acting as a barrier it helps to interrupt the arc by sweeping it out of the fuse tube.

The whole fuse outfit is mounted on a crossarm at such an angle that any flame or gases escaping from the open end at the bottom are directed away from the lineman. A new fuse is put into position by a quick motion. This is important if the operator is closing the circuit on an extremely heavy load.

If oil switches were designed so that it would be necessary to open the switch before a short-circuit or

ground could be applied, a great step toward protection of the operative would be accomplished.

In the short-circuiting and grounding-compartment type of switches, the ground connection should be made first. If the doors on the compartment are hinged at the top they should not be removed but swung forward sufficiently that the operative will be able to reach by them and apply the connection to the switch. By this procedure the door will act as a barrier in case the switch is charged.

When men are working on lines the conductors should be grounded and short-circuited. The ground connection should be made first and the short-circuiting devices applied afterward. This should be done whether the work is to be performed inside the plant or outside on the line. The apparatus for this work should consist of flexible cable of a size not less than No. 6 having for station work a clip, which hooks over the ground bus and locks in place.

On the other end of the cable a set of spring clips fitting the contacts of the line terminals and mounted on wood handles should be used. For grounding outside-line wires a piece of  $\frac{3}{4}$ -in. pipe not less than 5 ft. long with a connection head on one end and a point on the other should be used. A clip similar to that mentioned above, made of copper and mounted on wood handles, should be used for attaching to the line wires.

#### DANGERS ARE LESSENERED BY GROUNDS

Ground connections should be made to provide safety to equipment, to discharge abnormal potentials and to afford a path for current leaks from equipment. Such means will reduce the hazards accompanying the operation of electrical apparatus. Sometimes it is not feasible to ground electrical apparatus, and often by doing so the hazards to the operator are increased rather than decreased. In any case, the grounding of equipment, supports, etc., must be understood to be done for the protection of the operative from shock should these parts become charged. Grounded-frame parts actually increase the danger of shock to the operative should he make contact between current-carrying parts and grounded-frame parts. All ground connections should be tested occasionally so as to be sure they are always effective.

A low-voltage release with short-time limit will be found preferable to the no-voltage release when equipment may be subjected to severe shock by a sudden restoration of normal voltage. The short-time limit prevents the complete interruption of service if the drop of voltage and its return is rapid.

Linemen always should use line protectors such as line hose, tie caps, rubber pigs, etc. These men also should use transformer-fuse pullers whenever they are required to remove or install fuse plugs on transformers which may be either heavily loaded or in damaged condition.

#### PROVIDE WORKMAN WITH TESTER

Some simple form of tester for determining whether the line wires are charged often has prevented serious injury to persons required to make repairs. A simple and cheap tester, called the Pocket Electroscope, that can easily be carried, is made by the Minerallac Co. of Chicago. It is the practice of the Pennsylvania Coal & Coke Corporation to furnish its men with this instrument.



Welders should be provided with lenses of suitable quality for protecting the eyes. Such glasses should give maximum protection against ultra-violet and infra-red rays. Combinations of red and blue, or red and green glasses give fair protection, but we are using at present a metallic glass which appears to give our welders less trouble than other glasses. Frames for helmets should be made of a material which will not conduct heat or light. To avoid danger of burns operatives should be required always to use asbestos gloves and aprons.

Rubber gloves should be subjected to a mechanical test. Any 2-in. section of the rubber should stretch to 6 in. without injury. All gloves not used in conjunction with an outer protecting cover should be at every point at least 60 mils thick. Gloves used with outer protecting covers should not be less than 50 mils thick. Variation from these thicknesses should not be more than 15 per cent. An air test for punctures in gloves is easily made by rolling the glove from the cuff toward the finger tips. By moistening the glove, leakage at any point can be easily observed. When immersed in, and filled with water, all gloves when tested with 10,000 volts for 2 minutes should show no leakage in excess of 10 milliamperes.

#### ELIMINATE FALSE IMPRESSIONS OF SAFETY

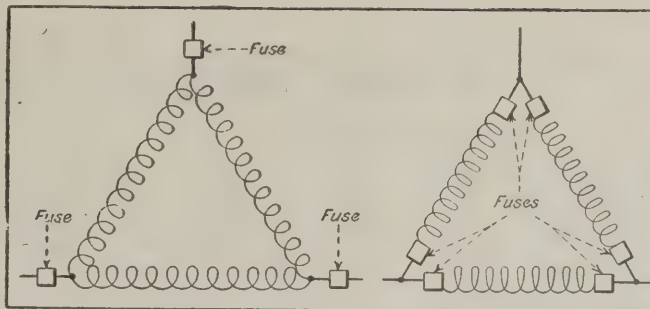
In laying out a new wiring installation all conductors should be arranged so as to indicate to the workmen the pressures of the different wires. Colored cables and conductors, also insulators and supports, may be used to indicate the pressure of the conductors. Where many different circuits are laid out together it is sometimes possible to arrange those conductors carrying the highest voltages in places where they will be safest. In some installations it may be possible to locate conductors carrying high voltages on the uppermost arm or rack.

When using insulated wires it is well to use only conductors having an insulation which under nearly all conditions could never become dangerous. If this cannot be done, bare wires should be installed, as they can in no way convey to the workmen a false idea of security. Many people have been injured by mistaking weatherproof for insulated wire. These accidents probably would be much less frequent had the wire been bare.

All cable sheaths and conduits carrying conductors should be grounded. Metal tags may be placed on cable sheaths indicating the voltage carried by the conductors, and end bells or potheads should be plainly marked. All cables or wires should receive a test of two and one-half times their working pressure soon after being installed.

#### PUT DANGEROUS APPARATUS OUT OF REACH

It is hardly necessary in these days to install a switchboard having any parts at the front of the board carrying high-voltage circuits. It is wise to use rubber matting if proper care is taken of it—that is, if it is kept clean and dry; otherwise it may become a menace. Wooden platforms, in my opinion, are dangerous. It is easy to stumble over them; they absorb oil, and if not carefully made the nails or screws in them may easily defeat their purpose. Any device installed as a safeguard is more dangerous than nothing at all if it is defective, as the attendant is misled into thinking he is safe when actually he is in great danger.



#### Do We Fuse Three-Phase Circuits to the Best Advantage?

The figure on the left shows the usual method of fusing three-phase systems. Fuses of smaller size which will respond to conditions in each phase may be used if inserted as shown in the figure on the right.

All switches should be opened and closed as quickly as possible, and the blades and contacts should be perfectly aligned so that this may be done. Otherwise there may be serious arcing.

Switch handles should be strong and well insulated. Fiber guards should be provided to prevent switches being closed on circuits which should be left open. Any switch connected to a circuit where there is a possibility of any flashing should be provided with barriers of non-absorptive and non-combustible material. In general, disconnecting switches on 2,200-volt circuits or higher should be provided with such barriers.

Arcing horns for taking up surges, flashovers and overloads should be installed so that neither the operative nor equipment will be in danger when the horns come into action. They should be installed only in places where the arc will not cause damage to overhead equipment. If located in a low position or near other apparatus, side barriers should be installed. The horns themselves should have sufficient spread so that any arc passing along them will be quickly interrupted.

Almost any expense incurred in making electrical equipment safe is a good investment. Where operators feel secure from shock or other accidents, better care usually is given to it, and it is better operated. By eliminating dangers to the equipment and also to the operatives, much expense occasioned by delays and damage is obviated.

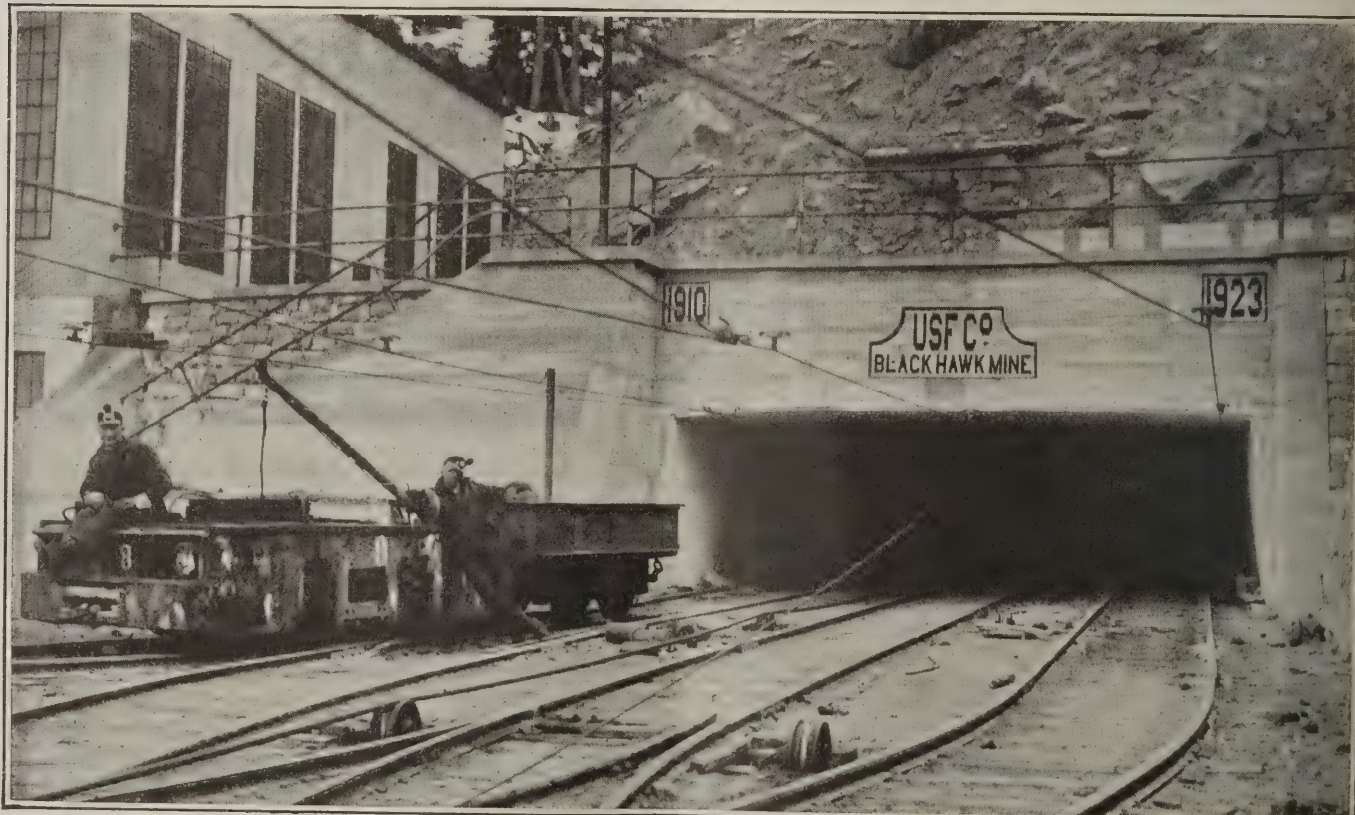
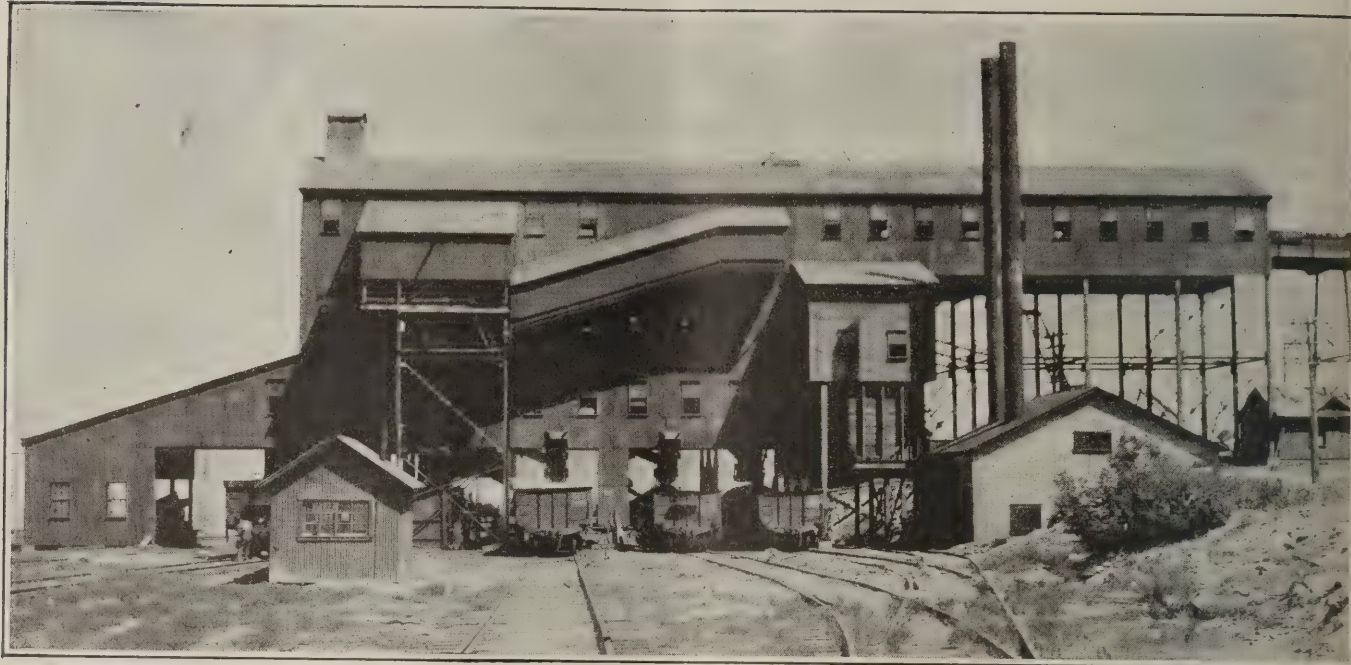
#### TAKE PRECAUTIONS BEFORE ACCIDENTS OCCUR

Any reasonable expense incurred when endeavoring to select good electrical equipment for almost any job may easily be justified over a period of years. However, it is also important that the apparatus be installed in the best approved manner. Too often do we see expensive high-grade equipment purchased for a mine and either left unused until it is badly rusted or else it is installed in a careless way. It is not sufficient for the mine officials to merely appropriate large sums of money for the purchase of electrical equipment. The expenditure of such money is justified only when the apparatus has been properly installed and is truly effecting the savings originally claimed for it.

Workmen should be taught the essential details of the equipment they are called upon to operate or maintain. With a perfect knowledge of the function of each coil, relay or contactor the operative will not attempt to use electrical devices which when in disrepair increase the hazards to himself and others. Most accidents are due to ignorance or carelessness, therefore, safety precautions should be started, not when an accident has occurred but before equipment is purchased or installed.



## A Mine That Is One of the Showplaces of Utah



### Black Hawk Mine Portal and Tipple Operated by United States Fuel Co. at Hiawatha, Utah

This mine is generally considered the principal operation of the company. The mine operates in a seam of coal 28-ft. thick and is capable of producing nearly half a million tons annually. More than 300 men are employed when the mine is in full blast. Every safety precaution applicable in Utah is used in this property. Its mine equipment and methods are such that they grip

the attention of any visitor, as might be suggested by the massive concrete portal and three-track main haulage shown in the picture. The mine opening is a drift high in the side of a mountain. Trips are hauled to the portal by motors and let down the hill by tramway to the five-track up-to-date steel tipple illustrated at the top of the page.



# Coal Seams of Alabama—Their Output, Analyses, Ash-Fusing Point and Geologic Structure

Steep Pitches, Thin Seams, Faults and Large Partings  
Frequently Make Operation Difficult but Some Beds Are Clean  
and Flat—Coking Coal Will Suffice to Smelt All Iron in Field

BY MILTON H. FIES

Vice-President, De Bardeleben Coal Corporation,  
Birmingham, Ala.

**P**IG IRON was manufactured in Alabama many years before the mining of coal. Iron ore and red-cedar charcoal were used for that purpose. Tradition says that Alabama iron was used to shoe the horses of Andrew Jackson's soldiers. No coal was produced until 1830. In that year it was mined in Tuscaloosa County, in the vicinity of what is now the University of Alabama, and shipped on flat boats—obviously during the wet season, for there were many shoals—down the Warrior River to Mobile.

About that time the first railroad, the Decatur & Tecumseh, was being constructed in northern Alabama to overcome the obstructions to freight traffic caused by the now well-known Muscle Shoals in the Tennessee River. This railroad was patterned after a railroad at Mauch Chunk, Pa., which was used for hauling anthracite from the Panther Creek Valley. The Alabama railroad, which required about four years to complete, was forty-six miles long and was used solely for the transportation of cotton. Although it was a failure, it demonstrated the practicability of the undertaking, and the succeeding railroads, which were begun in 1834, 1848, 1852 and 1853, added immeasurably to the development of the coal resources of the state.

Between the years 1830 and 1860 practically all the coal mined in the state was dug from the outcrop near the river or from the river beds and shipped by boat to Mobile. The transportation of coal down the Warrior River was a risky proceeding, required much skill and frequently was accompanied by heavy losses. It is recorded that this coal was sold to the gas company in Mobile in 1844; it probably was mined from the Black Creek seam.

In 1914, on the completion of Lock 17, the Warrior River became a navigable stream from nine miles above Cordova, Ala., to Mobile. It offers a great opportunity for the future development of the coal resources of the state.

Coke for foundry use was first made in Alabama in 1855. It was twenty-one years later, however, in 1876, that pig iron was made from Alabama ore with Alabama coal.

Coal and ore mines in Alabama during the "War between the States" aided the South materially and caused great concern to the federal government until federal troops, in 1865, captured the iron works and coal mines. This war awakened the nation, and the South especially, to the possibilities of Alabama's resources. Since that time, notwithstanding difficulties and obstacles, the growth has been most marked.

The perfection of the process of the manufacture of open-hearth steel from Alabama pig iron, on Thanks-

giving Day, Nov. 30, 1899, marked the beginning of substantial development in Alabama. The production of coal for the twenty-four years 1900-1923, inclusive, was 355,583,769 tons; the production for the preceding twenty-four years was 74,329,369 tons. To the perfection of the open-hearth process no small part of this increase is due. After the consummation of this process large producing companies that were making pig iron began comparing the coal and ore resources and, in the main, adopted the policy of withdrawing coal from the commercial markets.

## COAL SEAMS MAINLY OWNED IN FEE

The coal seams in Alabama are owned mainly through fee or mineral rights, although a number of operations pay a royalty on the coal they mine. The royalty paid varies from 5 to 7c. per ton on the low-grade high-ash coals to 15 to 20c. per ton for the best-grade coals. The nature of the ownership of coal lands determines to a large extent the percentage of recovery from a given area. As it has been found costly to mine pillars under land where the surface is owned by individuals, the size of pillars left to protect the surface is of prime consideration. Some coal companies in this state where the ownership is in fee leave such large pillars between rooms that they can be recovered easily by robbing, but when such companies are in possession of the mineral rights only, pillars of sufficient size only to support the surface are left, and consequently they are lost. Longwall or semi-longwall mining is prohibitively expensive where the surface is not owned by the coal company.

In Alabama coal seams, where the coal lies close to the surface, are prospected mainly by sinking test pits on the outcrop, at intervals of about  $\frac{1}{4}$  mile, and then tying up these prospect pits with levels. Where the acreage is large, it is not uncommon to put down diamond-drill holes into the body of the property, even though coal along the outcrop persists in thickness, quality and regularity as to elevation. When the development of a coal property is proposed, with only the coal showing on the outcrop and then pitching into the body of the property, prospecting is done along the outcrop, and where the pitch is not too great or the basin shown by geological study not too deep, drillholes are put into the body of the property. Where the depth of the coal prohibits diamond drilling, geological study of the strata above the coal is made to determine the probable persistency of the seam.

In a region where the coal seam changes, both as to direction and character, without warning and in comparatively short distances, this latter method is not satisfactory, and development following such prospecting involves great risk. In one case where seven

NOTE—First part of article, entitled "Alabama Coal-Mining Practices," to be presented at the Birmingham meeting of the American Institute of Mining and Metallurgical Engineers.







Table I—Coal and Coke Production in Alabama, 1870-1923

Year	Coal	Number of Men Killed	Tons Produced per Life Lost	Number Employees per Life Lost	Coke
1870	13,200				
1871	15,000				
1872	16,800				
1873	44,800				
1874	50,400				
1875	67,200				
1876	112,000				
1877	196,000				
1878	224,000				
1879	280,000				
1880	380,000				60,718
1881	420,000				109,033
1882	896,000				152,940
1883	1,568,000				217,531
1884	2,240,000				244,009
1885	2,492,000				301,180
1886	1,800,000				375,054
1887	1,950,000				325,020
1888	2,900,000				1,030,510
1889	3,572,893				508,511
1890	4,090,409				1,072,942
1891	4,750,781				1,282,496
1892	5,529,312				1,501,571
1893	5,270,042	17	310,000	529	1,168,085
1894	4,361,312	19	229,200	470	923,817
1895	5,705,713	38	150,150	217	1,444,359
1896	5,745,617	28	205,201	353	1,479,437
1897	5,893,771	38	151,122	326	1,443,017
1898	6,466,741	45	143,705	220	1,663,020
1899	7,484,778	40	187,119	323	1,787,809
1900	8,273,362	37	223,603	386	2,110,837
1901	8,970,617	41	218,186	345	2,148,911
1902	10,329,479	50	206,590	358	2,552,246
1903	11,700,753	57	205,276	340	2,693,497
1904	11,273,151	84	135,204	210	2,340,219
1905	11,900,153	185	64,325	93	2,576,786
1906	12,851,775	96	133,873	191	3,217,068
1907	14,424,863	154	93,668	131	3,096,722
1908	11,523,299	108	106,697	174	2,335,602
1909	13,790,268	129	106,901	156	3,047,510
1910	16,139,228	238	67,812	92	3,231,399
1911	15,011,853	209	71,827	108	2,756,697
1912	16,513,040	121	136,471	193	2,881,861
1913	17,907,284	124	144,413	203	3,531,505
1914	15,525,903	126	123,222	190	3,092,771
1915	15,266,831	63	242,331	366	2,958,062
1916	18,234,625	118	154,531	214	4,385,493
1917	20,413,811	108	187,298	256	4,868,598
1918	19,521,840	110	177,473	239	4,344,726
1919	15,928,196	93	171,277	276	3,397,748
1920	17,391,437	78	222,967	352	3,982,472
1921	13,015,017	80	162,688	334	2,547,664
1922	18,757,681	183	102,501	160	3,760,064
1923	20,919,303	89	235,048	133	4,689,641

from the actual mining of coal in these basins has furnished tangible information and the risk has been eliminated.

Table I shows production of coal mined in Alabama from 1870 to 1923, the number of men killed, the number of tons produced per life lost, the number of employees per life lost during the same period, and the tons of coke produced annually from 1880 to 1923, inclusive. Table II shows the tons of coal produced from the various seams, according to counties, for the Warrior, Plateau and Coosa fields for 1923. Table III shows the production from the Cahaba field, according to counties and seams, for 1923. Table IV shows the average number of days coal mines worked in the ten most important coal-producing states, according to compilation of the U. S. Geological Survey, from 1917 through 1921. Table V shows average analyses, as furnished by the U. S. Bureau of Mines, covering all seams mined in Alabama, together with the fusing temperatures of the ash.

Fig. 1 illustrates typical sections of thirty seams mined in the state. The production of the mines is used as follows: Railroads, 30 per cent; other steam users, 13 per cent; furnace companies, 43 per cent; domestic, 10 per cent; bunker, 4 per cent.

The average distribution by states of Alabama's production of coal is as shown in Table V.

About 60 per cent of the coal produced is put through a cleaning process, for which washeries and mechanical cleaners are extensively used. The bulk of the coke output produced is used in the blast furnaces of the state.

Estimates of the ore and coking-coal reserve must of necessity be an approximation. A fair estimate of the red-ore reserve has been placed at 1,500,000,000 tons; the brown-ore at 75,000,000 tons. If the high-silica red and brown ore could be rendered available for smelting through concentration, it is probable that the total reserve would be increased by fully 1,000,000,000 tons. However, a method of concentration has not yet been devised.

The estimated tonnage of coking coals in the Warrior field is given at 4,195,328,000. Though the coking-coal reserve, which does not include coals in the Cahaba field, which probably will be used for coking, is in

drillholes were put into a body of coal consisting of 750 acres, and from twelve to fifteen test pits were opened in the outcrop, two faults were encountered in the mining that the prospecting did not reveal.

In the Cahaba field, where the coal pitches and lies in basins, geological study and test pits on the outcrops have been the only means of prospecting. When this field was first developed many operators came to grief; it is only within recent years that a knowledge gained

Table II—Production in 1923, from Different Seams of Warrior, Plateau and Coosa Fields, According to Counties

Name of Field and Seam	Blount County		Cullinan County		Jefferson County		Marion County		Tuscaloosa County		Walker County		Winston County		Etowah County		Total Number of Mines	Total Production, Tons
	Number of Mines	Production, Tons	Number of Mines	Production, Tons	Number of Mines	Production, Tons	Number of Mines	Production, Tons	Number of Mines	Production, Tons	Number of Mines	Production, Tons	Number of Mines	Production, Tons	Number of Mines	Production, Tons		
Warrior field																		
Merica					12	373,362					7	385,716					19	759,078
Jack Creek	1	221,207	1	16,526	9	496,021	4	184,332			12	736,224	3	9,400			30	1,663,710
Blue Creek					3	59,438			2	227,132							5	286,570
Brookwood									10	473,457							10	472,457
Arter									5	86,610							5	86,610
Orona											5	476,138					5	476,138
Agger											14	1,007,118					14	1,007,118
Jefferson					5	363,697					1	1,950					6	365,647
Lary Lee					19	3,705,812					24	2,399,598					43	6,105,410
Lildale									6	414,619							6	414,619
St. Carmel											21	830,017					21	830,017
Ratt					28	4,910,951					21	400,337					49	5,311,288
Total	1	221,207	1	16,526	76	9,909,281	4	184,332	23	1,201,818	105	6,237,098	3	9,400			213	17,779,662
Plateau field																		
Underwood		163,231													2	9,905	Several small mines	173,136
Coosa field																		
One active																		

Total production from all beds in active coal fields, 20,919,303 tons. Total number of mines, as reported, 272 (in a number of cases several openings were considered as one mine). Total number of active seams, as reported, 29.







Cambrian measures. This field is 68 miles long and from 5 to 8 miles wide; it contains a surface area of 394½ square miles. There are eleven basins, not including the "Overturned Measures."

Coal seams in this field are principally pitching. The roof conditions generally are not so good as in the Warrior field, and more pumping must be done. Considerable methane is encountered, which, together with a variation in the pitch and thickness of the seam, makes mining more difficult than in the Warrior field. Columnar sections of the coal strata in both the Warrior and Cahaba fields are shown in Fig. 3.

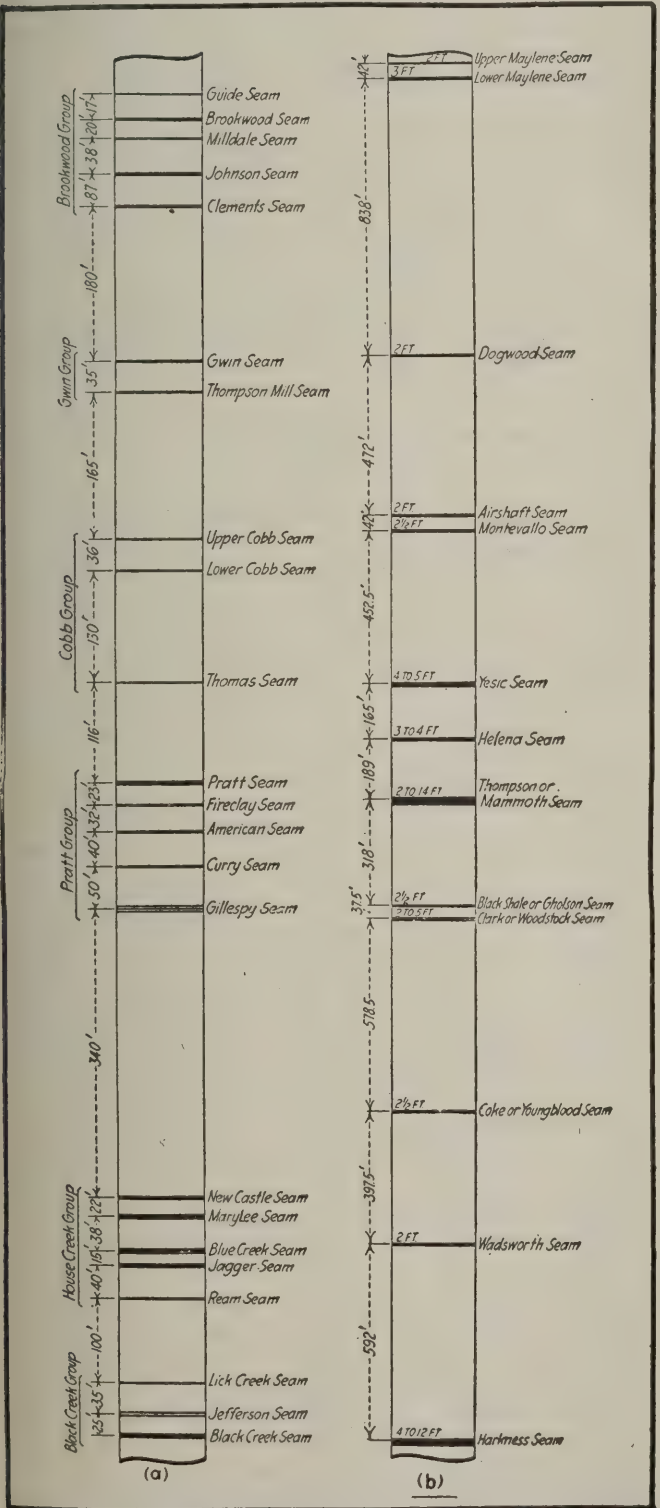


Fig. 3—Sections of Two Important Fields  
Section (a) is in the southeast edge of the Warrior coal basin and (b) is in the Cahaba basin near the town of Montevallo.

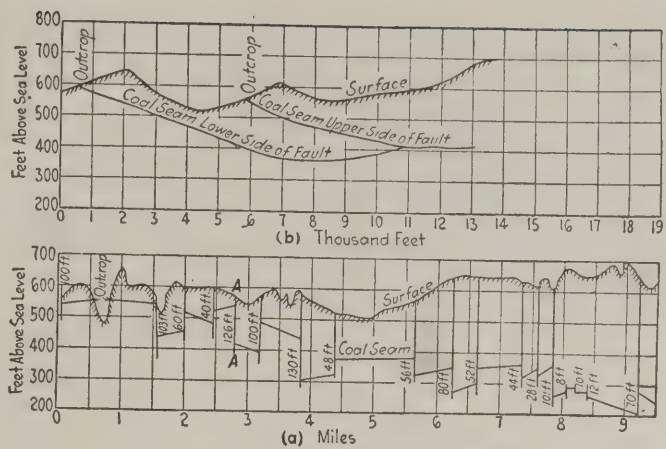


Fig. 4—Alabama Mining Is Difficult  
Here is shown in (a) a dislocation fault in the Pratt seam of the Warrior field. A thrust fault (b) is shown along A-A.

The Coosa field lies mainly in Shelby and St. Clair counties and produces little or no coal.

The Plateau region includes those coal measures known geologically as the Plateau field. The Plateau region consists "of the high, wide, flat and plainlike areas of the tops of Cumberland Mountain, Sand Mountain, Racoon Mountain and Lookout Mountain."

Table V—Distribution of Alabama Coal by States			
	Per Cent.		Per Cent.
(1) Alabama.....	67.0	(6) Tennessee.....	1.5
(2) Georgia.....	10.9	(7) Arkansas.....	0.6
(3) Mississippi.....	9.5	(8) Texas.....	0.6
(4) Louisiana.....	8.0	(9) South Carolina.....	0.1
(5) Florida.....	1.8		

The Plateau region, of which the coal measures are a part, comprises about 4,500 square miles. The coal measures in this field never have been mined profitably. Several furnaces north and east of Birmingham were built in this region, with the hope of procuring an adequate and suitable fuel and ore supply; but all of these ventures proved failures as far as procuring raw material in this region is con-

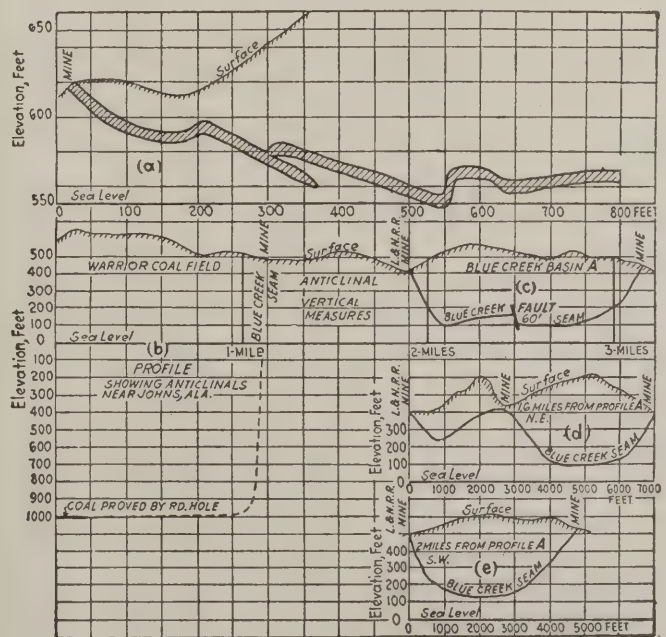


Fig. 5—Blue Creek Basin Conditions  
This region is typical of Warrior field in which there are nineteen faults in nine miles. The sections of this figure are: (a) thrust faults; (b), (c), (d) and (e) regional profiles.



cerned. The coal seams in this field are pockety, irregular and uncertain.

When the term "regular" is applied to coal seams in Alabama it is used only in its geological sense and not with the meaning given by the engineer. In the Warrior and Cahaba fields the chief producers, the pitch, thickness and character of the seams vary greatly in a limited area. Though the examples here cited probably should not be considered typical, they are fairly illustrative of that with which the producers of coal in Alabama must contend.

In the Warrior field adjacent to Ensley the greatest quantity, as compared to all the other seams, of high-grade coking coal has been produced from the Pratt seam. Some idea of the difficulty of coal mining in Alabama may be gleaned from Fig. 4 (a) which shows a profile parallel to and  $\frac{1}{2}$  mile from the outcrop, showing dislocation faults actually proved by mine workings on the Pratt seam in the Warrior field. In nine miles there are nineteen faults, the throw of which varies from 8 to 130 ft., and there is no regularity in the pitch of the coal. In (b) is shown a thrust fault along A-A.

Some of the problems of Alabama coal seams are illustrated in Fig. 5. A profile of the Blue Creek basin of the Warrior field, showing thrust faults, as proved from mine workings, is shown at (a); a profile

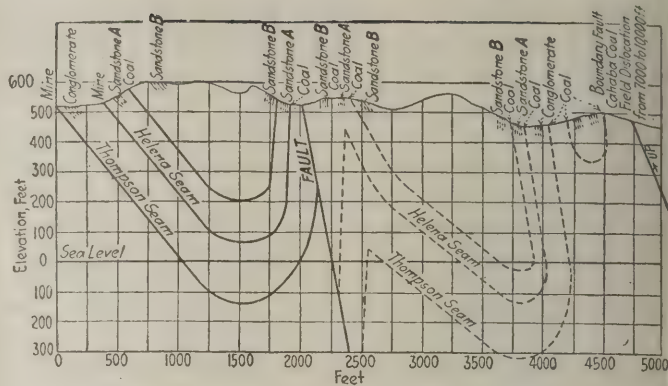


Fig. 6—How Coal Lies in Helena Basin

Full lines show proven conditions and dotted lines are a determination of the seams from geological studies.

of the anticlinals near Johns, in the same basin, is shown at (b). At (c) and (d) are profiles through the same basin, (c) being 1.6 miles northeast of (a) and (d) 2 miles southwest. A profile across the Helena basin, in the Cahaba field, is shown in Fig. 6. The full lines represent the seams as proved by mine workings as far as the fault; the broken lines are determinations of the continuation of these seams from geological studies. They give a fair indication of what may be expected beyond the fault.

Table VI—Average Analyses and Fusing Temperatures of Ash from Alabama Coal Seams\*

Seams	Moisture, Per Cent	Volatile Matter, Per Cent.	Fixed Carbon Cent.	Ash, Per Cent.	Sulphur, Per Cent.	B.t.u.	Fusing Temperature of Ash, Degrees F.		
							Minimum	Maximum	Average
America.....	0.94†	30.06†	60.30†	8.69†	1.79†	13,872†	2,365	2,855	2,570
Black Creek.....	2.61†	29.56†	59.27†	8.55†	1.76†	13,591†			
Black Shale.....	1.28	34.18	61.03	3.49	1.04	14,521	2,010	2,800	2,430
Blue Creek.....	3.41	33.39	59.71	3.41	1.02	14,237			
Bragg.....	1.50	36.20	59.80	2.50	0.60	14,670	2,060	2,110	2,080
Brookwood.....	4.60	35.10	57.90	2.40	0.60	14,210			
Blue Creek.....	0.77	24.40	65.04	9.78	0.72	13,912	2,620	2,910	2,830
Bragg.....	3.84	23.64	63.01	9.48	0.70	13,478			
Brookwood.....	0.80	34.20	58.20	6.80	1.50	14,070	2,150	2,180	2,160
Brookwood.....	2.30	33.60	57.40	6.70	1.50	13,860			
Brookwood.....	0.66	29.61	59.68	10.04	1.07	13,671	2,800	2,910	2,730
Brookwood.....	3.58	28.74	57.89	9.74	1.00	13,270			
Carter.....	0.85	30.41	60.53	8.00	0.91	13,977	2,540	2,850	2,730
Carter.....	2.80	30.00	59.33	7.86	0.90	13,699			
Cedar Cove.....	1.20	34.30	57.60	6.90	2.40	13,900			
Clark.....	4.10	33.30	56.00	6.60	2.30	13,500			
Clark.....	1.15	35.68	55.61	7.55	0.65	13,915	2,060	2,500	2,210
Clark.....	2.31	35.26	54.96	7.46	0.64	13,750			
Corona.....	1.28	39.37	49.54	9.81	2.28	13,030	2,230	2,440	2,360
Corona.....	2.44	38.91	48.95	9.70	2.25	12,878			
Gholson.....	1.31	35.79	59.36	3.53	0.66	14,480	2,090	2,410	2,210
Gholson.....	3.01	35.17	51.34	3.47	0.67	14,232			
Glass.....	0.70	31.60	55.50	12.20	0.70	13,280	2,390	2,450	2,420
Glass.....	2.50	31.00	54.60	11.90	0.70	13,030			
Gould.....	0.75	30.90	60.32	8.03	1.87	13,934	2,450	2,510	2,470
Gould.....	2.97	30.21	58.97	7.85	1.83	13,622			
Harkness.....	1.21	33.27	55.31	10.21	2.02	13,393	2,090	2,660	2,300
Harkness.....	2.33	32.90	54.67	10.09	2.00	13,319			
Helena.....	1.23	34.43	55.76	8.57	0.62	13,569	1,910	2,790	2,270
Helena.....	3.71	33.53	54.36	8.38	0.59	13,255			
Henry Ellen.....	1.43	33.50	53.50	11.57	0.88	13,212			
Henry Ellen.....	2.52	33.13	52.91	11.44	0.87	13,091			
Jagger.....	1.48	29.72	52.92	15.87	0.95	12,336	2,390	2,930	2,670
Jagger.....	2.95	29.29	52.09	15.66	0.94	12,213			
Jefferson.....	0.81	33.22	59.34	6.61	3.22	14,151	2,060	2,420	2,260
Jefferson.....	2.25	32.74	58.48	6.48	3.15	13,947			
Mary Lee.....	1.11	30.37	56.08	12.42	1.11	13,072	2,200	2,950	2,740
Mary Lee.....	2.86	29.82	55.11	12.19	1.10	12,841			
Maylene.....	1.40	37.15	53.95	7.50	0.45	13,603	2,190	2,470	2,330
Maylene.....	2.99	36.55	53.08	7.38	0.44	13,070			
Milldale.....	0.61	31.75	63.03	4.60	0.93	14,566	2,090	2,800	2,420
Milldale.....	2.11	31.26	62.09	4.52	0.91	14,347			
Montevallo.....	1.36	37.21	53.85	7.57	0.84	13,719	2,090	2,470	2,330
Montevallo.....	2.51	36.78	53.22	7.48	0.83	13,481			
New Castle.....	1.00	31.08	53.89	14.03	2.04	12,849	2,390	2,510	2,450
New Castle.....	2.97	30.46	52.82	13.75	2.00	12,593			
Nunnally.....	0.63	34.97	56.27	8.13	0.97	13,787	2,190	2,410	2,300
Nunnally.....	2.22	34.41	55.37	8.00	0.95	13,566			
Pratt.....	0.51	29.66	62.81	7.00	1.59	14,317	2,180	2,850	2,390
Pratt.....	2.45	29.60	61.46	6.38	1.57	14,149			
Thompson.....	1.79	35.73	55.53	6.93	0.60	13,646	2,060	2,400	2,190
Thompson.....	3.00	35.29	54.83	6.86	0.59	13,518			
Woodstock.....	1.47	35.22	59.57	3.73	1.07	14,390	2,110	2,390	2,240
Woodstock.....	3.19	34.61	58.52	3.67	1.05	14,138			
Yessick.....	2.35	30.43	46.24	20.98	1.57	11,221	2,240	2,340	2,280
Yessick.....	4.21	29.85	45.36	20.58	1.54	11,008			
Youngblood.....	1.08	35.25	58.39	5.28	1.28	14,395	2,010	2,220	2,090
Youngblood.....	2.71	34.67	57.43	5.19	1.26	14,373			
Mount Carmel.....	1.41	30.52	54.85	13.17	0.81	12,840			
Mount Carmel.....	3.14	29.98	53.90	12.96	0.80	12,506			

\* Table compiled by J. J. Forbes, Bureau of Mines, Birmingham, Ala., analysis made at the Laboratory of Bureau of Mines, Pittsburgh, Pa.

† Analyses on "air dried" basis; this order applies in each seam given.

‡ Analyses on "as received" basis; this order applies in each seam given.





# News Of the Industry



## Sees Shortsighted Policy in Snatching Britain's European Coal Trade

No Lasting Good in Forcing American Product Into Unnatural Markets  
—Exported Raw Material Can Be Turned to Finished  
Product—British Prosperity Threatened

BY PAUL WOOTON  
Washington Correspondent of *Coal Age*

Elation is being manifested in some quarters because the demoralized state of British commerce has given the United States a chance to snatch away some of that country's coal markets in Europe. The American coal trade is not a unit in believing there is any permanent or even temporary good in forcing our coal into unnatural markets. To begin with, our resources of smokeless and gas coals are relatively limited when compared with our deposits of lower-grade coals. It would be in the public interest, it is argued, to have the life of the high-grade fields extended as much as possible, so that that coal could be used to sweeten the output from lower-grade fields. Were well-financed organizations to apply forced draft to the export of this high-grade coal the day would not be distant when it would not be available for mixing with southern Illinois coal, for instance—an eventuality which would spell disaster to the Chicago steel industry.

While there are some in the coal trade, as well as out of it, who think it is bad national policy to export raw materials when we are in a position to turn such raw materials into finished products, the preponderance of opinion is that we should extend our export of coal within reasonable limits. The overwhelming desire is to say nothing that would discourage aggressiveness in foreign trade or the employment of all the keenness we can muster to extend our general commerce. There is present, nevertheless, a decided conviction that we have little to gain and much to lose by attempting to strip the British of markets that naturally are theirs.

Even were it possible for us to take advantage of the present situation, when the British are laboring under great disadvantages, we would contribute dangerously to European instability. More than one-tenth of the people of Great Britain depend directly on the coal industry for their daily bread. England lives by trading, and not by manufacturing. Coal is the keystone in its economic arch. It may be within our power to loosen that

stone a little, but it would bring about unexpected complications.

The United Kingdom and its colonies and dominions are our best customers. Were we to take away any substantial portion of its coal markets, we would decrease in multiplied ratio that country's ability to buy our animal products, our breadstuffs and our machinery. Even were we to sell large amounts of coal in Europe it would be at best an insignificant benefit to one-half of one per cent of our population.

Regardless of what we might be able to do just at this time, it is quite apparent that in the long run we cannot sell any appreciable amount of coal in old-world markets. England is in a similar position with regard to her coal trade as she was with the war. She had to win it and she has to maintain her coal trade. Those who think the British can be permanently dislodged from many of their coal markets are underestimating their tenacity and their skill.

### British Must Use Mechanical Aids

There can be no disputing that the fact that we are in a position at this time to compete with the British in Europe is an indictment of the British industry. It is evident that it must undergo a decided psychological change and must find some way to make extended use of mechanical aids, but it will work out its salvation eventually.

Just at present one of the important things in the interest of the success of the Dawes plan and the rehabilitation of our European customers is to interfere as little as possible with that process. England, with all its financial solvency, is likely to be less prosperous soon even than is Germany. It is equally as important in the stabilization of Europe and more important to the United States, in particular, that Great Britain be restored to prosperity just as Germany is being restored.

Those who contributed the thoughts on which this article is based were careful to point out that their remarks apply only to overseas exports and not to the coal shipments going to Canada. This business must be

### Labor Portfolio for Lewis?

Speculation is going the rounds in official circles at the national capital as to the reward Mr. Lewis is to receive in the event of a Republican victory at the polls. His name is being mentioned in connection with the labor portfolio. If for any reason he is not chosen for that post, it is expected fully that he is to be given some other important place.

The consensus in Washington seems to be that Warren Stone, president of the Brotherhood of Locomotive Engineers, had the better of the argument with John L. Lewis, president of the miners' union, in regard to the operation of the brotherhood's mine in West Virginia. Politically, Mr. Stone suffered severely and his reputation as a trade unionist has been hurt badly.

kept on all fours with our internal commerce, all agree. In building up our coal trade with Canada we have assumed an obligation which we must continue as long as it is in the market for our coal. Every time there is a strike in this country someone shouts for an embargo against shipments to Canada, but even during the most critical shortage of the war period no thought ever was given to any suggestion which would differentiate between the allotments accorded our states and the Canadian provinces.

### Railroads Place More Orders For Equipment

The American Car & Foundry Co. has received an order for 600 mine cars from the Berwind White Coal Mining Co., and the Pennsylvania Coal Co. has placed an order for 100 mine cars with the Pressed Steel Car Co.

The Clark Car Co., of Pittsburgh, has received an order from the Tennessee Coal, Iron & Railway Co. of Birmingham, Ala., for four 30-yard extension side-dump cars. The Lehigh & New England has given a contract for the repair of 300 gondola cars to the American Car & Foundry Co.

Officials of the leading equipment companies expect further large car inquiry in the near future. The Atchison will come into the market for 5,000 additional freight cars and more passenger coaches and the Burlington is likely to inquire for 2,500 additional freight cars soon.



## Britons to Make Study of American Explosives

Washington chemists entertained at dinner Sept. 21 in honor of Prof. E. C. Bailey, of the University of Liverpool; Prof. F. G. Donan of the University of London; Prof. J. F. Thorpe of Imperial College, London; Sir Richard Threlfall and Sir Robert Robertson, explosives chemist for Great Britain.

Prof. Fritz Haber, Director of the Kaiser Wilhelm Institute of Physical Chemistry, of Berlin, was in Washington on the day of the dinner and it was suggested that he be included among the guests. This raised determined protest from certain of the Washington chemists and no invitation was extended to Professor Haber.

Professor Thorpe and Sir Robert Robertson have come to this country to make a study of American explosives.

While British coal mines have made more progress in the application of rock dust to prevent explosions than has been accomplished by American mines, they have not been so uniformly successful in developing safe types of explosives. The U. S. Bureau of Mines is to conduct tests for the English explosives-testing station on British "permitted" explosives, to determine wherein they differ from the "permissible" explosives approved by the Bureau of Mines for use in gaseous and dusty coal mines. This work is being done in pursuance of an arrangement for the exchange of information between the British and American mining bureaus.



C. Lorimer Colburn

Recently resigned from the staff of the U. S. Bureau of Mines to enter private practice as a consulting mining engineer at Denver, Colo. During the last three years Mr. Colburn has become well known as a safety engineer, having been assigned in 1921 to co-operate between the U. S. Bureau of Mines and National Safety Council. He visited the coal-mining membership of the council to assist them in enlarging their safety program. During the past year Mr. Colburn has been serving as director of the Joseph A. Holmes Safety Association, and the number of chapters has been doubled and the influence of the chapters has been increased. Most of the safety chapters have been organized at coal-mining operations. During the World War Mr. Colburn was a captain of engineers.

## Mine-Supply Houses Merge; \$2,500,000 Involved

More than \$2,500,000 is said to be involved in a deal announced Sept. 18 whereby the Banks Supply Co. of Huntington, W. Va., acquired a majority of the stock of the Miller Supply Co., one of the largest mine, mill and railway supply houses in the Huntington district. The capitalization of the Banks Supply Co. will be increased to \$1,400,000.

The Miller company and its branches will be consolidated with the Banks company as soon as possible and the personnel of both organizations will be held intact, it was said. J. C. Miller, W. J. Harvie and T. G. Tinsley, all of the Miller firm, will be added to the directorate of the Banks Supply Co. and another director will be elected by the stockholders.

## Anthracite Circular Prices For October, 1924

(Gross Ton, F.O.B. Mines)

	Broken	Egg	Stove	Nut	Pen.
Lehigh & Wilkes-Barre.....	\$8.00	\$8.75	\$9.00	\$8.75	\$5.75
Pattison & Bowns.....	8.90	8.90	9.15	8.90	5.50
Phila. & Reading.....	9.15	9.15	9.40	9.15	6.00
Lehigh Valley.....	8.50	8.75	9.05	9.05	5.75
Lackawanna.....	8.00	8.75	8.75	8.75	5.75
Lehigh Coal & Nav.....	9.25	9.25	9.50	9.25	6.00
Del. & Hudson.....	9.00	9.00	9.00	9.00	6.00
Thorne, Neale & Co. (Temple Coal Co.).....		9.20	9.55	9.20	5.75
M.A. Hanna & Co.....	8.80	9.15	9.65	9.25	5.75

Prices for steam sizes, as quoted by companies are as follows: Buckwheat No. 1, \$3 @ \$3.15; rice, \$2 @ \$2.25; barley, \$1.50; birdseye, \$1.60.

## Output and Value of Coal from Illinois Mines in 1923

(Compiled by U. S. Geological Survey)

County	Loaded at mines for shipment (net tons)	Sold to local trade and used by employees (net tons)	Used at mines for steam and heat (net tons)	Made into coke at mines (net tons)	Total quantity (net tons)	Total value	Average value per ton	Number of employees—				Average number of days worked
								Underground		Surface	Total	
								Miners, a	All others			
Bond, Jefferson, Johnson and White.....	305,768	9,915	6,384	.....	322,067	\$738,000	\$2.29	422	149	82	653	109
Bureau.....	429,125	62,212	34,035	.....	525,372	1,855,000	3.53	1,041	317	157	1,515	139
Cass, Edgar, Greene, Hancock, Moultrie, Schuyler and Warren..	104,275	17,152	9,749	.....	131,176	344,000	2.62	149	35	17	201	176
Christian.....	3,760,389	172,142	55,451	.....	3,987,982	8,640,000	2.17	2,463	879	441	3,783	178
Clinton.....	636,803	71,569	36,700	.....	745,072	1,767,000	2.37	937	286	117	1,340	90
Franklin.....	13,286,349	124,149	285,491	.....	13,695,989	37,711,000	2.75	9,498	4,791	1,948	16,237	166
Fulton.....	2,051,722	71,758	27,344	.....	2,150,824	5,864,000	2.73	2,039	687	240	2,966	172
Gallatin.....	26,400	700	2,000	.....	29,100	78,000	2.68	158	69	40	267	34
Grundy.....	164,910	16,422	12,805	.....	194,137	774,000	3.99	260	96	44	400	194
Henry.....	20,000	36,624	1,756	.....	58,380	177,000	3.03	90	17	16	123	185
Jackson.....	1,267,348	51,639	35,097	.....	1,354,084	3,409,000	2.52	1,035	408	206	1,649	156
Knox.....	.....	15,636	508	.....	16,144	48,000	2.97	33	5	5	43	167
La Salle.....	227,643	304,457	13,583	.....	545,683	1,918,000	3.51	629	169	125	923	198
Livingston.....	3,863	38,218	1,470	.....	43,551	159,000	3.65	110	24	16	150	121
Logan, McLean, Putnam, Will and Woodford....	681,793	157,402	45,026	.....	884,221	2,458,000	2.78	1,158	317	163	1,638	215
McDonough.....	.....	2,861	.....	.....	2,861	12,000	4.19	16	.....	.....	16	92
Macon.....	20,037	170,274	7,347	.....	197,658	777,000	3.93	266	139	30	435	167
Macoupin.....	6,966,593	114,167	192,730	.....	7,273,490	16,634,000	2.29	4,738	2,078	620	7,436	165
Madison.....	3,416,031	280,526	114,288	.....	3,810,845	9,110,000	2.39	2,914	1,209	357	4,480	147
Marion.....	638,148	37,940	44,200	.....	720,288	1,748,000	2.43	671	226	101	998	155
Marshall.....	283,263	22,830	11,982	.....	318,075	1,228,000	3.86	517	133	50	700	228
Menard.....	21,193	50,994	2,164	.....	74,351	227,000	3.05	160	48	31	239	101
Merced.....	119,903	10,277	1,275	.....	131,455	385,000	2.93	112	31	21	164	214
Montgomery.....	2,645,489	43,038	64,363	.....	2,752,890	6,829,000	2.48	2,371	1,055	303	3,729	143
Peoria.....	1,013,860	127,252	9,656	.....	1,150,768	3,015,000	2.62	1,070	346	136	1,552	185
Perry.....	2,293,692	147,767	83,089	.....	2,524,548	5,223,000	2.07	2,498	903	466	3,867	123
Randolph.....	1,635,369	31,806	35,297	.....	1,702,472	4,188,000	2.46	1,387	609	204	2,200	149
Rock Island.....	3,000	25,200	1,067	.....	29,267	77,000	2.63	48	11	6	65	138
St. Clair.....	4,643,852	384,072	124,024	.....	5,151,948	10,821,000	2.10	4,780	1,362	618	6,760	133
Saline.....	5,134,291	66,733	131,877	.....	5,332,901	14,283,000	2.68	4,745	2,020	801	7,566	138
Sangamon.....	7,040,597	309,594	126,854	.....	7,477,045	17,369,000	2.32	6,093	2,114	835	9,042	179
Shelby.....	28,878	26,761	4,000	.....	59,639	210,000	3.52	127	34	16	177	160
Stark.....	.....	8,639	5	.....	8,644	31,000	3.59	20	1	2	23	180
Tazewell.....	630,205	132,353	7,929	.....	770,487	2,081,000	2.70	610	166	72	848	216
Vermilion.....	3,799,454	324,640	52,575	.....	4,176,669	10,571,000	2.53	2,202	873	700	3,775	232
Washington.....	410,613	44,143	15,475	.....	470,231	1,279,000	2.72	454	215	66	735	117
Williamson.....	10,073,511	94,907	263,322	.....	10,431,740	26,170,000	2.51	8,373	3,078	1,568	13,019	139
Total, excluding wagon mines.....	73,784,367	3,606,769	1,860,918	.....	79,252,054	\$198,208,000	\$2.50	64,194	24,900	10,620	99,714	158
Wagon mines served by rail.....	58,021	.....	.....	.....	58,021	180,000	3.10	.....	.....	.....	.....	.....
Grand total.....	73,842,388	3,606,769	1,860,918	.....	79,310,075	\$198,388,000	\$2.50	.....	.....	.....	.....	.....
(a) Includes also loaders and shotfireds.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

(2) Includes also loaders and shotfirs.



## West Virginia Produces 18.4 per Cent Of Country's Soft Coal

**H. L. Gandy Tells Operators of State's Importance in the Industry—  
Seven Roads Handle One-Third of Total Shipped—  
Industrial Concerns Returning to Coal**

"West Virginia has 18.5 per cent of the present value of the bituminous development and future reserves, according to the Engineers' Valuation Committee of the U. S. Coal Commission," said Harry L. Gandy, executive secretary of the National Coal Association, at a meeting of the West Virginia Coal Association at White Sulphur Springs, W. Va., Sept. 19, 1924. "During the year 1923, according to the production figures of the U. S. Geological Survey, the West Virginia output of bituminous coal was 18.4 per cent of that of the country, being exceeded only by that of Pennsylvania.

"The product of the West Virginia mines and quarries, according to the last census figures, was 9.3 per cent of the total value of the products of mines and quarries in the United States. Great strides have been made in the production of bituminous coal and I feel quite sure that with the excellent railroad facilities here available, the day will come when the percentage of West Virginia manufactured products will be much higher.

Speaking of the relationship of the bituminous-coal industry to the prosperity of the railroads, Mr. Gandy said: "Seven railroads, the Norfolk & Western, the Chesapeake & Ohio, the Virginian, the Louisville & Nashville, the Illinois Central, the Pennsylvania and the Burlington, loaded about 175,000,000 tons of bituminous coal last year. That was nearly one-third of the year's production and considerably more than one-third of the total amount shipped by rail. These roads received \$279,626,648 for handling bituminous coal, which is 32.6 per cent of the total revenue received by all railroads of the country for handling that commodity.

"From the best data available these seven lines used 41,335,760 net tons of bituminous coal in 1923 at a cost of \$117,664,595, or about \$2.85 per ton. The amount spent for bituminous coal was less than half of the amount received as revenue for handling bituminous coal. Thus we have seven of our important coal roads spending for the bituminous coal necessary to move practically all of their traffic, only about 42 per cent of the amount received as revenue from that commodity.

"It is further interesting to note that while these roads received \$279,626,648 for handling bituminous coal, their total gross operating income, after deduction of operating expenses, was \$280,241,861.

"The public knows but little about coal. Most people order coal for their homes or their places of business without any more thought than would be exhibited by a man going into a store and ordering a suit of clothes made out of cloth, without specifying the kind of cloth. There are perhaps as many varieties of coal as there are of cloth. There are varying kinds for all uses and conditions. The right kind of coal

for a particular use will carry its load to the satisfaction of the user. Not only should there be more widespread information regarding this treasure house of heat and of power but there should be a dissemination of information as to the derivatives of coal. We are only a few years along the way in the extraction of byproducts, and I dare say that the coming years have in store great progress in the better utilization of coal.

"No less eminent an authority than the Director of the Geological Survey recently pointed out that a less percentage of the electricity for public utilities was generated by water power in 1923 than in 1919. That can mean nothing else than that the demand for electricity has grown faster than the development of water power. More and more industrial concerns are finding out that with tranquillity in the coal world the question of the use of coal or of oil is an economic one and these two fuels are finding their correct place. A careful perusal of trade papers and other sources of information shows that the order of the day in New England and other parts of the East is that industrial concerns are again returning to coal.

"There is a significance in the establishment of service bureaus by the anthracite industry to increase the satisfactory utilization of their product and in the widespread and persistent effort of manufacturers to sell and place oil-burning devices.

### Form Research Committee

"Recently, however, the National Coal Association has created a Research Committee to the end that there may be gathered and disseminated among the operators and the public fundamental facts which may be helpful in advancing the use of the product of this industry.

"Day after day we read of consolidations that are taking place in the bituminous-coal industry, but even so they are not keeping pace with consolidations in other lines of business and of trade, and are in no sense affecting the competitive situation. I have been impressed for some time that affiliation of purchasing agents and combinations of the users of coal are worthy of the serious consideration of the operators.

"Heretofore we have been inclined to think of a combination as one which gathered together various units of the same kind of production. Now we have great combinations under which there is being gathered all sorts of units of production. For instance, take the circulars which, according to press reports, recently went to Ford agents in the Northwest, advising of the shipment of coal mined at Ford mines, loaded into Ford cars, hauled on a Ford railroad, transported in Ford freighters and unloaded on the Ford docks at the head of the lakes. All of these are in

### Iowa Miners and Operators Join to Advertise

An advertising campaign to be financed jointly by the operators and mine workers will be opened Oct. 7 by coal-mine operators and miners of Appanoose County, Iowa, to continue seven months. Twenty-two mining companies and approximately 3,500 miners in Sub-district 1 of District 13, United Mine Workers are co-operating in the campaign. The operators have agreed to contribute an amount equal to that raised by the union. It is estimated that \$49,000 will be raised.

addition to many other units of different kinds of production owned by that concern. Combinations of that kind are not in violation of the law, but their size and the effect they have on the business and industrial life of the nation will bear following very closely."

### Coal Exports Fall in August; Canadian Shipments Low

Total bituminous coal exports from the United States during August, amounting to 1,392,862 gross tons, showed a decline from shipments during July, when 1,630,849 tons was exported, but have been exceeded during 1924 by only June and July shipments, according to the Coal Division of the Department of Commerce. A large part of the decrease was due to smaller shipments to Canada, 1,049,346 tons being exported in August against 1,202,400 tons in the preceding month.

Overseas exports of bituminous coal during the month in question were 335,671 tons against 418,500 tons in July. A considerable part of this decrease was caused by smaller shipments to Italy, only 89,040 tons going to that country during August against 115,055 in the previous month.

In the South American trade important decreases were witnessed in shipments to Brazil, the August exports amounting to only 80,892 tons against 104,959 tons in July. There were no August shipments to Argentina or Chile, although exports to those two countries during July were 19,104 and 6,905 tons, respectively. The total exports to South American destinations during August were 90,389 tons as compared with 139,098 tons in July.

Exports of anthracite during August amounted to 257,090 tons against 290,097 tons in July, the decline being mainly due to decreased shipments to Canada.

Total shipments of coke amounted to 42,308 tons in August against 48,983 tons in July, the decrease being largely due to smaller shipments to Canada, 34,953 tons in August against 40,438 tons in the preceding month.

Mother Jones, nationally known friend of the coal miner and champion of union labor, called at the White House Sept. 26 and pledged her support to the President. She said no man or set of men control the labor vote.



## Enjoins Tennessee Miners Against Coercion; Right To Strike Is Recognized

Five local unions of the United Mine Workers, their officers and several hundred individual members, all of whom were named, in Grundy and Marion counties, Tennessee, were enjoined Sept. 20 by Judge Xen Hicks, of the U. S. Court for the Eastern District of Tennessee, in a sweeping order against interfering with the operations of any of the mines operated in these counties by the Tennessee Consolidated Coal Co.

In addition by means of a restraining order members of the union were forbidden to enter the houses of the company which they have been occupying since a strike by the miners began on April 1.

In the opinion Judge Hicks said, in part:

"In these labor disputes, labor—the miners in this case—has the right to strike, the right to refuse to work, the right to use all peaceable means to persuade others not to work, the right to use all peaceable persuasion, the right to assemble for that purpose and to congregate in halls for that purpose, but it has no right to go to the extent of violence, threats, coercion and intimidation."

In discussing this particular case the opinion goes on to say: "It must be admitted that the situation in Grundy and Marion counties is estranged and the feeling intense. All the coal mines have been shut down since April 1. The coal drum of the New Whitehall Coal Co. was blown up with dynamite at a loss of between \$8,000 and \$10,000 when an attempt was made to operate."

Judge Hicks also cites in the opinion the action of a county sheriff who appointed union men as deputy sheriffs to maintain order. The sheriff was scathingly criticized in the opinion, which stated that some of the very defendants had been named as deputy sheriffs for the purpose of arresting themselves.

On the other hand contentions of plaintiff's counsel to term action of the miners in seeking to maintain the wage scale of 1920 throughout the country by the national and district unions as "a conspiracy" was not upheld in the opinion, which stated that though such action might be a conspiracy, it was not an unlawful conspiracy and the miners were within their rights as long as unlawful threats and intimidations were not used.

The unions enjoined were Local 2763, at Tracy City, Grundy County; Local 3509, at Palmer, Grundy County; Local 2572, at Coalmont, Grundy County; Freemont local, Grundy County; Local 4185, at Morganville, Marion County, and Local 1778, at Cartwright, Marion County.

The international organization of the United Mine Workers of America, its officers and Provisional District 19 and its president, William Turnblazer, against whom injunctions were sought, were not enjoined, the opinion stating that insufficient evidence was submitted against these defendants.

## D. H. Pape Joins N. C. A. Staff

Delbert H. Pape, of Ogden, Utah, has joined the staff of the National Coal Association as assistant to Harry L. Gandy, executive secretary. Mr. Pape will devote his attention largely to field and membership activities.

Mr. Pape is 40 years of age and has had a broad experience in coal production. After receiving a high school and



Delbert H. Pape

business college education, he went directly into the mines, working under every classification of labor up to and including the position of foreman.

From 1914 to 1922 he was general manager of the Lion Coal Co., at Ogden, Utah, embracing the Wyoming Coal Co. and the Union Fuel Co. in Wyoming and the Wattis Coal Co. in Utah. In co-operation with P. J. Quealy, of the Gunn-Quealy and the Kemmerer coal companies, he helped organize the Southern Wyoming Coal Operators' Association, and during the war was appointed by United States Fuel Administrator Dr. H. A. Garfield as distributor of coal mined in southern Wyoming, which appointment was made upon the recommendation of all other Wyoming operators and the Union Pacific R.R. officials.

## 'Patronize Home Industry' Move in Indiana

Miners and operators in the Hoosier coal fields are considering starting a campaign in the state to induce coal consumers to buy coal produced in Indiana, instead of buying non-union coal from other states, according to officers of the United Mine Workers. Similar campaigns have been started in other states and have proved successful, it was said. Indiana, according to officers of the mine workers' organization, consumes a large amount of coal that comes from Kentucky and West Virginia. There is no good reason, they say, why consumers should send out of the state for coal when they can obtain just as good coal at home.

## Safety Congress Session Opens in Louisville

Contending that the trade and other associations should co-operate in promoting safety, Richard F. Grant, president of the Chamber of Commerce of the United States and president of the Susquehanna Collieries Co., made the opening address at the Monday morning, Sept. 29, session of the thirteenth annual congress of the National Safety Council at Louisville, Ky., at which a large number of executives and safety men were present. Mr. Grant was the spokesman for an association which itself represents a larger number of representative bodies than perhaps any other in the United States. Other speakers were Norvin E. Green, president of the Louisville Safety Council, and Huston Quin, Mayor of Louisville.

The treasurer's balance showed for Aug. 31 \$4,589 on hand and \$47,290 invested. The total assets less depreciation were \$84,438, with accounts payable of \$3,047.

In the afternoon the Secretary of Labor, James J. Davis, discussed the fundamentals of our industrial safety problem, and Dr. Arnold L. Jacoby, director psychopathic clinic, Detroit, Mich., showed how mental factors entered into the accident problem, making some men more prone to casualties than others.

C. F. Kettering, of the General Motors Research Corporation, discussed the public-safety problem, declaring that 99 per cent of our actions are dominated by instinct rather than by intelligence and that instructions to workers must be repeated with painstaking care. If this is not done the instructions progressively deteriorate. "Jamie" Heron, of Chicago, spoke on ways of building men for safety, and A. W. Whitney, chairman of the American Standards Committee, reported on the standardization of safety codes. The new National Safety Council film, "A Word to the Wise," was shown.

## Big Panhandle Mines Merged In \$2,500,000 Deal

In one of the largest coal deals consummated in West Virginia in some time John C. McKinley, president of the Richland Coal Co., of Wheeling, acquired the Otto Marmet Coal & Mining Co., with which are associated the Black Betsy and Marmet Halm Coal Co. The deal is said to involve approximately \$2,500,000.

The properties transferred are located in Putnam, Kanawha and Mason counties and include about 11,000 acres of coal in addition to two railroads leading from the mines to terminals and river piers, as well as three boats and a large number of barges. Storage facilities and elevators at Cincinnati also are included.

The purchaser will make improvements to increase the output from 200,000 to 500,000 tons a year.

The new owner operates the Richland-Marshall and Mound Shaft mines, at Moundsville; the McKinleyville mines, in Brooke County; the Richland mine, north of Wheeling, and various other properties in the northern Panhandle.



# Dawes Plan Seen as Stimulus to Widen Markets for American Products

Characterizing the Dawes plan as a boon to the world, "without a liability in it," an authority in an unexcelled position to judge believes the industrial activities it will promote will result in greatly increasing markets for our products, while the greater volume of German goods in the channels of world trade is not likely to affect us seriously.

As things are shaping, keenest competition will arise in iron and steel. Plants in the Ruhr have been re-equipped and brought up to the most modern form because the situation has been such that profits could be invested best in equipment. Some working agreement is certain to be made between the producers of the raw material in Lorraine and the steel makers in the Rhur. In addition to being one of the world's most favored centers for steel manufacture, the Ruhr will have an additional advantage, for a time, in that the standard of living has been reduced greatly and low rates of wage will be acceptable. The living standard will rise gradually, but the steel makers will continue to enjoy an advantage until this differential in their favor is overcome.

Our industry is preparing to meet this situation by installing more labor-saving machinery. An indication that our manufacturers have on their fighting clothing is seen in their recent success in obtaining an order for 35,000 tons of corrugated iron in Argentina, an order for which the Continental industry was striving.

On the other hand, the British steel makers are in a bad way. Few of their plants are modern. Instead of striving to reduce their costs effort appears to be concentrated on yelling at the government. Both labor and capital in Great Britain seem to have fallen into a psychological rut which is hampering them in meeting the increasing difficulties which they are facing. Such a large proportion of the British trade is with other countries that it is certain to be hard hit by the rehabilitation of Germany. A much smaller proportion of our trade

is export. In addition, we are in a frame of mind which will do much toward enabling us to hold our own in the export market.

An indication of the commercial demoralization which has overtaken the British is had in the fact that an American coal company apparently is in a position to compete successfully with Great Britain for a large block of Italy's requirements.

Our technical industries are entrencing themselves at home by a great expansion in the practice of mass production of standardized goods, which because of their low price are finding increasing markets abroad—a stronger position than that occupied by the German industry, which in catering principally to the foreign trade cannot take advantage of the economies of quantity production, but must meet the diverse requirements of many lands. There is every reason, however, for our manufacturers to start at once to increase their selling efforts abroad.

Russia at this time is making substantial purchases here of cotton, machine tools and certain other commodities. No confidence can be placed in the future of Russian trade. The establishment of buying commissions in foreign countries, including the United States, tends to bear out every pessimism which has been expressed in connection with the commercial policies of the Soviet authorities. Absolute control of purchasing centers in Moscow. Purchases are shifted quickly for political reasons. The German police, for instance, raided one of the Russian offices and in retaliation all the buying being done in that country was discontinued and transferred to other countries. Similar action was taken when the Russian authorities were displeased by developments in Italy and Switzerland.

This is a new phenomenon. No permanent commerce could be built up under such conditions. An official in Washington might make a nasty remark about the conduct of affairs in Moscow and our manufacturers would

## Mines Bureau Engineer Reaches Mine Disaster Via Air Mail Service

Dr. Hubert Work, Secretary of the Interior, on Sept. 24 addressed this letter of thanks to Postmaster General New for the speedy transportation of a U. S. Bureau of Mines engineer by the Air Mail Service to the scene of the mine explosion at Sublet, Wyo., Sept. 16:

"Permit me to thank you for the recent co-operation extended by the Air Mail Service of your department to the Bureau of Mines of this department, in responding to the call for aid at the recent mine explosion near Sublet, Wyo. The Bureau of Mines engineer of that district, on reaching Cheyenne, found that he was unable to get a train to Rock Springs for many hours. He accordingly requested the Air Mail Service to transport him from Cheyenne to Rock Springs, and, on official confirmation of the request, this was done. As this was a situation in which the lives of miners were imperiled, the action of your department in co-operating to provide speedy transportation to the scene of the disaster was especially appreciated."

find the business they had built up transferred over night to some other country. Russia is buying in this country at this time partly to cater to us and partly because prices are lower. Once that recognition has been obtained much of this business is likely to be placed elsewhere to aid in gaining some further objective. The Russian agents, however, are preaching as they buy. They say much larger orders would be placed were Russia recognized. This argument is being pressed in connection with their purchases of cotton, and our cotton trade is taking the bait. Sight is lost of the fact that with any return approximating normal, Russia again will become an exporter of cotton.

# Bituminous Coal Loaded Into Vessels at Lake Erie Ports During Season to End of August

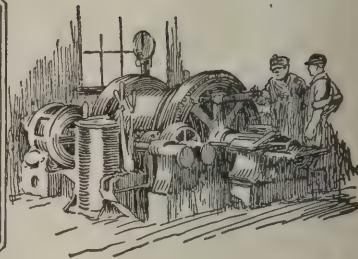
		1924			1923			1922		
Ports	Railroads	Cargo	Fuel	Total	Cargo	Fuel	Total	Cargo	Fuel	Total
Toledo.....	Hooking Valley.....	4,056,708	119,464	4,176,172	2,992,191	90,429	3,082,620	1,746,575	47,846	1,794,421
	Big Four.....	1,375	46	1,421						
Sandusky.....	N. Y. C.-Ohio Central Lines.....	38,159	1,412	39,571	1,008,393	31,639	1,040,032	37,430	772	38,202
	Baltimore & Ohio.....	1,110,205	34,710	1,144,915	1,799,619	53,101	1,852,720	1,775,250	45,936	1,821,186
Huron.....	Pennsylvania.....	2,051,571	63,376	2,114,947	1,903,616	58,689	1,962,305	1,730,372	51,553	1,781,925
Lorain.....	Wheeling & Lake Erie.....	463,986	23,395	487,381	929,100	34,780	963,880	13,403	2,565	15,968
Cleveland.....	Baltimore & Ohio.....	1,116,887	88,422	1,205,309	2,055,327	116,176	2,171,503	32,852	24,147	56,999
	Pennsylvania.....	941,049	109,060	1,050,109	1,155,136	120,378	1,275,514	97,291	45,016	142,307
Fairport.....	Erie.....	205,809	7,454	213,263	542,678	24,061	566,739			
Ashtabula.....	Baltimore & Ohio.....	332,410	58,593	391,003	489,935	43,940	533,875			
	New York Central.....	615,871	71,283	687,154	2,256,891	158,990	2,415,881	44,391	20,086	64,477
Conneaut.....	Pennsylvania.....	700,496	51,796	752,292	1,333,344	58,592	1,391,936	55,201	40,335	95,536
Erie.....	Bessemer & Lake Erie.....	1,034,305	137,462	1,171,767	1,781,915	139,319	1,921,234	99,846	7,840	107,685
	Pennsylvania.....	374,051	50,843	424,894	395,920	53,604	449,524	28,607	42,534	71,141
Total.....		13,042,882	817,316	13,860,198	18,644,065	983,698	19,627,763	5,161,218	328,630	5,489,848
*1923 Storage Loading.....		182,060	4,940	187,000						

NOTE.—Tonnes cover coal line hauled into ports by railroads as shown.  
\*Coal loaded into vessels in December, 1923, after close of navigation (shown in December, 1923, report) and forwarded from Lake Erie ports during 1924 season of navigation.  
†Lake coal into Toledo over Big Four Route and dumped by Ohio Central machine. Compiled by Ore & Coal Exchange, Cleveland, Ohio: H. M. Griggs, mgr





## Practical Pointers For Electrical And Mechanical Men



### Bad Mechanical Features Spoil Good Locomotive Performance

Because a Mine Locomotive Is Considered To Be an Electrical Machine,  
Mechanical Details Should Not Be Neglected, They  
Influence Its Operation

Aside from the many electrical details of a mine locomotive which must always be kept in proper operating condition there are equally important mechanical features to be considered. From the mechanical engineer's point of view derailments of mine locomotives may be caused by the following: Insufficient elevation of the outer rail on curves; too great a difference in size of wheels on one axle; the changing of one pair of wheels on a locomotive without changing the other pair; improper location of wheels with respect to the end-thrust point, usually located at the end of the axle; incorrect shape of wheel tread; wheel not bored true; curves too sharp for the wheelbase of the locomotive; locomotive not properly balanced; hitchings to cars made too high, thus unbalancing the locomotive, especially on grades; broken springs on one or more journals.

#### BAD TRACK, BAD RESULTS

The results from insufficient elevation of the outer rail are well known. Too great a difference in the size of wheels on the same axle forces one wheel to slip continually because one side of the locomotive cannot travel faster than the other; this also causes the wheels to climb the rails at curves.

If one pair of wheels is changed and not the other, in many cases the locomotive will travel at an angle to the track instead of parallel to it. Curves in tracks cause the operating part of the tread on one wheel of a pair to move in toward the center of the locomotive and outward on the other. The same is true if the thrust blocks or plates are not properly set. A correctly shaped pair of wheels will move over on a curve so that the inside wheel is turning on a smaller diameter than the outside wheel; therefore, when repairing and machining wheel treads, the exact shape of a new wheel and tread should be maintained.

If the radius of a curve is too small the locomotive will climb the outside rail. If wheels are not bored at right angles to the tread as they run over the tracks the wheel gage may become too narrow on one-half a revolution and too wide on the other half or, worse yet, cause the locomotive to wobble along the track. This produces a changing wheel gage from too wide to too narrow and increases the liability

of the wheels to drop through or climb the rails.

If the locomotive is not properly balanced the high end tends to climb the rail at curves. This same result will be produced if the car hitchings are too high and the trip heavy. Broken journal springs tend to unbalance the weight on the wheels.

If a deep groove is allowed to wear in the wheel treads the slipping-over effect on curves to compensate for the difference in rail length is prevented. The false flange thus formed pounds the frogs and damages the locomotives and track. Locomotive frames must be kept tight and square; otherwise all parts are under a strain and the axles do not stand at right angles to the track and the wheels cannot run parallel.

J. F. MACWILLIAMS,  
Power Engineer.

Pennsylvania Coal & Coke Corp.,  
Cresson, Pa.

### Oxy-Welding Made It Better Than New

Every shop in the country working with metals may not have among its equipment a punch press of such dimensions as the one illustrated here. Still there are few shop owners that are not faced at one time or another with the specter of a shutdown because of damaged machinery. Thus the main point in the following incident should be interesting as typical of the wide variety of repair and reclamation work done by welding.

We may start with the statement that when broken equipment is carefully repaired with a reinforced oxyacetylene weld it is stronger at the repaired section than it was originally. Some skeptics might say, "Yes, probably," or "Undoubtedly, in laboratory tests, but does the same hold good in practice?"

It does! But to answer the question most satisfactorily is to prove it.

Fig. 1 shows a punch-press frame, a gray-iron casting weighing approximately two tons. A piece of metal too thick or tough broke the casting squarely off at the level of the table. The frame was cracked through a hollow rectangular section 19 in. wide, 20 in. deep, 6 in. thick at the front, 1½ in. at the back and 2 in. at the sides.

After the edges were carefully cut in a V shape and the frame accurately aligned it was preheated by gas burners and a good welding job done by competent oxyacetylene operators. The casting was carefully covered to protect it from any drafts while being welded, and this covering was left in place until after the casting had cooled.

After proper annealing the punch-press frame was put back in service and stood under the work for a year. Then someone again fed it too big a bite and it broke. Of course the frame was sent to the same shop which has welded it after the first accident. It

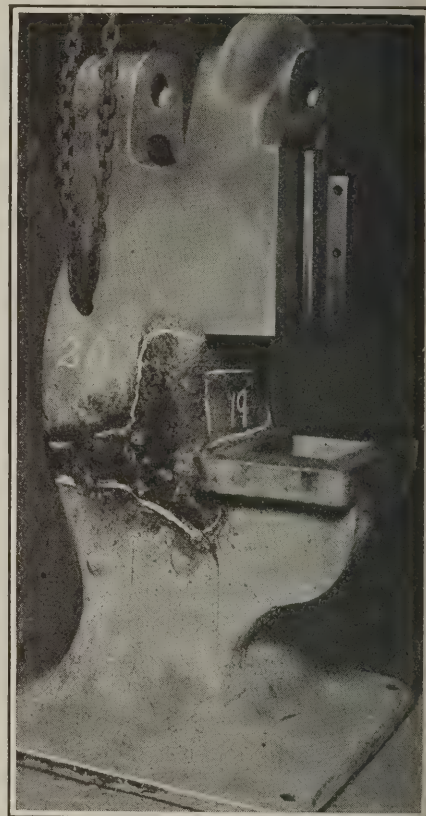


Fig. 1—Where First Fracture Occurred

Before this break was welded the joint was carefully cut in a V shape and preheated. A covering used to protect the metal from drafts was left around the frame until the metal had cooled after the weld was completed.

was again repaired and is shown in the second illustration ready for another term of service.

The point in the story is not that one good job deserves another nor that the competent welder is an ever-ready help in time of trouble but that the second break did not run through the old weld. This was left unharmed. Nor was the new break in the region preheated for the old weld. It was in





Fig. 2—Second Break in New Position

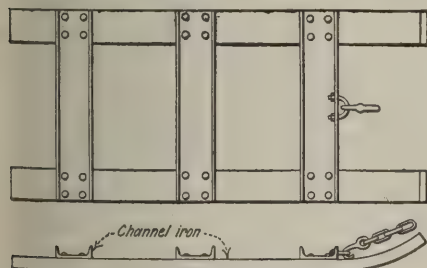
The repaired frame broke in a new place when loaded above capacity. The old weld remained intact. The second repair was made in the same manner as the first and the machine was again placed in service.

the crank bearing 4 ft. away. This, then, demonstrates the original proposition, that a second break in a properly made weld need never be feared.

J. F. IRBY.

## Sled for the Mine Yard

A wagon is not always the easiest means of transporting materials about a mine yard. Whenever something is to be moved in a wagon it must be



## Steel Sled, Strong and Sturdy

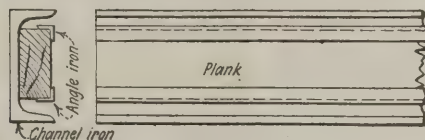
Materials may be easily rolled or shifted onto this sled. No need to strain workmen's backs or break machine parts due to falls.

lifted into the wagon box and again lowered at a delivering point. Aside from the extra labor required for this work, the damage to equipment due to falls or the injury of workmen often is expensive.

A sled or skid always is handy around a mine yard because of the uneven terrain and the ease with which materials may be loaded upon it. Fig. 1 shows the type sled used at No. 9 Mine of Old Ben Coal Co., West Frankfort, Ill. Fig. 2 shows how the inside of the channel frame has been filled to

make it stronger and easier for the driver to stand upon it.

This sled is drawn by mules and easily slides over the ground because of the smooth steel runners. The upper



## Bottom Channel of Frame

The wooden plank in the center of this channel adds strength to the sled and provides a firm footing for the mule driver.

channels are not filled like the lower ones and therefore provide strong edges to hold materials from sliding off. The ease with which heavy barrels are moved about the property is remarkable.

## Make Forge Coke on the Job

Illinois coal is hard to coke, especially after it has been exposed to the air as has the shallow coal in a strip pit. This small but effective outdoor coke



## Coking Strip-Pit Coal

An inexpensive way to get blacksmithing fuel is this of the Black Servant Coal Co. Instead of using smithing coal it makes its own coke which usually can be done. It will work well if the coal is not too sulphury. The coal in a strip pit often has a low sulphur content, owing to its long exposure.

plant, consisting of a fireclay bowl within a housing of light steel, however, cokes it, supplying fuel for the

forges at the strip pit of the Black Servant Coal Co., Elkhart, Ill., the new "Hartshorn" operation. The pipe seen in the illustration is an air line which drives a blast of air up through the coal.

## Locomotive Batteries Save Money and Get Exercise

Often, when a mine is shut down, electric lights, nevertheless, are needed during the day and night. At such times it is often a problem to decide how the overhead charges can be kept as low as possible. If the boiler plant must be kept in operation and a generator must be in service continually men must be employed to operate them, and that is a heavy charge on an idle mine.

The main office of the Madison Coal Corp., at Glen Carbon, Ill., receives its lighting service from one of the mines nearby. During the summer the mine has been idle and in order to avoid keeping the boiler plant and generator in continual operation storage batteries supply the service.

Occasionally, about once every two or three weeks, the boilers and generator are operated for the purpose of recharging the batteries, but as soon as the batteries are again charged to capacity the power plant is shut down.

## LIGHT SUPPLIED FROM BATTERY

The batteries used for the lights also supply power to the electric repair shop which has been in operation quite frequently during the summer. Here electric repairs are made for all the mines of the company.

In the illustration a locomotive battery is shown in the repair shop. Aside from driving the shop equipment the battery supplies current for lights around the mine and in the main office.

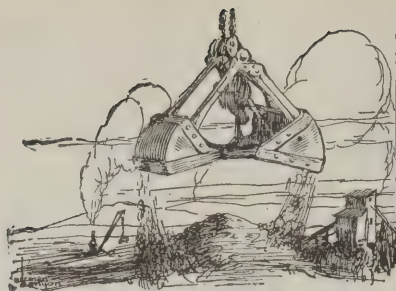
There are many advantages to this scheme aside altogether from the cost of operating the boiler plant and generating unit. Idle batteries deteriorate more rapidly than those in service, and this arrangement furnishes plenty of exercise for the cells and keeps them in good condition.



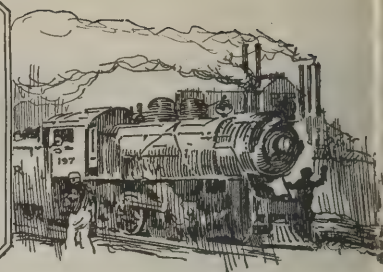
## Battery Furnishes Electric Energy for Lights and Repair Work

All the electrical energy required during the idle period of the mine is received from this battery set up in the electric repair shop. To recharge the cells the boiler and power plant need be operated for only a day every two or three weeks.





# Production And the Market



## Bituminous-Coal Market Gains in Firmness; Demand, Output and Prices Stronger

Further improvement marked the bituminous-coal market during the last week. In keeping with general business conditions, much of the increase is seasonal, and extreme caution is in evidence throughout the trade. Such barometers of trade as freight-car loadings, however, are indicative of healthy conditions. Advancing prices are due largely to domestic demand, offset somewhat by a tendency toward softness in slack.

Much attention is centered on the developments in western Kentucky, where the non-union drive is making headway. If this movement is entirely successful, it is expected to bring the producers of steam coal in Illinois into the same desperate straits in which are the union fields that compete with eastern Kentucky and southern West Virginia.

### Conditions in Kanawha Field Unsettled

In the Kanawha field, where the operators on the Chesapeake & Ohio are making a determined drive to eliminate the union, two large operators, Mike Gallagher, of the Paint Creek Collieries, and Jim Paisley, of the Kelly Creek Collieries, continue idle. Each of these operators agreed with John L. Lewis to sign the Jacksonville scale, which precludes them from joining the drive to open on a non-union basis. They are remaining neutral by not reopening their mines as union operations, which incidentally they could not afford to do. It is understood that this is a bitter disappointment to Mr. Lewis.

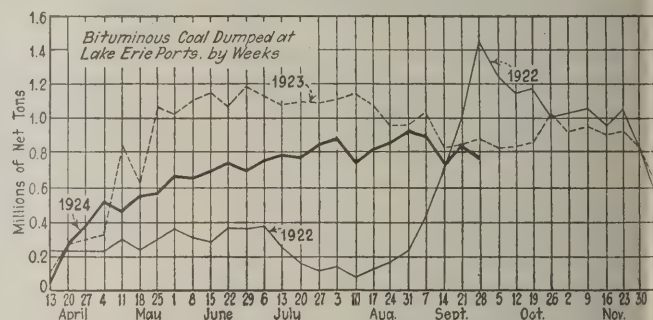
Coal Age Index of spot prices continues to advance, registering its fourth successive weekly gain, the figure as of Sept. 29 being 170, the corresponding price for which is \$2.06. This compares with 169 and \$2.04 respectively on Sept. 22.

Activity at Hampton Roads showed a sharp reaction last week, dumpings of coal for all accounts during the seven-day period ended Sept. 25 totaling 356,557 net

tons, compared with 383,710 tons in the previous week.

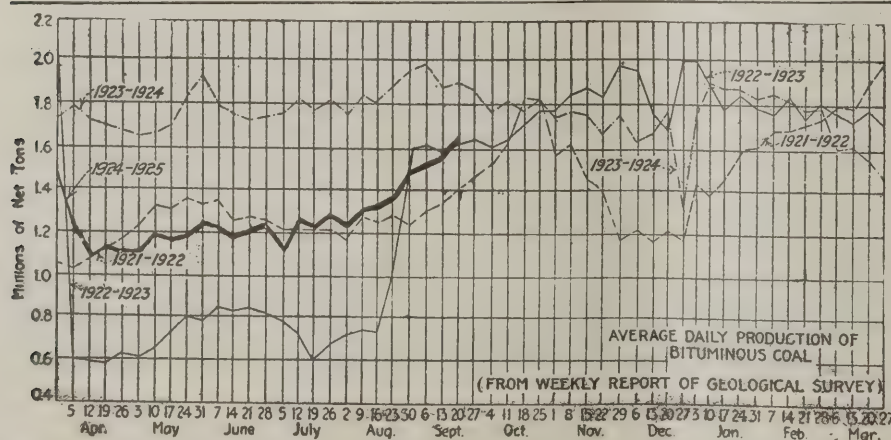
Movement up the lakes seems to be definitely on the wane. Dumpings at Lake Erie ports during the week ended Sept. 28, according to the Ore & Coal Exchange, were as follows: For cargo, 734,246 net tons; for fuel, 39,686 tons, compared with 770,331 and 45,957 tons respectively during the previous week.

Output of bituminous coal continues to show marked improvement, the total for the week ended Sept. 20, according to the Geological Survey, being estimated at 9,902,000 net tons, an increase of 373,000 tons over the week ended Sept. 13, when 9,529,000 tons was produced, according to revised figures. Production is now at the



highest level reached since the first week of March. Anthracite output also gained during the week ended Sept. 20, totaling 1,851,000 net tons, compared with 1,820,000 tons during the previous week.

The anthracite market is notably active, the demand for independent coals being good and line companies moving their product without difficulty. There is a heavy call for stove and chestnut has perked up markedly. Egg is moving fairly well also, and though peas is in more limited demand, it is moving without much trouble. Steam sizes are moving more readily, buckwheat showing considerable strength.



### Estimates of Production

	(Net Tons)	
<b>BITUMINOUS</b>		
	1923	1924
Sept. 6 .....	10,485,000	7,958,000
Sept. 13 (a) .....	11,378,000	9,529,000
Sept. 20 (b) .....	11,454,000	9,902,000
Daily average .....	1,909,000	1,650,000
Cal. yr. to date (c) .....	399,666,000	322,004,000
Daily av. to date .....	1,796,000	1,433,000
<b>ANTRACITE</b>		
Sept. 6 .....	3,000	1,451,000
Sept. 13 .....	2,000	1,820,000
Sept. 20 .....	877,000	1,851,000
Cal. yr. to date .....	69,367,000	65,909,000
<b>COKE</b>		
Sept. 13 (a) .....	317,000	111,000
Sept. 20 (b) .....	335,000	121,000
Cal. yr. to date (c) .....	14,130,000	7,326,000
(a) Revised since last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.		



## Midwest Still Active

Although warm weather prevailed for some time prices have not been reduced on domestic sizes of southern Illinois coal. Operators have enough orders to keep every open mine running to full capacity. It is true they are troubled somewhat in moving screenings, but the better grades from this field have not been materially reduced in price. Central Illinois has increased lump price 25c. per ton. Egg and mine-run prices are stationary, but screenings in a few cases have brought only a modest price.

Eastern Kentucky coal is difficult to obtain in gondola equipment, and prices are firm, but shipments are fairly prompt. Pocahontas prices have not been established for October but no material increase is expected. Anthracite prices are expected to remain the same during October as they are at present. All in all the market, as viewed from Chicago, is healthy and nobody is complaining.

In southern Illinois fields there seems to be an epidemic in the demand for lump coal, especially from the Williamson and Franklin County fields. In the last week egg has begun to move, but the mines are oversold on lump for a month or longer. Egg is now oversold for a week ahead. Nut is slow and screenings are not moving. Railroad tonnage and train movement are good. Mines are getting from three to five days a week. All mines have "no-bill" screenings and nut on track. The Mt. Olive field has picked

up with a snap. Domestic coal is moving and the railroads seem to be taking the egg and nut sizes. Screenings are going on contract. In the Standard field the operators are always getting selfish. They are giving their screenings away at 75c. and expect to get \$2.50 or \$2.75 for 2-in. lump when Mt. Olive 6-in. can be bought for the same price.

St. Louis domestic business continues good. This is principally on Carterville grades, although Mt. Olive is coming in strong. Standard is not in demand yet. Anthracite is moving fairly well. Smokeless is showing up better and coke is active. Wagonload steam business is beginning to appear while carload steam is still slow. Country domestic is good but country steam demand is negligible.

## Kentucky Is Busy Too

Movement of coal from the western Kentucky fields continues heavy and at firm prices, with a slight increase in the minimum price on egg and lump from \$2.50 to around \$2.60. The top on these sizes is \$2.75. Block is \$2.75@ \$3. The market is quoted at 85c. to a dollar on screenings. Demand for prepared sizes is so heavy that operating mines are having no trouble in disposing of production. One of the difficulties is in getting proper equipment, flat bottoms being scarce.

All Kentucky demand is strong on prepared sizes, especially the larger ones; though screenings are weaker in

## Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern		Market Quoted	Oct. 1 1923	Sept. 15 1924	Sept. 22 1924	Sept. 29 1924†
Smokeless lump.....	Columbus.....		\$6.10	\$3.60	\$4.10	\$4.00@ \$4.25
Smokeless mine run.....	Columbus.....		3.10	2.00	2.10	2.00@ 2.25
Smokeless screenings.....	Columbus.....		2.35	1.20	1.20	1.15@ 1.30
Smokeless lump.....	Chicago.....		6.10	3.85	3.85	3.75@ 4.00
Smokeless mine run.....	Chicago.....		2.85	1.90	1.90	1.85@ 2.00
Smokeless screenings.....	Cincinnati.....		6.10	3.85	3.85	4.00
Smokeless lump.....	Cincinnati.....		2.75	1.85	1.85	2.00
Smokeless mine run.....	Cincinnati.....		1.85	1.35	1.10	1.15@ 1.25
Smokeless screenings.....	Cincinnati.....		4.80	4.15	4.20	4.20@ 4.35
Clearfield mine run.....	Boston.....		2.20	1.90	1.90	1.45@ 2.35
Cambria mine run.....	Boston.....		2.85	2.25	2.30	2.00@ 2.75
Somerset mine run.....	Boston.....		2.35	2.05	2.05	1.75@ 2.50
Pool 1 (Navy Standard).....	New York.....		3.25	2.75	2.75	2.50@ 3.00
Pool 1 (Navy Standard).....	Philadelphia.....		3.25	2.40	2.40	2.50@ 2.90
Pool 1 (Navy Standard).....	Baltimore.....			2.60	2.60	2.25@ 2.85
Pool 9 (Super. Low Vol.).....	New York.....		2.50	2.10	2.10	1.80@ 2.35
Pool 9 (Super. Low Vol.).....	Philadelphia.....		2.60	2.15	2.15	1.95@ 2.35
Pool 9 (Super. Low Vol.).....	Baltimore.....		2.40	1.85	1.85	1.80@ 1.90
Pool 10 (H.Gr. Low Vol.).....	New York.....		2.10	1.80	1.85	1.70@ 2.00
Pool 10 (H.Gr. Low Vol.).....	Philadelphia.....		2.15	1.75	1.75	1.65@ 1.90
Pool 10 (H.Gr. Low Vol.).....	Baltimore.....		2.25	1.60	1.65	1.60@ 1.70
Pool 11 (Low Vol.).....	New York.....		1.85	1.60	1.60	1.50@ 1.75
Pool 11 (Low Vol.).....	Philadelphia.....		1.85	1.45	1.45	1.35@ 1.60
Pool 11 (Low Vol.).....	Baltimore.....		2.00	1.45	1.55	1.50@ 1.60
High-Volatile, Eastern		Market Quoted	Oct. 1 1923	Sept. 15 1924	Sept. 22 1924	Sept. 29 1924†
Pool 54-64 (Gas and St.).....	New York.....		1.75	1.50	1.50	1.40@ 1.65
Pool 54-64 (Gas and St.).....	Philadelphia.....		1.75	1.50	1.50	1.40@ 1.60
Pool 54-64 (Gas and St.).....	Baltimore.....		1.60	1.35	1.40	1.35@ 1.50
Pittsburgh ac'd gas.....	Pittsburgh.....		2.55	2.40	2.40	2.30@ 2.50
Pittsburgh gas mine run.....	Pittsburgh.....		2.25	2.10	2.10	2.00@ 2.25
Pittsburgh mine run (St.).....	Pittsburgh.....		2.05	1.85	1.85	1.75@ 2.00
Pittsburgh slack (Gas).....	Pittsburgh.....		1.25	1.35	1.25	1.10@ 1.20
Kanawha lump.....	Columbus.....		3.15	2.10	2.10	2.00@ 2.25
Kanawha mine run.....	Columbus.....		1.85	1.40	1.40	1.30@ 1.55
Kanawha screenings.....	Columbus.....		1.05	1.05	1.05	1.10@ 1.20
W. Va. lump.....	Cincinnati.....		3.50	2.30	2.35	2.50@ 2.75
W. Va. gas mine run.....	Cincinnati.....		1.75	1.45	1.50	1.50@ 1.75
W. Va. steam mine run.....	Cincinnati.....		1.75	1.35	1.35	1.35@ 1.60
W. Va. screenings.....	Cincinnati.....		1.10	1.05	.90	.90@ 1.00
Hooking lump.....	Columbus.....		3.10	2.40	2.50	2.40@ 2.65
Hooking mine run.....	Columbus.....		1.85	1.55	1.55	1.50@ 1.75
Hooking screenings.....	Columbus.....		1.05	1.15	1.15	1.00@ 1.15
Pitts. No. 8 lump.....	Cleveland.....		2.60	2.30	2.35	2.00@ 2.75
Pitts. No. 8 mine run.....	Cleveland.....		1.95	1.85	1.80	1.85@ 1.90
Pitts. No. 8 screenings.....	Cleveland.....		1.15	1.15	1.15	1.10@ 1.25
Midwest		Market Quoted	Oct. 1 1923	Sept. 15 1924	Sept. 22 1924	Sept. 29 1924†
Franklin, Ill. lump.....	Chicago.....		\$4.05	\$3.35	\$3.35	\$3.25@ \$3.50
Franklin, Ill. mine run.....	Chicago.....		2.85	2.35	2.35	2.25@ 2.50
Franklin, Ill. screenings.....	Chicago.....		1.30	1.65	1.35	1.25@ 1.50
Central, Ill. lump.....	Chicago.....		3.10	2.60	2.85	2.75@ 3.00
Central, Ill. mine run.....	Chicago.....		2.10	2.20	2.20	2.15@ 2.25
Central, Ill. screenings.....	Chicago.....		.95	1.45	1.15	1.10@ 1.25
Ind. 4th Vein lump.....	Chicago.....		3.35	2.85	3.10	3.00@ 3.25
Ind. 4th Vein mine run.....	Chicago.....		2.60	2.35	2.35	2.25@ 2.50
Ind. 4th Vein screenings.....	Chicago.....		1.25	1.60	1.35	1.25@ 1.50
Ind. 5th Vein lump.....	Chicago.....		2.50	2.50	2.60	2.50@ 2.75
Ind. 5th Vein mine run.....	Chicago.....		2.10	2.10	2.10	2.00@ 2.25
Ind. 5th Vein screenings.....	Chicago.....		1.05	1.45	1.25	1.20@ 1.35
Mt. Olive lump.....	St. Louis.....		3.00	2.75	3.00	2.75@ 3.00
Mt. Olive mine run.....	St. Louis.....		2.25	2.50	2.50	2.50
Mt. Olive screenings.....	St. Louis.....		1.25	1.75	1.25	1.25
Standard lump.....	St. Louis.....		2.80	2.55	2.75	2.75@ 3.00
Standard mine run.....	St. Louis.....		2.05	1.80	1.80	1.75@ 1.85
Standard screenings.....	St. Louis.....		.55	.95	.95	.75@ .90
West Ky. lump.....	Louisville.....		2.55	2.60	2.85	2.75@ 3.00
West Ky. mine run.....	Louisville.....		1.85	1.60	1.65	1.50@ 1.80
West Ky. screenings.....	Louisville.....		.75	1.00	1.00	.85@ 1.00
West Ky. lump.....	Chicago.....		2.60	2.45	2.70	2.75@ 3.00
West Ky. mine run.....	Chicago.....		1.95	1.60	1.65	1.35@ 1.95
South and Southwest		Market Quoted	Oct. 1 1923	Sept. 15 1924	Sept. 22 1924	Sept. 29 1924†
Big Seam lump.....	Birmingham.....		3.75	3.10	3.10	2.50@ 3.25
Big Seam mine run.....	Birmingham.....		1.95	1.75	1.60	1.50@ 1.75
Big Seam (washed).....	Birmingham.....		2.35	2.00	1.85	1.75@ 2.25
S. E. Ky. lump.....	Chicago.....		3.35	2.50	2.85	2.75@ 3.00
S. E. Ky. mine run.....	Chicago.....		2.25	1.60	1.60	1.50@ 1.75
S. E. Ky. lump.....	Louisville.....		3.25	2.50	3.00	2.75@ 3.25
S. E. Ky. mine run.....	Louisville.....		2.00	1.50	1.55	1.35@ 1.75
S. E. Ky. screenings.....	Louisville.....		1.05	.90	.90	.85@ 1.00
S. E. Ky. lump.....	Cincinnati.....		3.60	2.50	2.60	2.50@ 3.00
S. E. Ky. mine run.....	Cincinnati.....		1.60	1.45	1.50	1.35@ 1.75
S. E. Ky. screenings.....	Cincinnati.....		1.00	1.05	1.00	.90@ 1.10
Kansas lump.....	Kansas City.....		4.50	4.50	4.50	4.50
Kansas mine run.....	Kansas City.....		3.20	3.50	3.25	3.00@ 3.50
Kansas screenings.....	Kansas City.....		2.60	2.50	2.35	2.35

\* Gross tons, f.o.b. vessel, Hampton Roads.

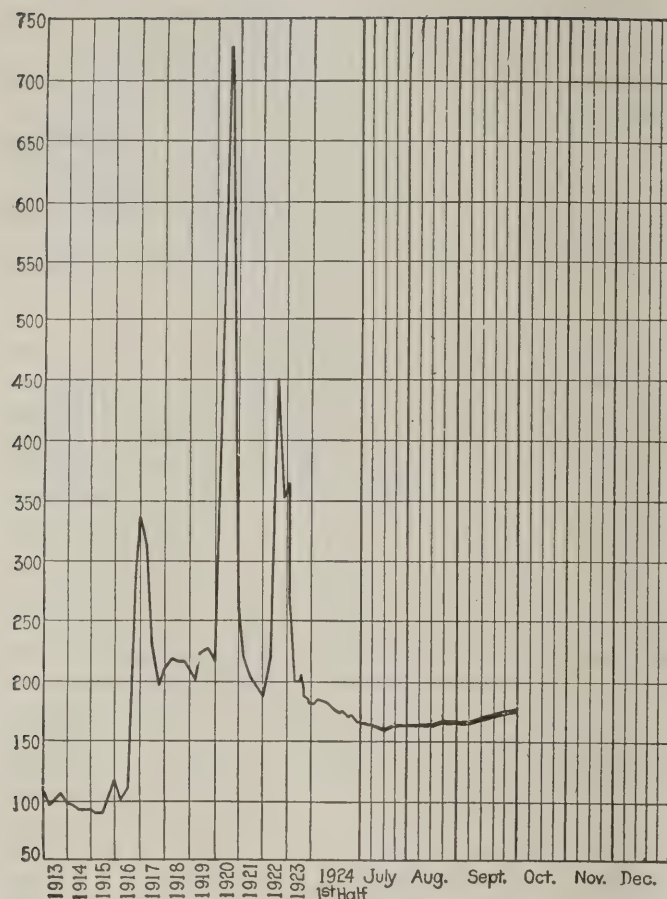
† Advances over previous week shown in heavy type, declines in italics.

## Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

		Market Quoted	Freight Rates	Oct. 1, 1923		Sept. 22, 1924		Sept. 29, 1924†	
				Independent	Company	Independent	Company	Independent	Company
Broken.....	New York.....		\$2.34	\$9.60@	\$12.25	\$8.00@	\$9.25	\$8.00@	\$9.25
Broken.....	Philadelphia.....		2.39				9.15		9.15
Egg.....	New York.....		2.34	9.85@	12.25	8.75@	9.25	\$9.00@	\$9.50
Egg.....	Philadelphia.....		2.39	9.85@	12.20	8.75@	9.25	9.00@	9.70
Egg.....	Chicago*.....		5.06	9.60@	12.50	8.00@	8.35	8.17@	8.27
Stove.....	New York.....		2.34	9.85@	12.25	8.75@	9.25	9.25@	10.00
Stove.....	Philadelphia.....		2.39	9.85@	12.20	8.90@	9.25	9.35@	10.00
Stove.....	Chicago*.....		5.06	9.60@	12.50	8.00@	8.35	8.63@	8.75
Chestnut.....	New York.....		2.34	9.85@	12.25	8.75@	9.25	9.00@	9.50
Chestnut.....	Philadelphia.....		2.39	9.85@	12.20	8.90@	9.25	9.15@	9.25
Chestnut.....	Chicago*.....		5.06	9.60@	12.50	8.00@	8.35	8.26@	8.40
Pea.....	New York.....		2.22	6.75 @	7.50	6.15@	6.65	5.25@	5.50
Pea.....	Philadelphia.....		2.14	6.75 @	9.00	6.35@	6.60	5.75@	6.25
Pea.....	Chicago*.....		4.79	6.00 @	6.75	5.40@	6.05	5.13@	5.45
Buckwheat No. 1.....	New York.....		2.22	2.65 @	3.50	3.50		2.25@	2.90
Buckwheat No. 1.....	Philadelphia.....		2.14	3.00 @	3.50	3.50		2.50@	3.00
Rice.....	New York.....		2.22	2.15 @	2.50	2.50		1.95@	2.25
Rice.....	Philadelphia.....		2.14	2.00 @	2.50	2.50		2.00@	2.25
Barley.....	New York.....		2.22	1.15 @	2.50	1.50		1.25@	1.50
Barley.....	Philadelphia.....		2.14	1.50		1.50		1.50	
Birdseye.....	New York.....		2.22			1.60		1.60	

\* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.





Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

	1924			1923
	Sept. 29	Sept. 22	Sept. 15	Oct. 1
Index .....	170	169	167	196
Weighted average price .....	\$2.06	\$2.04	\$2.02	\$2.37

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board.

price, demand is good considering present production, as a lot of large steam buyers are now stocking up fall supplies. The general belief is that the market is fairly close to the top for the time being. Eastern Kentucky hasn't any cause for complaint with a good car supply, low production cost and good prices. Non-union mines in western Kentucky are making some money, and union mines paying the full wage scale can make a little money at the present market.

Retailers in Louisville have advanced prices 50c. a ton on prepared sizes, due to the steady advance in mine prices, and report that business is good.

### Northwest Is Not Rushed

Coal business throughout the Northwest eased along during the week without any striking high lights, but domestic movement continued strong. At the Head-of-the-Lakes prices were unchanged throughout the list but a drop is imminent partly because of the steam situation. Heavy recent rains have amassed water power that is expected to replace some steam coal. Big surpluses of screenings, especially of Pocahontas coal, have piled up as a result of extensive business in the domestic sizes.

Thirty-one cargoes, five of them hard coal, arrived at Duluth last week. Sixteen are reported on the way, and of these four are hard. There seems to be no possibility of a shortage there this year, and in fact shipments may be materially reduced as a result of the torrential rains. There is a big demand for anthracite, and Duluth is shipping to the Dakotas and to Winnipeg. It seems certain that Winnipeg will be fed from Duluth all winter.

Twin Cities steam buyers are holding hard to their policy

of refusing to buy beyond immediate needs. The new situation with a 28c. increase on rates from southern Illinois to the Twin Cities places quite a handicap on coal from that region. But the suspension of rates for central and northern Illinois and from Indiana, until Jan. 8, gives those districts a chance to go after business formerly going to southern Illinois, and they are doing it. So the dock trade is not getting the Twin City and surrounding territory for its own as a result of the recent advance in rates.

Twin Cities quotations remain about as they have been. Southern Illinois lump is \$3.25 with screenings \$1.50@1.75. Western Kentucky lump is \$2.50@2.75, and screenings 90c. @ \$1. Indiana lump is \$2.75, and screenings \$1.50. Dock prices are on the same basis as before. Anthracite egg is \$13.20; nut, \$13.45 and stove, \$13.60. Lignite is coming to the district in a much reduced quantity.

The Milwaukee coal trade is experiencing a weather market. The spurt of last week has been followed by a slackening demand. However, a fair movement from the docks is reported. There is a demand for Pocahontas which is hard to meet because the mines are sold up for September and October and Pocahontas has advanced 50c. West Virginia splint also is wanted, and hard to get. Receipts of coal by lake at Milwaukee up to Sept. 24 aggregate 566,454 tons of anthracite and 1,586,210 tons of bituminous coal, a total of 2,152,664 tons. This record for both grades is 514,519 tons below 1923 for the same period.

### West Is Stimulated

Southwestern domestic grades took a pronounced jump during the week, while steam slumped. Operators say the domestic demand would justify opening more mines, if the industrial market were stronger. As a result only a few mines are being reopened. No price changes have been made though some operators are quoting Arkansas screenings as low as \$1 a ton while the current quotation is \$2.

In Colorado the market is much better, thanks to cooler weather. The average working time of the mines in that district last week advanced to twenty-eight hours with only 30 per cent of the working time lost due to "no market." Prices have not changed.

In Utah a cold snap has stimulated demand. Retailers have been working overtime for several days. Salt Lake City's coal yards now have about 50,000 tons on hand. Retail prices are still unsettled. The next increase will doubtless be 50c. a ton on large sizes and 25c. on intermediate sizes. Operators say the consumer business is improving in Idaho and Nevada.

### Ohio Markets Developing Strength

Domestic inquiry and purchases continue strong at Cincinnati. Some October prices have appeared that are much above spot figures. Some Hazard output is quoted at \$3 for block, \$2.50 for egg, \$2.25 for 2-in. and \$1.75 for run of mine. West Virginia offerings also have been advanced. Steam coals, generally speaking, are hanging back and slack has shown signs of softening. Much strength pervades the low-volatile division, though screenings are rather soft. Lake buyers are still in evidence, but no longer are in command. River business still lags because of conditions in the Kanawha fields, the low stage of the water and labor trouble among towboat men. Retail prices are unchanged, most of the dealers waiting to see what happens to the prices after Oct. 1.

Domestic trade at Columbus continues to improve steadily. Demurrage domestic coal is being reduced as the trade improves. Steam buying is haphazard, the larger users buying on the open market. Utilities are good consumers and a good tonnage also is going to public institutions and schools. Railroad consumption is only fair, but some lines of general manufacturing are showing a better buying spirit. Quite a few of the larger mines are being put into commission after lengthy idleness. The lake trade is steady with a fair tonnage moving.

Demand in eastern Ohio was strong enough last week to result in the largest week's output since March, but steam buyers are not in the market to the extent they should be at this time. The domestic market has been so active that spot quotations at Cleveland on Pocahontas and other smokeless fuels have risen 75c. to \$1 per ton. Practically no change is noted in spot prices on steam coals, f.o.b. Ohio mines. Ohio mines are having much difficulty in competing with non-union fields. Increased demand has not



thus far had any appreciable effect on prices. General railroad traffic is steadily increasing. Lake shipping is nearly a finished job, so far as this season is concerned.

Pittsburgh Still Below Normal

Shipments of domestic coal are increasing at Pittsburgh, but the movement is hardly up to normal. Slack is much weaker and quotations are off fully 10c. a ton, following a 10c. decline a week ago. Other prices are unchanged. Reports of the steel trade are of lighter buying of steel and a tendency among mills to reduce operations.

Production in the central Pennsylvania field is increasing, 13,910 cars having been loaded during the week ending Sept. 20, as compared with 13,303 the week previous. "No-bill" cars amount to 1,500. Prices at the mines are as follows: Pool 18, \$1.60@\$1.65; Pool 11, \$1.65@\$1.70; Pool 10, \$1.80@\$2; Pool 9, \$2.10@\$2.20; Pool 71, \$2.25@\$2.35; Pool 1, \$2.40@\$2.55.

The situation at Buffalo grows more quiet from nearly all sides. The demand for slack, which was producing a slightly better price, has fallen off. The attempt to change from anthracite to smokeless coal is not likely to amount to more than a wedge this year. Quotations are about as usual.

Spectacular Recovery in New England

The tidewater bituminous market at Boston has undergone a spectacular recovery, quotations for pool 1 New River and Pocahontas moving from the lowest figure since pre-war days to the highest that has obtained for several months, all within the week. This advance is directly due to a firming in spot prices at the southern loading piers. Demand for coal at Boston also has expanded considerably. At Mystic Wharf discharging ran up to 7,000 tons per day and about an equal tonnage has been discharged at the privately owned wharves. All of the dischargings at Mystic Wharf have gone out to consumers.

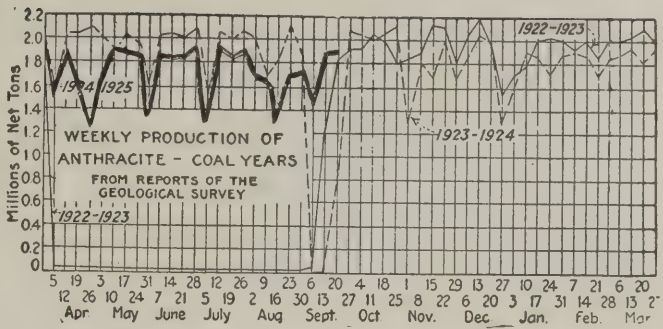
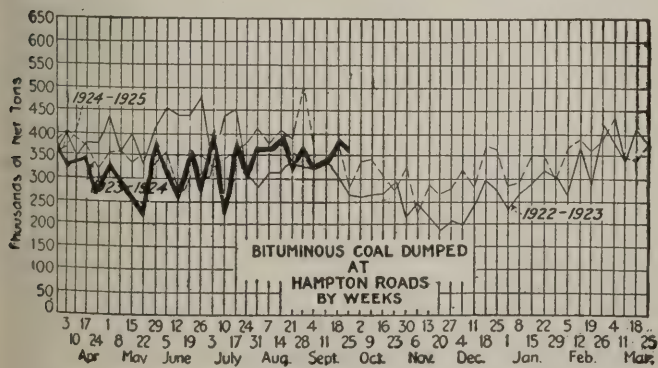
Prices have not undergone much improvement at Providence as yet, some tonnage still being available at \$5.30 on cars but that market has been on a higher level than Boston all along.

There also has been a little more action in Pennsylvania steam coal. Some fair business is reported, at good prices, up to \$2.50 net ton mine being obtained for medium volatile coal. Indications are not very promising for any marked expansion in rail coal, for tide coal still has the edge on price.

uying Heavier in Atlantic Markets

Increased buying at New York is indicated by a heavier movement of coal and an increase in inquiries. Incidentally two cargoes of Southern coal arrived here recently consigned to utilities. Reserve stocks are dwindling rapidly toward the danger point should there be any transportation trouble or a shortage of cars. Contract coals are moving better and contract holders are taking larger shipments. Tidewater movement is fair but prices remain about stationary. There is little free Pool 1 coal to be had.

Tonnage is moving better at Philadelphia. Stocks at manufacturing plants, except the utilities, are exceedingly low, but these concerns are buying more than current requirements. Industrial conditions are improving at an increasing pace. More contract coal is moving. On the B. & O. R.R. there is a shortage of cars. There has been more inquiry for contract prices lately and some additional tonnage has been closed for delivery between now and



April 1. Users of gas slack, principally cement manufacturers, have been taking some tonnages of late.

Inquiry at Baltimore continues to grow. Not only is the home market encouraging, but export movement has increased. Buying of industrial coals for storage is coming from the smaller industries. A demand is developing for some of the pools which have been practically stagnant for a number of weeks past.

Gradual expansion continues at Birmingham with small concerns starting up or making better time, which is tending to increase fuel requirements. The cotton-ginning season and activity at oil mills is consuming additional tonnage, and there is a good scattering of spot business. The railroads are increasing the tonnage taken on contracts as transportation conditions improve. Bunker and export trade is still slow.

Anthracite Gaining Headway

Demand is active at New York for anthracite, consumers endeavoring to fill their bins while movement is good. Independent coals are in good demand and the old-line companies are not having any trouble in moving their output. The call for stove is heavy, although chestnut has picked up considerably and is now in remarkably good shape for the New York market. Some of the smaller producers are well sold up on all of the larger sizes and are reluctant to book orders for straight stove coal. Egg also is in fair shape. The call for pea coal is slow but there is no difficulty experienced to move it. Buckwheat No. 1 shows more strength, with rice and barley moving readily.

The slow, steady accretion of business by Philadelphia retailers goes on, helped by cool weather. Stove is in increased demand. Company producers are close to sold up on the larger sizes, with pea the only slow moving size, and this showing more strength. Egg is going a trifle better with all shippers. Retail prices are moving upward. Steam sizes show considerable improvement.

Baltimore dealers report a fair amount of orders, but the volume is not at all commensurate with conditions created by the failure to store over the summer months in the usual amount. Coal men are hoping for an early cold snap to stimulate orders and allow them to get in a fair proportion of this coal before steady cold weather sets in.

Trade at Buffalo shows no tendency to recover as sunny days continue. The independent anthracite trade is quiet. Shippers are holding prices firm at about \$1 above the line prices. Chestnut and stove are most active. Furnace and the small sizes are very slow.

Demand in the Connellsville coke market is very light. Prices, however, show much stiffness, and this is clearly traceable to fear on the part of independent operators that their wage scales, in most cases about one-third below the Frick scale, may be difficult to hold if the Frick company should increase its operations much. Spot furnace coke remains quotable at \$3@\$3.10. Foundry coke continues in poor demand, but prices hold without any difficulty, production being very limited and operators quite indisposed to try to increase operations by cutting prices. Spot foundry remains at \$4@\$4.50, according to brand.

Car Loadings, Surpluses and Shortages

	Cars Loaded	
	All Cars	Coal Cars
Week ended Sept. 13, 1924.....	1,061,424	182,315
Previous week.....	920,979	149,473
Week ended Sept. 15, 1923.....	1,060,563	171,875

	Surplus Cars		Car Shortage	
	All Cars	Coal Cars		
Sept. 14, 1924.....	167,157	84,197		
Sept. 7, 1924.....	194,306	97,089		
Sept. 15, 1923.....	69,080	19,790	12,245	6,478



## Foreign Market And Export News

### British Market Dull with Inland and Export Demand Far Below Normal

Shipments of Welsh coal of late have been slightly heavier than during July and August though the prospects on the whole are anything but bright. The inland trade has not expanded and export demands remain considerably short of normal proportions. On an output of slightly over a million tons per week, 10 per cent short of the total of some months ago, there are enormous stocks of coal, consisting chiefly of large coal of secondary and lower grades, and of vast quantities of small coal.

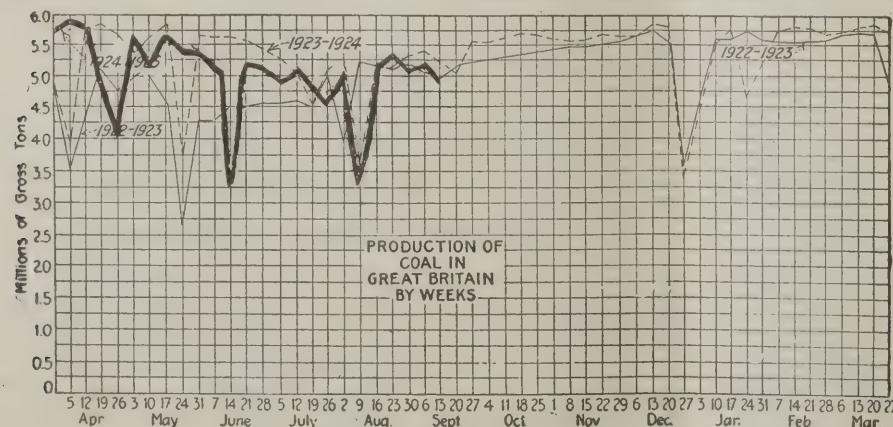
The superior Admiralty classes of coal remain scarce because of the closing of the Cambrian collieries several weeks ago. The result is that qualities are able to maintain prices fairly well. Further shutdowns are feared because of the unremunerative working conditions, the small Continental demand and the fact that Germany is successfully competing for the markets.

The Newcastle market is still in a deplorable condition and export business is very difficult to obtain. German competition in Europe is severely felt. Several Continental gas works are taking quantities up to 20,000 tons at prices averaging 26s. 6d., per ton, and Riga merchants are inviting offers of 25,000 tons of steam coals for shipment this year.

Coal output by British collieries during the week ended Sept. 13, a cable to *Coal Age* states, was 4,907,000 tons, according to the official reports. This compares with a production of 5,180,000 tons during the week ended Sept. 6.

#### Hampton Roads Market Active; Prices Stronger

Hampton Roads reports the best business of the last six months, with the market stiffening and with demand becoming more insistent day by day. Coastwise movement is consuming the bulk of the thought of the trade, together with Western demand and bunkers.



Shippers who were unable to dispose of mine-run coal two or three weeks ago at \$1.60 net ton mines, were unable last week to fill orders for the same at less than \$1.75. Some New England buyers were in the market offering \$4.25 net ton piers for pool 1. High-volatile coal generally was quoted \$4.10 @ \$4.15 at the pier for October delivery.

#### French House Coals More Active; British Imports Slump

The French industrial coal market continues dull but stocks are not of large volume. Business in house coals, however, is increasingly active.

Due to the high level of prices in South Wales, there has been a progressive falling off in imports of British coals. For the same reason smokeless patent fuel is being extensively made and tested in the Paris plants.

The prices of French sized coals for October are unchanged from those of September, ovoids alone being reduced to 117.20f. per ton.

Offers of German coal continue numerous in the open market, but deliveries are slow.

The supply of rolling stock both at the mines and at Rouen has left much to be desired and arrivals have been delayed. In Belgium the crisis is already very acute and threatens to be critical when the transport of the beet crop is in full swing.

Deliveries of indemnity fuels thus far in September have been at a daily average rate of 31,600 tons, as against 28,600 tons per day in August.

Coke deliveries to the O.R.C.A. during the first eleven days of September totaled 145,797 tons, or at the rate of 9,100 tons a day. The price of reparation coke probably will remain unaltered this month at 145.25f. delivered frontier station Sierck, O.R.C.A.'s charges excluded. Although no official statement has been made, it is re-

ported from an authoritative source that the Belgian price of reparation coke is reduced from 146 to 135f. (135 Belgian francs being equal to 126 French francs).

The situation in the Belgian coal market is unfavorable owing to acute foreign competition. The falling off in sales of industrial coals has led to larger price concessions. There has been a fair demand for half-bituminous sized coals, both in the Center and Charleroi coal fields. In dry duffs trading is satisfactory.

#### Export Clearances, Week Ended Sept. 27, 1924

FROM HAMPTON ROADS		Tons
For Brazil:		
Br. Str. Cape Comoria for Rio de Janeiro	.....	6,909
Br. Str. Clydemede for Rio de Janeiro	.....	6,026
For Canada:		
Ger. Str. Bolheim for Montreal	.....	2,593
For Cuba:		
Nor. Str. Vindegen for Santiago	.....	1,190
For Italy:		
Ital. Str. Satsuma for Porto Ferrajo	.....	7,003
For Malta:		
Ital. Str. Albert No. 8	.....	2,079
For West Indies:		
Fr. Str. Caid for St. Pierre	.....	1,197
Br. Str. Chiswick for Barbados	.....	4,880
Amer. Schr. Mary G. Maynard for Hamilton	.....	1,062
Nor. Str. Jacob Christensen for Curaçao	.....	5,364

#### FROM BALTIMORE

For Cuba:	
Amer. Schr. Dolly Madison, for Caibarien	..... 2,323
For Canada:	
Nor. S.S. Sirrah, for Corner Brook	..... 4,447
For Porto Rico:	
Amer. Str. Delisle, for Quanca (Coke)	..... 531

#### FROM PHILADELPHIA

For Cuba:	
Dan. Str. Betty Maersk, for Havana	.....

#### Hampton Roads Pier Situation

N. & W. Piers, Lamberts Pt.:	Sept. 18	Sept. 25
Cars on hand	1,447	1,249
Tons on hand	92,367	87,589
Tons dumped for week	122,868	100,419
Tonnage waiting	2,000	12,000
Virginian Piers, Sewalls Pt.:		
Cars on hand	1,704	1,271
Tons on hand	111,100	87,150
Tons dumped for week	83,230	119,855
Tonnage waiting	13,038	2,900
C. & O. Piers, Newport News:		
Cars on hand	2,040	1,996
Tons on hand	105,865	104,210
Tons dumped for week	136,501	97,188
Tonnage waiting	1,075	4,640

#### Pier and Bunker Prices, Gross Tons


PIERS		Sept. 20	Sept. 27
Pool 9, New York	\$4.60 @ \$5.00	\$4.75 @ \$5.05	
Pool 10, New York	4.50 @ 4.75	4.60 @ 4.75	
Pool 11, New York	4.35 @ 4.50	4.35 @ 4.60	
Pool 9, Philadelphia	4.90 @ 5.25	4.90 @ 5.25	
Pool 10, Philadelphia	4.45 @ 4.70	4.45 @ 4.70	
Pool 11, Philadelphia	4.30 @ 4.50	4.30 @ 4.50	
Pool 1, Hamp. Roads	4.10 @ 4.25	4.25	
Pool 2, Hamp. Roads	3.90 @ 4.00	4.00	
Pools 5-6-7 Hamp. Rds	3.85	3.90 @ 4.00	
BUNKERS			
Pool 9, New York	\$4.90 @ \$5.30	\$5.00 @ \$5.30	
Pool 10, New York	4.80 @ 5.05	4.85 @ 5.00	
Pool 11, New York	4.65 @ 4.80	4.60 @ 4.85	
Pool 9, Philadelphia	4.90 @ 5.25	4.90 @ 5.25	
Pool 10, Philadelphia	4.75 @ 4.95	4.75 @ 4.95	
Pool 11, Philadelphia	4.50 @ 4.70	4.50 @ 4.70	
Pool 1, Hamp. Roads	4.10 @ 4.25	4.25	
Pool 2, Hamp. Roads	4.00 @ 4.10	4.00	
Pools 5-6-7 Hamp. Rds.	3.90	4.00 @ 4.15	

#### Current Quotations British Coal f.o.b. Port, Gross Tons


Quotations by Cable to <i>Coal Age</i>		Sept. 20	Sept. 27
Cardiff:			
Admiralty, large	28s. @ 28s. 6d.	27s. 6d.	
Steam smalls	15s. @ 15s. 6d.	15s. 3d.	
Newcastle:			
Best Steams	19s. @ 24s.	19s.	
Best Gas	21s. @ 22s.	22s.	
Best Bunkers	19s.	18s. 6d.	

Advances over previous week shown in heavy type, declines in *italics*.





## News Items From Field and Trade



### ALABAMA

Chas. F. DeBardeleben, Jr., who has been superintendent of the Overton Mines of the Alabama Fuel & Iron Co., has been appointed general manager in charge of physical properties and operations.

The Southern Ry. will soon begin the construction of a new coal chute at Selma, to cost in the neighborhood of \$50,000, replacing one burned some time ago, according to announcement made by H. A. Debutte, superintendent of the Mobile division of the Southern Ry.

E. F. Powelson and a staff of engineers have arrived in Birmingham preparatory to beginning construction on the large plant of the Hercules Powder Co. to be built on a large tract of land at McAdory, near Bessemer. It is stated that the plant will have a capacity of 1,250,000 lb. of dynamite monthly and will be the most modern of its kind in the country.

In line with the rehabilitation of service on the Warrior River and the provision of additional equipment for the movement of coal and other freight to and from Mobile and other gulf ports, officials of the Inland Waterways plan to buy from the Tennessee Coal, Iron & R.R., 28 barges owned by the latter for a consideration of about \$600,000.

J. M. Cobb, for the past several years foreman in charge of the Birmingham station of the U. S. Bureau of Mines, has accepted a position with the DeBardeleben Coal Corporation as safety inspector at all works of the company.

The Red Star mine, on the properties of the Nelson Coal Corporation, recently acquired by the Pratt Fuel Corporation, which had been idle for some time, has resumed operations on a limited schedule.

Tentative arrangements have been made whereby the Ensley Southern Ry., formerly operated by the Southern Ry. system but recently thrown into the hands of a receiver, will be taken over and operated in connection with the Birmingham Southern R.R., a subsidiary of the Tennessee Coal, Iron & R.R. Co. The Ensley Southern affords Birmingham's only rail connection with Birminghamport, on the Warrior River large line, and its acquisition by the Birmingham Southern will be immensely important to the interests of the Tennessee company and other shippers of the district.

Reports from Jasper are to the effect that L. B. Baird, former Alabama board member of the United Mine Workers,

is sponsoring a movement to organize locals in the Walker County field to be affiliated with District No. 20, which lost its autonomy about a year ago when its ranks became so depleted that the district organization was not self-supporting and had practically ceased to function since the 1920 strike. Better working schedules and more satisfactory conditions have been maintained in Alabama working on an open-shop basis, and indications are that little sympathy will be accorded the movement for reorganization.

### ARKANSAS

The stripping plant of the C. C. & E. Coal Co. west of Clarksville has been bought by Winston Bros. Coal Co., of Minneapolis, Minn. W. O. Winston, Jr., is superintendent of the mine. It now employs 75 men and has a 1,000-ton capacity tippie. The new company has installed a Marion 350-ton electric shovel and it is announced locally that the plant is to be further expanded.

### COLORADO

An offering of \$50,000 joint closed first mortgage 7 per cent serial gold bonds of the Bell Coal Co. and the Bell Mining Co. was recently made at par and accrued interest. The bonds are dated Aug. 1, 1924, and are due \$5,000 annually, 1926-35. The bonds are secured by the total assets of the companies and guaranteed as to principal and interest by the personal indorsement of R. M. Head and J. H. Head. The issue will finance expansion and improvement of the properties and business. The Bell Mining Co. owns and operates the Eureka mine, in Boulder County.

James McKeown is now superintendent of the Bear Canon Coal Co. at Valloroso.

On Sept. 9 a fall of rock in the Turner No. 2 mine of the Calumet Fuel Co., of which he is superintendent, so badly injured James R. Cameron's left arm that it was necessary to amputate it immediately. His foot was broken also. The accident occurred when Mr. Cameron was directing a crew of men in timbering the rock. He saw it moving and shouted to the men in time for them to jump to safety, but was caught himself. Mr. Cameron is well known in Gallup, N. M., where he was employed as engineer and as superintendent by the Gallup-American Coal Co., and in Eckels, W. Va., where he was resident engineer for the Guggenheim interests.

### ILLINOIS

Austin N. Harloy has joined the Columbus Mining Co., of Chicago, to be in charge of the jobbing department and to handle the output of the company's two Indiana mines—the Bright Gem, at Jessup, and the Shamrock, at Riley.

Edward Leming has succeeded John Hayes as mine manager at the Kathleen mine of the Union Colliery Co., at Dowell, south of Duquoin. Hayes has accepted a similar position with a coal company at West Frankfort.

After working for 72 years in coal mines, John Egloff, of Murphysboro, has decided to "lay off" for his first rest. He is now 81 years of age and worked the greater part of his life in the old and now abandoned No. 9 Mine of the Consolidated Coal Co., at Murphysboro.

The Peabody Coal Co. will open its Mine No. 9, at Taylorville, this week. A new tippie has been constructed and other repairs made. About 500 men are employed.

A vein of coal 6½ ft. thick has been struck in the Coonsburg vicinity, near Lincoln, at a depth of 295 ft. This is approximately the same depth as the coal strata under Lincoln. The boring has been financed by farmers, but plans are being made to establish a wagon mine.

C. O. Wager, of the North Coal Co., states that his company is now operating its new mine on the North Main Street road, Kewanee. Coal is being mined from a 4-ft. vein which analyzes very well.

The Valley view coal mine, Coal Valley, has been reopened by its owners, Sackville and Wynn. The mine is now employing thirty-five men. It had been closed since last February.

Coal from the Rutland mine will be upon the market within the next two weeks. It has been over four years since this mine was operated. The Rutland mine was first worked more than thirty years ago and for many years was a prosperous operation.

A small mine is to be sunk on the Ferry farm south of Moline at once by the newly incorporated Highland Coal Co., of Rock Island, whose capital stock is \$25,000. Subscribers to \$11,000 of the stock are Henry Rohwedner, William Ferry; Louis Rohwedner, of Moline; Thomas Thompson, A. S. Thompson and Leroy Dehler, of Rock Island, and J. Hasper, of Cuba.



## INDIANA

New shaker screens, picking tables and loading booms have been installed in the old tippie at the Shamrock mine of the Columbus Mining Co. at Riley.

To satisfy a judgment for \$100,916.66 obtained by the National Bank of Kentucky, of Louisville, against the Big Four Coal Co., arrangements are being made to sell the Liberty mine of the company, near Francisco, with the coal rights, property and buildings. The sale is being arranged for Oct. 10.

Indiana's largest coal mine, American mine No. 1, near Bicknell, started hoisting coal again Monday, Sept. 22, after having been closed for about six months. Because of its size, this mine does not hoist unless conditions are such as to warrant a fair weekly average of working days.

The Standard mine, near Wheatland, is to reopen soon, after having been stopped all summer. The stoppage for lack of market was aggravated by labor trouble. The mine installed coal-loading machines and the men picked to run the machines were called out by the union local. It is said that an agreement has been reached whereby the mine can reopen. This mine's entire output goes to the B. & O. R.R. While it has been shut down the railroad has been using West Virginia coal.

A strike of fire and gas inspectors employed in the mines of the Knox Consolidated Coal Co. in the Bicknell field called for Sept. 22 failed to develop, and the two large mines owned by the company operated. The mines threatened with a tie-up were the Indian Creek, which has been operating with 400 men for about three months, and the American mine No. 1, which has been closed for several months, but had been scheduled to resume operations. The American mine is the largest in the state and it was announced it would employ about 900 men. The threatened strike followed a controversy which began about three months ago, when the company reduced the wages of firebosses 20 per cent. It is reported that the controversy has been settled. Had the inspectors carried out their intention to go on strike, 1,300 miners would have been held out of the mines. There is no rule in the wage agreement providing for a definite wage for these inspectors, the matter being left to agreement between the company and the firebosses.

Increased activity in the Terre Haute and Clinton coal fields in the last few days gives promise that a revival of

the Indiana bituminous industry is at hand. More mines are working now than at any time since last February and optimism for better times is reflected in both miner and operator circles. A controversy between the miners and officials of the Chicago, Milwaukee & St. Paul R.R. over work trains to carry miners from Terre Haute to the mines in the Clinton field has been adjusted after tying up work at several of the mines for a few days.

## KANSAS

W. Capen Shank, Pittsburg, president of the Carbon Coal Co. and identified with other coal interests, may again be a brother-in-law to a Missouri Governor. He held that relationship to Lon V. Stephens, who was Governor of Missouri a number of years ago. Another brother-in-law, Dr. Arthur W. Nelson, is the Democratic gubernatorial candidate in Missouri this fall.

John O'Leary and W. D. Van Horn, international board members of the United Mine Workers, sent into District 14 by President John L. Lewis to make a survey of conditions recommended that a corps of at least two organizers be sent into the field.

## KENTUCKY

The recently organized R. L. Brown Coal Co., Evarts, is planning the installation of electric equipment and mining machinery for the development of a portion of the 500-acre tract of land acquired from the Standard Harlan Coal Co.

W. D. Coil, of Madisonville, has acquired about 3,000 acres of coal land in Pond River County.

It is reported that the fire in the Himyar Coal Co. mines at Domino has finally been extinguished, after a long effort, and through assistance of the U. S. Bureau of Mines. In the original explosion and fire a foreman and two men were killed. When an effort was made later to start the mines the fire broke out afresh. The plant will open in a few days. It employs about 300 men and has a capacity of about 25 cars a day.

The Sandy Valley & Elkhorn Railway Co., belonging to the Consolidation Coal Co., and purchased from the Baltimore & Ohio R.R., in 1922, embracing 31 miles of road, from Shelby Junction, in Pike County, to Dunham, in Letcher County, is fighting an effort of the State Tax Commission to increase its tax assessment \$3,396,579 to \$9,395,113.

The Cumberland Straight Creek Coal Co., at Logan Switch, near Pineville,

lost a \$10,000 tippie by fire on the night of Sept. 11, just after announcement had been made of plans for resuming operations on Monday, Sept. 15, at a reduced scale of wages, the mines having been down since April, because the workers refused to accept the reduction. It is believed that the fire was a plain case of arson, and a reward has been offered by company officials for arrest and conviction of those responsible. The plant is not far from the mines of the Liberty Coal & Coke Co., where several miners were shot last spring, and which resulted in the camp being under military guard for some weeks.

The Hawley McIsaacs Coal Co., at St. Charles, has installed a second stripping shovel in its operation, and expects to produce about 500 cars of coal in September, it having produced close to 250 cars last month. In August the Morrison Coal Co., at Centertown, Ky., produced 549 cars by the strip process, and the Kershaw Coal Co., at the same place, stripped 480 cars.

## MARYLAND

Dr. J. J. Rutledge, chief mine engineer of the Maryland Bureau of Mines, and L. C. Hutson, director of vocational education of the Maryland Bureau of Mines, have established mining classes at Frostburg, Lonaconing, Westernport, Kitzmiller and Mount Savage. Plans also are being considered for classes in other mining sections of the state. The course consists of 33 lessons dealing with all the fundamental subjects relative to the mining of coal.

## MINNESOTA

According to the manager of the Ford coal dock in Duluth, about thirty Ford agents in the Northwest have ordered coal in carloads from the company. As there were notices sent out to 478 dealers, the response does not seem to be sufficiently large to represent any serious tonnage.

Just before the increased rate on coal from southern Illinois became effective, Walter H. Newton, of Minneapolis, representative from the Fifth Minnesota district, wired a protest to the Interstate Commerce Commission against the increased rates becoming effective, and asking their suspension and a reopening of the case. The rates took effect, however.

## MISSOURI

The Reed Coal Co., of Fulton, will start stripping coal on the Gohring farm, three miles west of Fulton, at once. The company's steam shovel will be used in the operations. About 26 acres of coal are to be taken out, J. F. Reed, head of the company said.

## NEW YORK

O. W. Seaberg has been elected a vice-president of the Steamship Fuel Corporation of New York City and will also continue his former duties as sales manager. Mr. Seaberg has been connected with this company for some time



**Hospital and Doctor's Office at Hanna, Wyo.**

This is one of the towns of the Union Pacific Coal Co. in a small coal field many miles east of Rock Springs.



and is well known to the coal trade. Other officers of the company are Sanders A. Wertheim, president, and J. J. Ferranto, vice-president. The Wyoming Valley Coal Co., of which Mr. Wertheim is the president, now has fourteen retail yards located in various cities. Of these three are in Brooklyn, two in far Rockaway, two in Newark, two in Cedarhurst, L. I.; and one each in Jamaica, Springfield, Mass.; Bradley Beach, N. J.; Long Branch, N. J., and Red Bank, N. J.

J. F. Birmingham, president of the Delaware, Lackawanna & Western Coal Co., has resigned as a director of the Delaware, Lackawanna & Western R.R. The vacancy was filled by the election of Charles C. Smith, of New York.

## OHIO

Owing to lack of demand the Elk Coal Co. mine at Roseville has been closed down indefinitely, throwing about 150 men out of employment.

Joe Darlington, general manager of the Cowan's Creek Coal Co. at Ice, Ky., with Alex Vowles, also of the operating end, were in Cincinnati recently conferring with the owners of these mines concerning further improvements to the mechanical equipment.

Fire of unknown origin recently totally destroyed the power house and boiler room of the Mid-Hocking Coal Co., at Corning, causing a loss of \$11,000. Steps will be taken to rebuild the power plant.

The Essex Coal Co., has put into operation the Lost Run and Jacksonville mines, which had been idle for some time.

The Northern Fuel Co., which has headquarters in Toledo and of which H. H. Heiner, Jr., is the head, has opened a Columbus office with W. S. Courtright, formerly with the New Pittsburgh Coal Co., in charge.

Mines of the North Hocking Co., near Murray City, employing about 125 men, are about to reopen. The mines have been shut down since last February.

## PENNSYLVANIA

The Logan Coal Co., Philadelphia, has removed to Rooms 1018-1022 Packard Building, 15th and Chestnut Streets.

Shamokin Coal Co., of New York, under Delaware laws increased its capital from \$1,500,000 to \$1,625,000.

Cornelius Brislin, treasurer of the Warrior Run local union of the United Mine Workers, is being held in the Luzerne County jail on a charge of embezzling the entire funds of the local, amounting to \$2,700.

Officials of the A. S. Van Wickles estate have announced that there has been no agreement reached in the proposal of the Lehigh Valley Coal Co. to buy the boundary pillars between the Beaver Meadow colliery of the Lehigh Valley and the Coleraine mines of the estate. Coleraine, which was started 83

years ago and which after being abandoned twice has made fortunes for three sets of operators, is about worked out. Robbing pillars was the chief method of gaining coal for years.

On the afternoon of Sept. 20 eighteen teams representing seventeen mines gave an exhibition near West Newton, of their excellent training at the first annual first-aid contest of the Pittsburgh Coal Co. First place was given to the team from Montour No. 9 mine, which nosed out the Champion mine team by a small margin, the scores being 98.39 and 98.28 per cent. The teams that participated were chosen from a field of 1,000 men who were trained last winter by instructors from the U. S. Bureau of Mines and local physicians. Final selections were made during three months of intensive training prior to the contest.

Resumption of operations at the Weston colliery of the Dodson operating interests after a strike that started July 21 has already boosted coal tonnage carried over the Hazleton and Mahanoy Division of the Lehigh Valley R.R.

The Lehigh Valley Coal Co., Lytle Coal Co., Lehigh Coal & Navigation Co. and Philadelphia & Reading Coal & Iron companies are named defendants in a suit instituted by J. Stanton Christ, of Berks county for alleged damages for coal dirt washed down the Schuylkill River upon his land.

Ten miners were injured, one perhaps fatally, at the Lance colliery of the Lehigh & Wilkes-Barre Coal Co. near Plymouth when a cage lowering them to work dropped 40 ft. to the bottom of the shaft. The accident occurred when the steam reverse refused to work.

A new washhouse and carpenter shop for the Glen Alden Coal Co. are under construction on the property adjacent to the Baker colliery, in the Bellevue section of Scranton. The washhouse will be a one-story structure of brick, steel and concrete 48 x 78 ft. in size. The carpenter shop will have concrete footings and floor, steel frame and corrugated-iron sidings and roof. It will be 40 x 60 ft. in size and one story high.

The Buckeye Coal Co., subsidiary of the Youngstown Sheet & Tube Co., at Nemacolin mine, is installing a skip hoist in the main slope and a turn-over cage at the material shaft for hoisting rock in solid end cars, which is all that will be used at that mine. An endless-rope car haul to feed the railroad cars past the tipples as they are loaded also is being installed. This is one of the most modern mines in western Pennsylvania, and since being sunk three or four years ago, has been operating with temporary hoisting equipment. This mine is at Nemacolin, Washington County, on the Monongahela River, about twenty miles above Brownsville, on the Pennsylvania R.R. The mine continues to operate while this work is being done.

Business is improving so much in the Connellsville coke region that the H. C.

Frick Coke Co., subsidiary of the United States Steel Corporation, has started up the Continental No. 1 plant, near Uniontown, firing 200 ovens, one-half of the ovens at the plant, which had been idle for several months. The Oliver & Snyder Steel Co. also has fired 100 ovens at each of its three plants near Uniontown, and the Lincoln Coal & Coke Co. has reopened its mine and blown in some of its ovens at Keister, between Brownsville and Uniontown. All of these plants had been idle for several months. The Vesta Coal Co., subsidiary of the Jones & Laughlin Steel Corporation, has resumed operations at its No. 6 mine, a union mine on the edge of the coke region, in Washington County, on the Monongahela River, after being idle for eight weeks.

Surveys are being made of the coal banks of the old Harleigh Brookwood Coal company's colliery at Harleigh now part of the Markle holdings, by James W. Boyle, of Freeland. His coal company, the Harleigh Coal company, has leased these and will run them through a washery for preparation for market of the small sizes contained in the banks. It is planned to erect frames, screens and buildings in the next month and to have things moving by the time the demand for small sized coal develops.

The Tri-District Board of the United Mine Workers, in session at Wilkes-Barre, recently decided to notify diamond drill operators and crews engaged that they must become members of the miners' union. It was declared that these men come under existing agreements and that they should be subject to union jurisdiction. About 80 of these men are employed in the three districts. The board also concurred in the recommendation of the American Federation of Labor indorsing La Follette and Wheeler and Congressional candidates approved by the independent party. Circular letters were ordered sent to all local unions in the anthracite districts urging the support of the La Follette-Wheeler ticket.

## TENNESSEE

The Liberty Coal Mining Co., 421 Decatur Street, Memphis, has increased its capital from \$75,000 to \$100,000.

The Richland Coal Co., Inc., of Dayton, of which E. M. Williamson is president, has mines under development at Soddy, near Montlake. Daily output is to be about 200 tons.

## TEXAS

L. W. Stephenson, of the U. S. Geological Survey, is in Texas for several months to be engaged in field studies of the upper Cretaceous and in work on the new state map.

## UTAH

William Littlejohn, general superintendent at Castle Gate for the Utah Fuel Co., suffered a broken leg in an automobile accident Sept. 10 while driving on the Park road near the head of Horse Creek canyon.



L. F. Rains, president of the Carbon Fuel Co., Salt Lake City, acted as grand marshal in the twilight parade in Salt Lake City on Defense Day.

Preparations are in progress for a resumption of operations by the King Coal Co., originally known as the Star mine, at Musselshell, within a short time. The property has not been worked for several months owing to the depressed condition of the coal market. A rearrangement of the surface plant is planned and it is reported that the management will place a considerable number of men on the payroll.

## VIRGINIA

The Norfolk office of the Logan County Coal Corporation, in charge of H. M. Fadley, will be moved to Richmond, Oct. 1.

## WASHINGTON

In the process of reorganizing the Corbin coal interests, the Corbin Coal & Coke Co., capital \$10,000,000, was permitted by the Superior Court at Spokane to dissolve on Sept. 9. The interests of the company have been taken over by Corbin Coals, Ltd., a British Columbia corporation with a capital of \$5,000,000, according to the concern's lawyers. Only part of the stock of the Corbin Coal & Coke Co. had been issued. The British Columbia corporation controls several coal mines in that province.

## WEST VIRGINIA

The principal office of the Oriole Coal Co. has been moved from Huntington, W. Va., to Pittsburgh, Pa. The New Howard Coal Co. has changed its principal office from Sprigg to Huntington.

Among West Virginia Coal companies that have surrendered their charters are the Candace Coal & Coke Co., the Colgate Coal Co. and the Virana Coal Co. The Penn-Mary Coal Co. has withdrawn from the state, mines formerly operated by it now being operated by the Bethlehem Mines Corporation.

The Buchanan Coal Co., at Buchanan, in the Fairmont region, with a normal output of about 2,000 tons per day, which has been idle for several months, started a small operation last week, at a reduced wage scale of about \$3.50 per eight-hour day for inside drivers, tracklayers, etc., and \$3 per day for outside labor.

Henry A. Phillips, of Pittsburgh, has increased his coal holdings in Clay district of Monongalia County through the acquisition of four tracts aggregating 285 acres of Pittsburgh coal. The undivided half interest in one tract of 160 acres, purchased from D. Richard White and wife, brought \$24,000 or about \$300 an acre; 30 acres on Jakes Run, \$6,048.75; 10 acres brought \$2,020, and 84 acres on Thomas Run brought \$16,885.80.

The Pond Creek Pocahontas Coal Co., subsidiary of the Island Creek Coal Co., of Holden, is putting in a new mine to tap 3,000 acres of Pocahontas

No. 4 coal which lies at a depth of 600 ft. on Dry Fork, McDowell County. A man shaft and a main shaft to be equipped with skips have already been sunk and a new tippie has been erected, though the latter is not yet in operation. Other mine buildings and a town are being planned. The mine will produce in the neighborhood of 2,500 tons daily.

New companies organized in West Virginia during August had an aggregate capitalization of \$260,000. They were the following: Crandall Mining Co., of Altman, capitalized at \$50,000; Duffy Brothers Coal Co., of McMechen, capitalized at \$10,000; Manufacturers Gas Coal Co., of Wellsburg, capitalized at \$50,000; Rogers Elkhorn Coal Co., of Virgie, Ky., capitalized at \$150,000.

The Crystal Block Coal & Coke Co. has increased its total authorized capital stock from \$500,000 to \$700,000. Other concerns increasing their capitalization include The Peerless Smokeless Smithing Co., from \$100,000 to \$500,000; New Howard Coal Co., from \$300,000 to \$400,000; Cardiff-Pocahontas Coal Co., from \$100,000 to \$150,000; The Peerless Smokeless Smithing Company has changed its name to the Peerless Fuel Co.

Roda No. 1 team of the Stonega Coal & Coke Co., tied with the Derby No. 2 team of the same company, won by a small margin in the play-off at the sixth annual first-aid meet of the Virginia Coal Operators Association on Sept. 20. The Roda team has been victorious for two years and has enabled the Stonega company to win the association cup three times in the last six years. Twenty-nine teams were entered. The American Red Cross, U. S. Bureau of Mines and the National Safety Council co-operated with the Virginia association in holding the meet.

## WYOMING

W. C. Alden, of the U. S. Geological Survey, has completed his summer's geological work in Wyoming.

Mine exhaustion and operating troubles in Union Pacific Coal Co. coal lands in the Cumberland region have caused the company to employ A. R. Schulz, a former government geologist, to prospect the Cumberland region in an effort to locate deposits which will enable the company to open new mines without abandoning that district.

According to a recent announcement, the Sheridan-Wyoming Coal Co. will operate its own property in the future. D. P. B. Marshall, attorney for the firm, announced the cancellation of the company's contract with the Peabody Coal Co. for operating and selling. Harry N. Taylor, of New York City, will continue as president of the Sheridan-Wyoming company. He has held the office for the last year, succeeding Peter Kooi, of Sheridan. The Sheridan-Wyoming company will now organize its own operating and sales departments, and will hold in the field a great majority of the local personnel formerly employed by the Peabody. Edward Botmley, who has been division super-

intendent in charge of operations in this field ever since the consolidation in 1920, has been invited to continue as general superintendent in charge of operations for the Sheridan-Wyoming company.

## CANADA

Dr. Charles Camsell, chairman of the Dominion Fuel Board, states that only from 25 to 50 per cent of the consumers of domestic fuel who last year bought their winter's requirements during the summer have done so this year, and fears that this condition will disturb prices and cause considerable inconvenience.

At a special meeting of the preferred shareholders of the Dominion Coal Co. in Montreal on Sept. 23, a mortgage of \$15,000,000 on the company's property was authorized. President Roy N. Wolvin announced that a reserve fund would be created to be drawn upon for the payment of dividends in years when current earnings might be insufficient for the purpose.

J. E. McLurg, vice-president of the British Empire Steel Corporation, states that it is the intention of the company to send three or four of the mine managers of the Dominion Coal Co. on an educational trip through the coal districts of the United States.

The Coal Dealers' Association of Regina, Alta., states that owing to the protracted miners' strike there is serious danger of a coal shortage in that city. They have stocks on hand sufficient to last for only five or six days of cold weather and no plans are being made to relieve the situation by bringing coal from the East.

The Scranton coal mine, situated northwest of Drumheller, Alberta, was re-opened on Sept. 15, the miners accepting last year's contract. The output of 100 tons daily will be rapidly increased. Two other large mines are preparing to sign up with their men. John A. Henderson, of Winnipeg, part owner of the Gem mine, in Northern Alberta, states that there is more coal coming to Winnipeg from Alberta than is required to meet the present demands of householders who have been holding back orders on account of fine weather. All the mines west and south of Edmonton are working with non-union labor.

## Industrial Notes

F. C. Ackerman, formerly fuel supervisor for the Baltimore & Ohio R.R. at Wheeling, W. Va., has severed his connections with that company and is now representing the Hulbert Oil & Grease Co., of Philadelphia, in the Wheeling district.

Martin G. Sperzel was elected a director and the vice-president of the **Royersford Foundry & Machine Co.**, Royersford, Pa., at the regular Board Meeting held Sept. 10. He succeeds H. R. Will, who has retired from the company. Mr. Sperzel also will assume new duties as the company's general manager. He will continue, however, to be in charge of all sales including machine tools, punch and shear machines, and tumbling barrels, which heretofore have been directed from the home office at Royersford, Pa. Mr. Sperzel will be, as at present, in the Philadelphia office of the company, at 52 North Fifth Street.



## Traffic

### Ohio Coal Company Withdraws Rate Protest

The Ohio Collieries Co., Toledo, Ohio, has dismissed its protest pending before the state Public Utilities Commission against the coal and freight rates of the Hocking Valley R.R. on shipments from the Hocking and Pomeroy district to Columbus.

The case had been set for a second hearing by the commission for Sept. 24. The protest contended that the rate, \$1.26 per ton, was unjust and discriminatory as compared to the rates on West Virginia coal. One hearing already had been held at which the coal company produced evidence to substantiate its claim that rates should be lowered.

Governor Donahey a few days ago directed the Attorney General's department to take action before the Utilities Commission in an effort to have this inequality in rates adjusted for the benefit of Ohio miners and operators.

### Dealers to Combat Higher Rates From Illinois and Indiana

'Coal dealers' organizations and other consuming interests are organizing throughout the Northwest to combat the proposed increase in rates on coal from Illinois and Indiana to Wisconsin, Minnesota and the Dakotas. These rates were ordered originally in the Lake Dock cases decision, but were suspended in so far as they applied to central and northern Illinois and to Indiana. They are now in effect on coal from southern Illinois, however. The suspension period ends Jan. 8 and hearings no doubt will be held before then.

### Idaho Coal Rates Reduced

Lower freight rates on coal from the Brown Bear mine of the Teton Coal Co. to all points on the Oregon Short Line in Idaho were filed Sept. 18 with the State Public Utilities Commission by the railroad company.

The new tariff, prepared in compliance with the commission's order of Aug. 23, is made retroactive; its effective date being that of the order.

Virtually, the new rates are those compiled by Samuel N. Newton, rate expert of the commission, as alternatives for rates proposed in a tariff filed by the railroad company on July 12, which was suspended and made the subject of a commission hearing held at Pocatello on Aug. 4.

The original tariff was held to be discriminatory because it contained rates higher per ton-mile than those in effect for coal hauled from Wyoming and Utah fields. As amended, the rates were lowered from 5c. to \$1.70 a ton in nearly all points in the state.

The tariff is the latest step in the experiment, marked by an extended contest before the Utilities Commission, by H. F. Samuels, Progressive nominee for Governor, and his associates, Robert H. Harlin and Carl A. Reichert, to bring the old coal prop-

erties of the Teton valley into successful operation again. After commission hearings which resulted in an order requiring the Oregon Short Line to repair its tracks from Talbott Junction to the Brown Bear mine, an agreement was reached between the parties, the tracks were repaired and shipments of coal began on July 7.

## Obituary

**James M. McVey**, president of the Cadel Ridge Coal Co., and a well-known operator of Fayette County, met instant death on the night of Sept. 19 when an automobile he was driving plunged down a steep embankment near East Bank, W. Va. Mr. McVey, who was 44 years old, had taken an active part in politics and was elected on the Republican ticket as a member of the Legislature from Fayette County, serving at the session of 1919. Succeeding him in that office was his brother-in-law, H. T. Lyttleton, who met death in the same way about two years ago near Glen Jean. At that time Mr. McVey was in the machine but escaped with a few bruises. The funeral was held at Charleston.

**I. B. Parsons**, 75, a pioneer of the Birmingham (Ala.) district, and for many years associated with various coal companies in exploiting coal lands in the vicinity of Birmingham, died Sept. 14 at a local infirmary after a brief illness. Mr. Parsons was born at Adger, Ala., and went to Birmingham when he was about 10 years old. Beside his coal-land work, he served a number of years as a deputy for the county. He leaves two sons and five daughters.

**Frederick Rice Buell**, formerly Lehigh Valley coal agent in Milwaukee, died Sept. 12 in the suburbs of Cleveland. He was born in Geneseo, N. Y., 70 years ago and was for some years, as a young man, connected with the wholesale anthracite business of Andrew Langdon in Buffalo. He had a diversified career, going to the Klondike in the gold rush there and once owning a ranch in Idaho. He was educated in Buffalo and the University of Michigan. His father, Frederick Buell, was Collector of the Port of Buffalo and his mother was a daughter of the Rev. Charles Backus Storrs, founder and first president of Western Reserve University, Cleveland. He left no descendants.

## Coming Meetings

**Alabama Mining Institute.** Annual meeting, Oct. 7, Hotel Hillman, Birmingham, Ala. Secretary, James L. Davidson, American Trust & Savings Bank Bldg., Birmingham, Ala.

**Illinois Coal Operators' Association.** Annual meeting, Oct. 7, Chicago, Ill. Secretary, C. E. McLaughlin, Fisher Bldg., Chicago, Ill.

**National Coal Association.** Board of Directors' meeting, 9:30 a.m. Oct. 10, Washington Hotel, Washington, D. C. Open to association members and those interested. Executive Secretary, H. L. Gandy, Washington, D. C.

**American Institute of Mining and Metallurgical Engineers.** Fall meeting, Birmingham, Ala., Oct. 13-15. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

**American Institute of Electrical Engineers.** Fall convention, Pasadena, Calif., Oct. 13-17. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

**American Gas Association.** Sixth annual convention and exhibition, Steel Pier, Atlantic City, N. J., Oct. 13-17. Secretary, Alexander Forward, 342 Madison Ave., New York City.

**Canadian Institute of Mining and Metallurgy.** Sixth annual Western Meeting, Oct. 16-18, Blairmore, Alta. Can. Secretary, Moses Johnson, Blairmore, Alta., Can.

**Illinois Mining Institute.** Annual meeting, Nov. 22, Elks Building, Springfield, Ill. Secretary, Martin Bolt, Springfield, Ill.

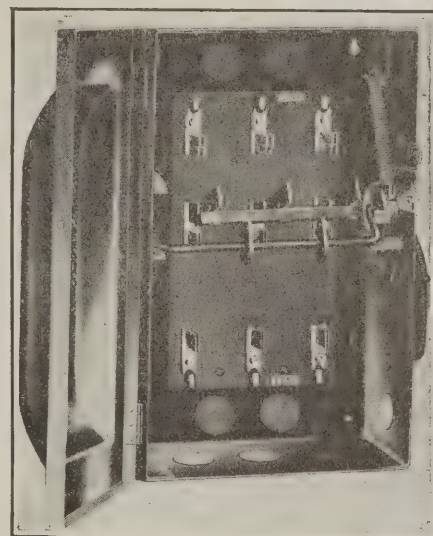
**West Virginia Coal Mining Institute.** Annual meeting, Dec. 2-3, Welch, W. Va. Secretary, R. E. Sherwood, Charleston, W. Va.

**Coal Mining Institute of America.** Annual meeting, Dec. 3-5, Chamber of Commerce Bldg., Pittsburgh, Pa. Secretary, H. D. Mason, Jr., 909 Chamber of Commerce Bldg., Pittsburgh, Pa.

## New Equipment

### Safe Motor-Starting Switch

A safety switch suitable for use with small motors and under conditions where it is desirable to interrupt currents quickly has been placed on the market by the Trumbull Electric Manufacturing Co., Plainville, Conn. The fuse block is mounted over the switch base so that the fuses are readily accessible. Line leads can be brought in either at the top or bottom of the switch. The switch is provided with a



### Quick Make-and-Break Switch

Switches like these are suitable for starting small motors. The quick rupture of the circuit is accomplished by a spring attached to the operating handle.

quick make-and-break device and an interlock.

The construction is of the "dead-front" type, a shield being used to cover the line terminals. The switches are furnished fused or unfused two-pole or three-pole for 250-volt service, but 440-volt and 550-volt two-pole and three-pole switches will soon be placed on the market.

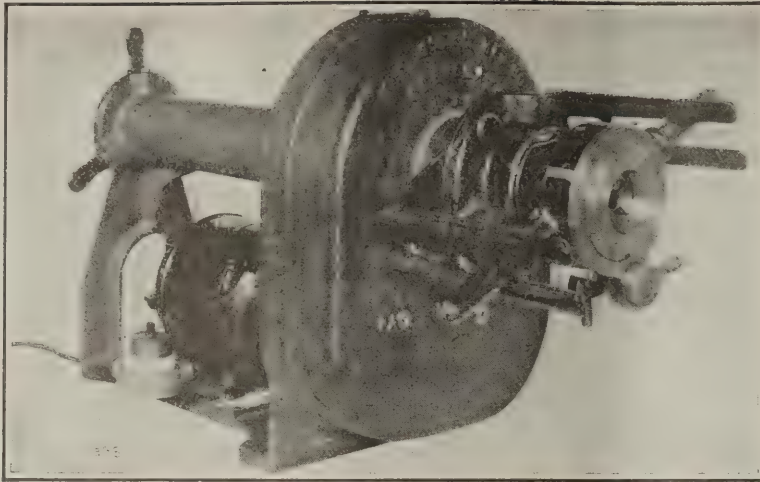
### Power Drive for Die Stocks

Undoubtedly every man who has had the experience of pulling on a die stock knows of other jobs he would rather do. It's a back-breaking proposition. The large power pipe-threading machines used today are back savers and are great things for shop use; but what of a small, compact, power outfit capable of threading all sizes of pipe used generally in every-day work and as easily conveyed from job to job as a hand tool!

To meet the requirements of a tool of this character the Oster Manufacturing Co., Cleveland, Ohio, has brought out the machine illustrated herewith. A clear conception of the simplicity and compactness of this little unit may be gained from a study of the illustration presented.

It has both the qualifications desired





### A Handy Machine for Use Where Much Piping Is Done

Pipe may be threaded, cut and fitted with this little power unit. It is portable and operates from the ordinary electric-light circuit.

—portability and the capacity for handling all sizes of pipes used mostly by anyone having pipe threading to do. It weighs but little over 200 lb. and may be conveniently handled by two men. The machine being designed to drive the No. 104½ Oster bulldog die stock gives it a range covering all sizes of pipe from ¼ to 2 in. inclusive. Its length over all is 2 ft. 11 in., width, 1 ft. 2 in.; height, 1 ft. 8 in.

A ½-hp. motor geared to the driving arms furnishes ample power to thread all sizes within the range of the machine. The driving arms maintain a no-load speed of 9 r.p.m. and approximately 8 r.p.m. under a load. The machine is not a rapid production outfit but it will keep two or three good men hustling to fit up the pipe it will thread. Running the machine from an ordinary electric-light socket eliminates the necessity of installing extra wiring. A built-in scroll chuck and auxiliary centering guide are two desirable features, no extra vise being required. Both the chuck and the guide are self-centering and self-locking.

Due to the fact that the gears are completely enclosed and running in oil, the machine operates with very little noise and wear.

The machine as a whole is claimed to be very durable, built to stand the everyday hard use over the ordinary business lifetime. The driving arms which are necessarily strong are of malleable iron. The chuck jaws and guides being subjected to much wear, are drop-forged steel, case hardened. The machine was originally intended to be used for driving the bull dog die stock. However, it was equally efficient in driving a hand cutter.

The cutter is placed on the pipe in much the same fashion as it is when about to be cut off by hand. The handle rests against one of the driving arms and the machine revolves it. All the operator does is to tighten it on every revolution. The machine later proved its ability to turn up fittings as well. The elbow coupling or tee is started by hand, one or two turns are given, a wrench is placed on it, and the driving arms do the rest. When the fitting is tight the operator simply snaps the switch.

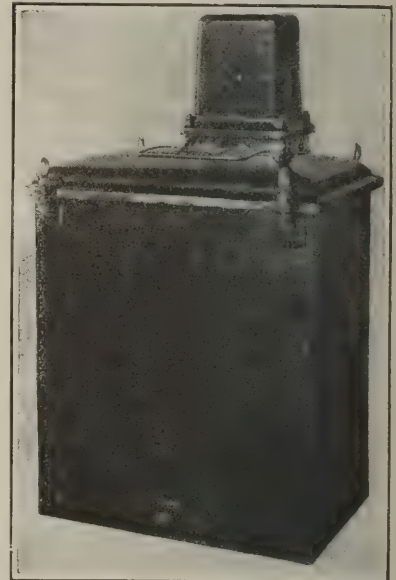
### Starter for High Voltage Induction Motors

An automatic high-voltage compensator has just been placed on the market by the Electric Controller & Manufacturing Co., Cleveland. This compensator is built for voltages as high as 2,500 and below. It is pushbutton operated and entirely automatic. With the exception of the overload panel, which is mounted on the top of the tank, the compensator is entirely submerged in oil and the tank is so designed that it is dustproof, weatherproof, vaporproof and fireproof. The compensator can be installed either indoors or outdoors.

A pushbutton supplied by energy from a low-voltage circuit which is taken from an independent transformer is so arranged that there is no danger

of the operator ever coming into contact with the high-voltage circuit. Because the starting transformers and the operating mechanism are entirely submerged in oil and automatically operated, all possibility of explosions or high-voltage flashes is removed.

This automatic compensator is so designed that continuous torque is ap-



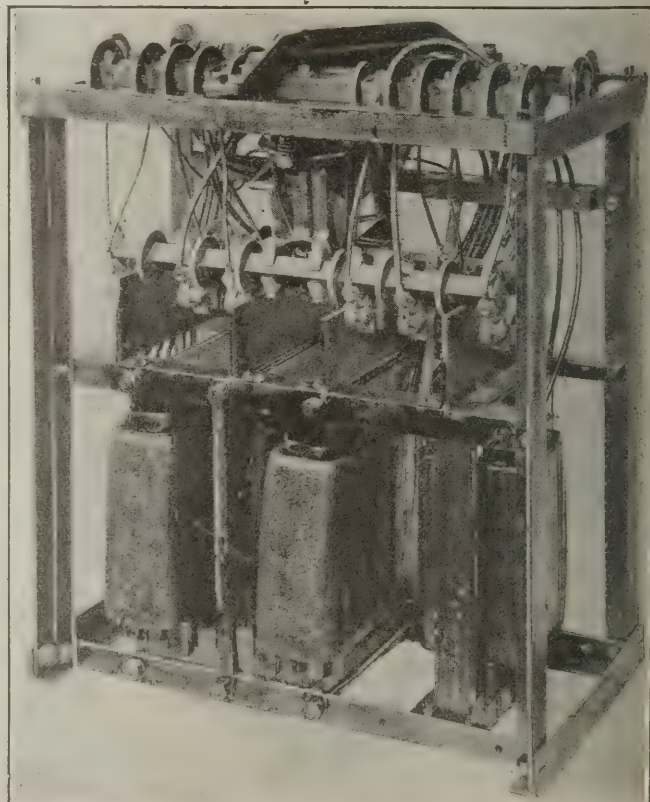
### No Moisture or Dust Can Get In This Automatic Compensator

Built like a transformer and sealed against moisture and dust, this unit is made safe for service anywhere.

plied to the motor from the time the pushbutton is pressed until the motor has been brought up to full speed. Operation of the starting switch causes the motor to be started under reduced voltage.

### Contactors and Starting Transformers Submerged in Oil

All the current-carrying and transforming elements of this starter are operated in oil. A separate transformer supplies current to a pushbutton switch used for starting and stopping the motor. After the motor has reached the proper and safe speed it is automatically thrown across the line.





# COAL AGE

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## Half Truths Are Misrepresentations

SECRETARY DAVIS at the National Safety Council meeting in Louisville called for facts about accidents and suggested that the Department of Labor was going to ascertain them, if Congress would support that development of the department's activities.

We have consistently contended that the facts about coal mining were misleading because they were not compared with facts regarding other industries. Now it appears that other industries are to come out into the light so that a comparison will be possible. It will no longer be so easy to condemn the coal industry simply because it has a record and the others no record at all. The coal industry feels glad that investigators are sharpening their pencils to keep track of other industries, confident that when the records are disclosed it will be realized that "when a man's a miner" he is not unduly prone to death.

There are other ways in which coal is being measured, and the measurement is unfair because it is not comparative. Perhaps after a while such measurements will be applied generally and it will then be found, we believe, that coal mining, though by no means clean of fault, does not compare unfavorably with other activities. Should the comparison, however, prove unfavorable the industry will be spurred even more than in the past to a house cleaning.

## Screenings! Screenings!

THE ANNUAL futile struggle to sweep back the resistless tide of low price screenings is on. In some of the Midwest mining fields where the market price of screenings dropped enough to absorb all the seasonal increases on domestic sizes, operators are determinedly piling fine coal on the ground. And believe them, they are going to hold those screenings there if necessary until it's 32 above zero in Hades before they give that coal away to the patiently waiting big steam buyers. And so on and so forth. It is pitiful to hear them talk.

The truth of the matter is that storage at mines may raise the price of those screenings a shade—even enough, here and there, to cover storage losses and the cost of putting the coal down and picking it up again—but storage is no permanent cure for the screenings problem. The real cure lies in coking that fine coal. Some day the right process of low-temperature distillation will be evolved, economical types of ovens will be built. Then fine coal—if not even the whole mine output—will yield at least a part of its byproduct content and eventually be sold as good coke.

That day may not be far distant. Out of the extensive trail-blazing now going on somebody is going to chart the right course. One Illinois coal mining company is spending a quarter of a million dollars on

experimentation in low-temperature distillation. With rare vision, and an even rarer willingness to spend money, these people realize that the mine operator stands to benefit first from the development of such a process and, therefore, should be first to know the art.

It is fitting that Illinois get seriously down to business because its proportion of screenings has increased from 19 to 48 per cent of the state's total output from 1900 to 1923, and the present annual loss to the state is from \$10,000,000 to \$12,000,000, if we accept the estimate of that skilled statistician Dr. F. C. Honnold. Considerable reduction in the proportion of screenings can be effected by improved blasting—possibly by the complete abolition of explosives—but low-temperature coking is the true solution of the screenings problem.

## Working in the Dark

ELECTRICAL equipment plays such an important part in the successful operation of a mine nowadays that we wonder why so many mining officials are tardy in recognizing this fact.

Coal companies are of several kinds in this respect. There is the company that has an electrical engineering department which functions as such. Another company occasionally employs a consulting electrical engineer. A third type hires a chief electrician and lets it go at that, while a fourth is the company that just drifts along.

The ideal electrical organization is no doubt the one that plans and supervises the installation, use, and repair of all electrical apparatus belonging to the company. Such an organization is always on the job and continually sensitive of the changes and progress to be made by the company. Many appreciable savings can be effected by such a unit because nothing can occur within its scope of supervision without receiving proper attention.

Any company employing a consulting electrical engineer should not only use his services for particular jobs but have him continually in touch with all electrical details of the company. Only by a complete understanding of the various problems of a mine can a consulting engineer do his best. If an engineer is only temporarily employed the equipment he installs may never function as successfully or economically as was intended. He should remain on the job and direct its operation.

Too many companies are prone to fool themselves regarding their electrical organization. Self deception may be great sport for some people, but at home is a poor place to begin to fool. An electrical engineer traveling through some sections of the mining field would hate to be called an electrical engineer after he had seen some of the men who have been handed this title by their employers.



Those companies not having someone to look after their electrical apparatus are either small or some peculiar conditions are keeping them from bankruptcy. An adequate conception of the importance of electrically operated machinery by the managing officials will quickly make them realize that the day has passed when they can operate without knowing what is happening to their electrical energy or what is causing delays and high maintenance costs.

### Possibilities of Stainless Steel

ONE OF THE useful metal alloys to make its appearance within recent years is that known as "stainless steel." At first to most people this metal appeared to possess possibilities only in the direction of domestic utensils, cutlery and the like. Its production and use, however, has now progressed to the point where it would seem to be adapted to a far wider field of industrial usefulness.

Steel of this kind is stainless because it resists both acid and corrosion. This characteristic renders the material suited for many uses to which ordinary steel is but poorly adapted. Of course, only the test of time and use can establish the adaptability of any metal to engineering purposes and the utility of any product is determined by balancing its cost against the service rendered.

At the present time, however, it would appear that stainless steel might find a place in the coal industry as shaker jackets, chute linings, jig linings, pump linings, as pipe for conveying acidulous water and in short wherever a forged or rolled acid-resisting metal is now desirable. It might be interesting to ascertain also how a steam power boiler built of this alloy or its close relative, rustless iron or chrome iron, would endure when fed with acidulous mine water. If its performance and life were satisfactory the water problem of many a mine now experiencing difficulties of this kind might be permanently solved.

### The Humbug Harvest

AUTUMN is pre-eminently the season of harvest. But the harvests of grain and fruit are not the only ones that come to maturity in the Fall. Almost every autumn brings forth its crop of "fuel savers." No sooner do leaves begin to accumulate on the lawn than the good man of the house begins to receive "literature" setting forth in glowing terms the advantages, pecuniary and laborwise, of installing this or that device on the furnace door, the check damper, the smoke pipe leading to the chimney, or of treating the fuel or the ashes with some marvelous chemical that simultaneously aids combustion and conserves the purse, the back and the commandments.

Now it is not the intention here to utterly condemn all of these devices, *en masse*, as unmitigated fakes and humbugs. Some of them if properly installed and handled may give some degree of economy. As a rule, however, an equal economy could be secured by proper manipulation of the furnace itself.

Taking them by and large the "fuel savers" that make their appearance with the first frost and fade away about the first of March, are of three general types: Chemicals, devices placed between the furnace

and the chimney or within the chimney and devices that admit air above the fuel bed.

Most chemicals sold in powder or crystal form, to be dissolved in water and sprinkled on the fuel to promote its combustion or "make it go farther," or to render possible the burning of ashes, have little or no real value. Common salt added to coal or coke in the proper amount will change the color of the flame imparting a characteristic yellow tint. Copper or its salts gives an equally characteristic blue tinge. Such chemicals may deceive the observer but hardly aid combustion. Sodium or potassium nitrates and in general, chemicals that liberate oxygen on the application of heat may aid combustion but are expensive and consequently are sedulously avoided by the concoctors of "fuel savers."

Devices placed between the furnace and the chimney or within the chimney itself usually operate on the idea that lowering the chimney temperature prevents heat loss or rather lessens the quantity of heat that "goes up the flue." While it is quite true that admitting cold air into the smoke pipe or chimney lowers the temperature of the chimney gases, it is not true that this process accomplishes any desirable result. In fact it may seriously reduce the draft and decrease the rapidity of combustion on the furnace grate.

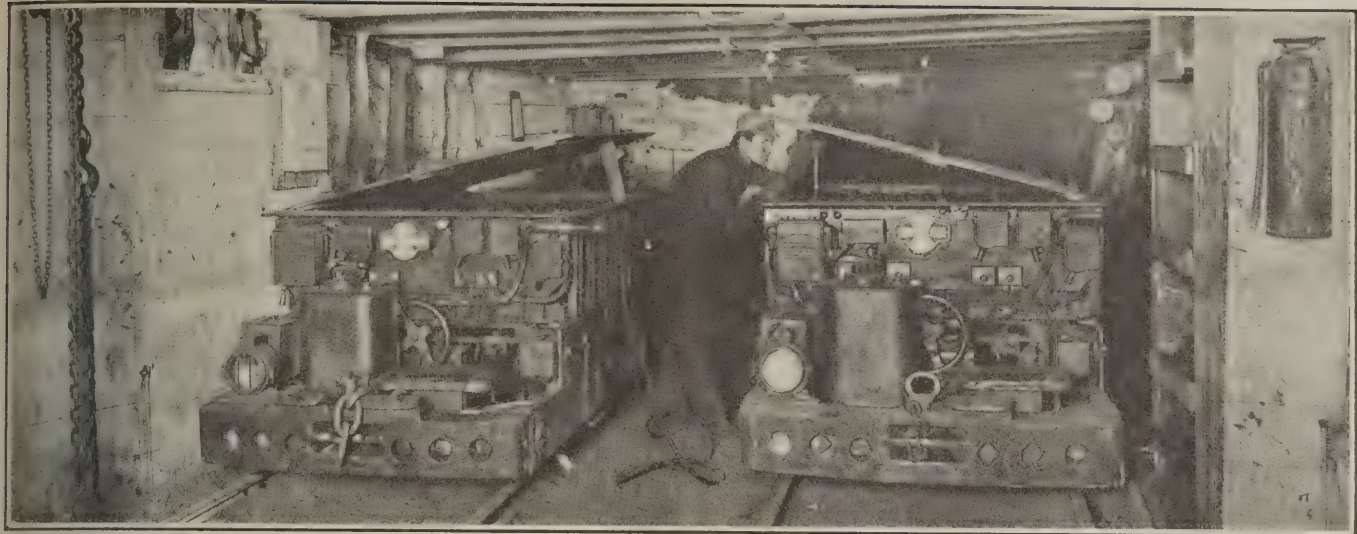
Devices that admit air immediately above the fire come on the border line of usefulness. It is a fact that certain fuels require the admission of air above the fire during the coking process if perfect combustion is to be secured. In order to be effective, however, this air should be thoroughly mixed with the gases arising from the fuel bed before these gases come in contact with the comparatively cold metal surfaces of the furnace. Practically all furnaces are fitted with a draft in the fuel door for this express purpose. This draft is masked by a perforated baffle plate intended not only to prevent the fuel door from warping but also to heat the air admitted above the fire and to introduce it into the combustion chamber in a series of small jets or streams so that it will mix thoroughly with any combustible gases that may be present.

Ordinarily the householder forgets all about this little draft in his furnace door and the function it is supposed to perform. The device in question in effect substitutes some other form of air and gas mixing device and keeps the draft permanently open. It may or may not perform a desirable function depending upon the volatile content of the coal burned, the desired rapidity of combustion and other factors.

Nothing that has been here said is intended as casting any reflection upon various electrical stokers intended to render available to the householder the finer grades or steam sizes of anthracite. Nor is aspersion cast upon many other devices such as thermostatic furnace controls or various chimney caps or cowls that increase the draft. Many of these are designed on scientific principles and really accomplish economic results. But it has been rather the endeavor herein to point out that there are various and sundry fly-by-night, catch-penny schemes to which no honest coal producer or dealer can afford to lend his sanction.

IN RUSSIA loose-tongued enemies of the government in the streets are silenced forever in the coal mines by the dreaded Tcheka. In America we can't even check a few that are already in the mines.





Testing Battery Cells

## How to Save Power and Thus Reduce Maintenance And Operating Costs of Mine Machinery

By Reducing Power Used Motors Are Saved from Overloading—Watch Operation Through Power Consumption—Machine Bits of Irregular or of Excessive Length Waste Power—Frequent Sharpening Less Desirable Than Correct Shaping and Tempering

By W. H. RUSSELL  
Farmington, Ill.

**T**HOUGH the cost of electric power used in mining coal heretofore has not been a large item, in comparison with that for labor, changes in the system of mining seem likely to increase the power used. This will eventually mean that it will be necessary to have facilities for separating the power cost for each class of service just as the cost of labor is now separated. This is the only practical means of detecting and locating leaks so that they may be stopped. Such a system may be quite expensive in some cases and in others cheap. Where power for cutting and haulage operations is supplied from separate feeders, it is a simple matter to meter their requirements.

With direct-current systems supplied by alternating-current converting apparatus, it must be remembered that the total direct-current power supplied by a converter or motor-generator set will not equal the alternating-current power supplied to the converting equipment, yet it is for the alternating-current power that payment must be made. The losses, however, can be charged in proper proportion to the power used as recorded by the direct-current meters.

This method has often disclosed a serious loss caused by running a large motor-generator set to supply direct-current power for a small pump during the night shift. Sometimes it requires more power to operate the motor-generator set than it does to run the pump. Such a loss may amount to a considerable sum of money in the course of a year, besides the wear on the motor-generator set.

NOTE—By keeping tabs on the current consumed by apparatus, as shown in the headpiece, correct conclusions can be made as to the condition of the equipment. Load charts will tell when a motor is overloaded and quickly show whether it is earning or saving the money expected.

One of the principal reasons for keeping separate records of the cost of power for different purposes is that many things can happen to mining machines, locomotives and other machinery which will cause them to be wasteful of power even when they appear to be working satisfactorily and efficiently.

Wasted power may seem to be an insignificant subject to some who have never investigated it, but it is a fact that some of the simplest things may be causing leaks which amount directly or indirectly to thousands of dollars annually. For instance, it was decided a few years ago that the cutter chains on our mining machines were not properly arranged and were the cause of undue wear on all parts of the machines. After some experimenting we decided that a certain arrangement would give the best results and all of the chains were rearranged accordingly and that without the use of any new parts except rivets.

The immediate results were an increase of from 15 to 20 per cent in the work accomplished by the machines and a noticeable reduction in the heating of the motor and cable. From this example it can be seen that a reduction in the power required by the machines will make savings by decreasing the wear and strain on every part of the machine, but the saving of power is in itself well worth while.

After using this new arrangement of the chain for a month, we found that the power consumption for coal cutting had dropped from 1.33 kw.-hr. per ton to 1.09 kw.-hr. per ton. After several years use of the same chain arrangement it has been found that the power consumption for all of the machines, both shortwall and breast types, varies from 1.04 to 1.2 kw.-hr. per ton whereas for all of the time previous



to the adoption of this chain arrangement, beginning when the machines were new, the power consumption varied from 1.1 to 1.52 kw.-hr. per ton, the average saving being about 0.6c. per ton. The power consumption for two typical years before and after this change expressed in cents per ton is shown in Fig. 1. These results were all obtained from machines operated in a 4-ft. seam and include the power-conversion losses from alternating to direct current and transmission to the machines.

#### KEEP CLOSE WATCH OF POWER CONSUMPTION

It is not a difficult matter to measure the power used for various purposes, but it probably is impossible to estimate accurately the indirect savings that can be effected by keeping watch of the power consumption and maintaining it as low as possible. Unfortunately the usual system of mining coal does not permit close supervision of either machinery or men, but a good check on the performance of machinery can be kept by a constant comparison of the cost of power with production.

Not all the defects which are revealed by a close watch of power consumption are mechanical or electrical—the human element is a big factor. Machine runners

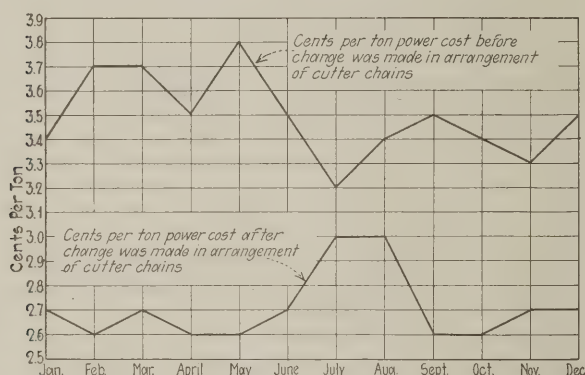


Fig. 1—Results Obtained by Rearranging Cutter Chains

Improper adjustments of chains on coal-cutting machines quickly increase the amount of power required. Delays and the careless repair of cutter bits also increase operating costs.

as a rule do not realize that if they do not set their bits properly they may increase the load on their machine as much as 25 or even over 50 per cent. If you have ever used a dull saw with teeth improperly set and then used it again after it had been sharpened and accurately set, you can realize what can be done to a mining machine by setting the bits at all lengths so that the long ones are immediately dulled. The first indication of poor results is in the power consumption and the last, perhaps, in the junk heap.

It must be remembered also that the bits may be set perfectly even and still cause unnecessary load by setting them a little too long; if they are set so as to cut a 6-in. kerf when a 5-in. kerf is enough, the power used in actually cutting the coal is increased and the quantity of cuttings is increased 20 per cent.

#### PROPERLY SHARPENED BITS EFFECT SAVINGS

The sharpening of bits is an important matter but only too often is it neglected. It seems as though the sole object of some bit-sharpening departments is to turn out as large a number of bits as possible. A little intelligent inspection will often disclose the fact that half the same number of bits, if properly sharp-

ened and tempered, would do more work with less power and effect many savings.

Here again the human element should be considered; the average machine runner is more likely to change the bits in his machine when necessary, if he has a good supply which he knows will fit the chain without much hammering. If he can do a fair quantity of work after he gets them and does not have to hunt all over for a box of bits which he knows he will have trouble in setting into his chain, he will take better care of his machine. If he breaks the points off half of them driving them in and afterwards sees some of the others break off the instant they strike the coal, he soon cares little about his work. If the latter condition prevails he will be sorely tempted to put off changing bits as long as possible.

The sharpening and tempering of bits is a matter which deserves no little attention and, if the cutting is extremely hard, the proper attention to sharpening, tempering, delivering, and setting of bits will pay big returns. Once the proper system is well established and understood, the satisfaction resulting to everybody concerned is usually enough to keep it going with but little attention.

It has been found that the practice of checking up the power consumption of apparatus has been the means of discovering numerous wastes of power, some of which are important because of power losses and others because of damage to equipment by bad operating practices, such as starting locomotives in parallel, operating motors on resistance points, or running on grades with the motors in parallel when better results could be obtained with the motors in series. Mining machines are often geared too high, and this makes it necessary to run on resistance points with much waste of power and damage to the rheostat. In the opinion of some engineers this is a rather common fault of gathering locomotives. It is quite possible that there are some cases where heavy grades predominate and a slow-speed locomotive would be better for main haulage service.

#### VOLTAGE DROP WASTES POWER AND CAUSES DAMAGE

Voltage drop is a common form of wasted power. It results in serious damage to every electrical part of the system, not to mention the slowing up of production. Excessive voltage drop is usually the result of ignorance. It is my opinion that the voltage drop should not be allowed to exceed 10 per cent, but many will argue that the interest and other expense of sufficient copper to keep it at that value or less is more than the saving that can be effected. This would be rather a hard thing to prove, but it is certain that money invested in copper is much more easily converted into dollars and cents than wasted heat energy and roasted field coils and armatures.

The damage, unnecessary expense, and a long train of other evils, which are the result of allowing power wastes to continue, cost more than the power which is wasted. Power consumption is such a good indicator of production that it seems as though every possible advantage should be taken to know how much coal every kilowatt-hour produces and what part of every kilowatt-hour purchased or generated is wasted in roasting some perfectly good motor because it is dragging around a worn-out cutter chain or because somebody installed an expensive compressed-terminal rail bond with a hammer instead of with a bond compressor.



# Alabama Coal Washing and Cleaning Practice Helps Make Good Metallurgical Coke\*

Beds Carry so Much Extraneous Matter That Cleaning Is Necessary—Dirt Mostly Confined to Medium Sized Mine Product—Small Coal May Be Shunted Past Jigs—Sludge Must Be Recovered

BY H. S. GEISMER  
Birmingham, Ala.

**B**ACK in 1896 H. H. Campbell stated that: "The Birmingham district in Alabama has certain great advantages for there are few places in the world where fuel and ore are so near together, although, unfortunately, both are of inferior quality; the ore being low in iron and high in phosphorus and the coal giving a weak and impure coke."

This statement could not have been questioned in 1894, but by 1896 several Robinson-Ramsay washers had been put into operation and weak and impure coke was a thing of the past.

The Warrior coal field of Alabama contains six beds that yield coking coal of excellent quality. In descending order, these are: The Brookwood, Milldale, Pfatt, America, Mary Lee, and Black Creek. In each of these, however, occur bands of rock and bone; and while some of the impurity present can be separated and gobbled by the miner, much of it must be loaded out with the coal. Consequently, unless the coal is washed it will yield a coke of varying ash and sulphur content quite unsatisfactory for blast furnace use. At present, the Gulf States Steel Co. is producing run-of-mine coal at its Virginia mine, from the America seam, that is sufficiently uniform and low in ash to permit of coking without washing, but this is the only exception to the above statement.

At the present time two new systems of coal cleaning are attracting attention throughout the United States—the air or dry-cleaning process and the Chance sand-liquid method. Neither of these has been tested in Alabama but with these two exceptions all the methods used for cleaning bituminous coal have been largely brought to perfection in this state.

## TWO-COMPARTMENT JIGS USED ON COKING COAL

In recent years, practically all of the plants designed to produce coking coal have used two- and three-compartment jigs, while the companies making washed coal for commercial purposes favor single-compartment machines. Experience with Alabama coals has demonstrated that there is little difference in the quality of the washed coal produced on the different jigs if they are intelligently operated; there is, however, a wide variation in the amount of water required and the percentage of coal lost in the refuse.

When the first washers were built in Alabama, coal costs were low and the land surrounding the mines was owned principally by the operating companies. Fine coal was considered a necessary part of the sludge, and was allowed to find its way to the nearest stream.

Increasing coal costs made it advisable to recover the fines and damage suits, instituted by the farmers upon whose land the sludge was deposited, made it necessary to retain the sludge at the plant.

## THREE METHODS OF RECOVERING FINES

At present, three methods are used for recovering the fine coal from the sludge and for clarifying the sludge-carrying water. These include: (1) Long settling or clearing tanks with slowly moving conveyors that drag the fines that settle along the bottom to the discharge end. This is the most common method, but where large capacities are treated it often requires all-night operation of the conveyor to recover the fines that have accumulated during an 8-hr. shift. It also has certain other drawbacks.

2. All the overflow water from the washed-coal settling tank (this water contains all the sludge) may be pumped to an elevated conical tank. The water is recovered from the top of the tank and flows back to the sump. The fine material is drawn off at regular intervals from the bottom of the tank and carried, by a conveyor, to the top of the washed-coal bin. The conical tank is far superior to the long horizontal tank, and there is nothing connected with it to get out of order.

3. To date, two installations of Dorr thickeners are to be found in Alabama; one is at the Palos plant of the Republic Iron & Steel Co., where coking coal is produced, and the other at the No. 2 Overton plant of the Alabama Fuel & Iron Co., which produces steam coal. The fines recovered by the Dorr thickener at Overton have no commercial value, as they run high in rash and fireclay, but as the washing plant is located near a large river it was considered advisable to prevent the sludge being carried into this stream.

At all the Alabama operations where coking coal is produced, the sludge consists of water, pure fine coal, and fine impurities. The percentage of impurities, however, is not large and it is neither necessary nor profitable to separate it from the fine coal. At some of the operations in the non-coking fields, the sludge contains a large percentage of rash and fireclay. In such cases the material passing 20-mesh is worthless and no attempt is made to recover it.

## STANDARD SIZED SCREENS HAVE BEEN ADOPTED

Alabama plants producing steam or commercial fuel almost invariably screen all the coal as it comes from the mine and wash only that portion that passes through the screen perforations. Generally these are 2-in., but occasionally 3-in. perforations are found. Such plants do not require crushers. To meet the growing demand for stoker coal, some of the commercial mines may

\*Abstract of paper entitled "Coal Washing Practice in Alabama," to be presented before a meeting of the American Institute of Mining and Metallurgical Engineers, Birmingham, Ala., Oct. 13 to 15, 1924.



decide in the near future to crush their entire output and sell it in this condition.

Plants producing coking coal almost invariably crush and wash their entire output. At two large modern plants, however, the coal as it comes from the crushers is screened and the fines bypassed, only the coarser product being washed.

Two-roll crushers generally have been used for crushing. Several hammer crushers were installed in the early days but they produced too large a percentage of fines and complicated the sludge problem. Of late years, Bradford breakers have been installed at most of the large operations replacing crushers. At one plant in particular, one of these machines has entirely replaced crushers and has increased appreciably the capacity of the washer, as the breaker serves as a preparatory cleaner and relieves the jigs of some of their work.

At the mines where the entire output is washed, the coal is generally crushed to pass through a  $\frac{3}{4}$ -in. circular opening; this size gives excellent results on plunger jigs of the Elmore or Faust type. With the Stewart and Montgomery jigs, the size of the coal treated has little bearing on the quality of the washed coal produced; in fact, a feed of mixed sizes, from 2 $\frac{1}{2}$ -in. down, gives excellent results. Sizing before jigging as an aid to washing is not attempted at any plant in Alabama; sizing the coal to permit of bypassing the fines has quite a different object.

Because of the large percentage of slate and bone found in most Alabama coals, officials in charge of properties producing washed coal for coking purposes early realized the necessity of placing chemists at the coal washers to keep accurate record on the results obtained. It was soon found that these men were not only able to improve the quality of the washed product and to keep it uniform but also to reduce the cost. Their tests showed whether an excessive amount of coal was being lost in the refuse (this always indicated something wrong with one or more of the jigs). Such a condition being quickly noticed, could be remedied before any large loss resulted. Operating a modern coal washer without a chemist is like running a modern power plant without recording gages.

#### WASHERY BUILDINGS ARE OF PERMANENT NATURE

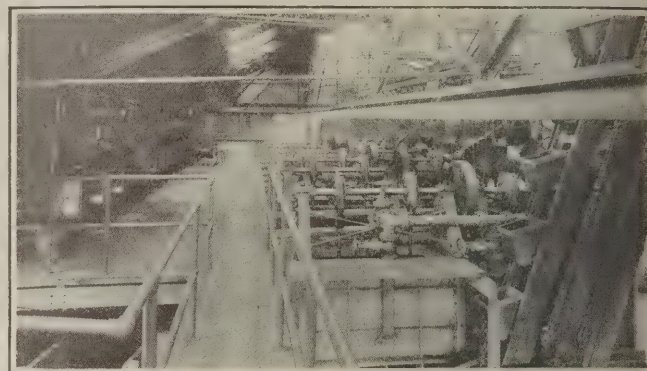
All buildings around coal mines formerly were constructed of wood and the first coal washers were made of the same material. Gradually steel and concrete replaced wood for all mine buildings including coal washers. There is much difference of opinion as to whether concrete, cast iron, or structural steel is best suited for jig tanks and all three have their advocates. Steel plates are not satisfactory if the water being circulated in the jigs is corrosive; if it is not corrosive fairly heavy plates have been found satisfactory. In the modern plants fireproof construction is used throughout.

The four large iron-producing companies of the Birmingham district have done much experimenting with coal washers and data covering one washing plant of each company has been furnished.

The Woodward Iron Co. coal washer at the Woodward byproduct plant handles Pratt seam coal from the company's mines at Dolomite and Mulga. All the raw coal goes through Bradford breakers and the material rejected by them is carried to the refuse bin. The material passing the breaker perforations is delivered to a

battery of Hummer screens. The material passing through the screens ( $\frac{1}{8}$  x  $\frac{1}{2}$ -in. slots) bypasses the jigs and is taken directly to the washed-coal conveyor. Approximately 30 per cent of the total run-of-mine coal is bypassed in this manner.

The jig plant consists of four three-cell Faust jigs. Although the primary jigs are of the three-compartment



Jig Floor, Risco Coal Washery

This plant, which is the property of the Republic Iron & Steel Co., treats coking coal. Much of the development work that has made modern coal washing equipment effective has been done in the Birmingham field of Alabama.

ment type, a secondary product is not produced, the refuse from the third cells and the third hutch is handled in a battery of rewash jigs and the resulting washed product goes to the primary washed-coal bin. Two cone settling tanks have been installed here. As this plant is located within a few hundred feet of the byproduct ovens, the coal is dewatered in three Elmore dryers.

Figures showing the results from this plant have been furnished by the Operating Department of the Woodward Iron Co. and are set forth in Table I.

Table I—Results Obtained at the Woodward Byproduct Plant

	Volatile Matter, Per Cent.	Fixed Carbon, Per Cent.	Ash, Per Cent.
Raw coal (coal sent to Bradford breakers).....	26.77	63.52	9.91
Bypass coal (coal from breakers passing through $\frac{3}{4}$ x $\frac{1}{2}$ in. slot, going to coal bin without washing).....	28.03	66.43	5.54
Coal to jigs (coal from breaker passing over $\frac{3}{4}$ x $\frac{1}{2}$ in. screen).....	25.96	62.15	11.89
Coal from jigs (average from 4 Faust jigs for year ending May 1, 1924).....			5.52
Coal from rewash jigs (average for year ending May 1, 1924).....			9.46
Washed coal (a mixture from all jigs and bypass coal).....	27.95	66.05	6.00

Refuse for the year, ending May 1, 1924, contained 3.21 per cent float; the ash in the float amounted to 6.58 per cent. The specific gravity of coal is taken as 1.37. The result of a screen test on coal from elevators (coal from all jigs) follows:

On 0.747-in. opening— 5.9 per cent.  
 On 0.525-in. opening— 8.3 per cent.  
 On 0.263-in. opening—24.5 per cent.  
 On 0.093-in. opening—71.9 per cent.  
 Through 0.093-in. opening—28.1 per cent.

The amount of water kept in circulation, per ton of coal washed, is approximately 950 gal.; the quantity of makeup water added, per ton of coal washed, is approximately 41 gal.

#### TWO-COMPARTMENT CAST IRON JIGS EMPLOYED

The Risco plant of the Republic Iron & Steel Co., handles Mary Lee seam coal from the Risco mine. The plant consists of three two-compartment jigs of a modi-



fied Elmore type, having revolving valves but specially designed plungers. These jigs are built of cast iron and steel castings throughout and each has a normal raw coal capacity of 70 tons per hour.

This plant has more elaborate equipment for the preparation of the coal before it reaches the jigs than any plant in the district. Two rotary dumps are employed. One is used only when it is desired to inspect the contents of a mine car, to see if the miners are loading dirty coal. Ordinarily the entire output goes through the other dump. From here the coal is fed to a Marcus screen by a reciprocating feeder. The fines from this screen, passing through 1-in. perforations, are carried directly to the main belt conveyor; the balance of the product goes through a large single-roll crusher, then through a double-roll crusher and onto a shaking screen having 1-in. perforations. All coal passing the 1-in. perforations is conveyed by a belt to a set of short-stroke quick-acting screens having 3/8-in. perforations. Material passing through this screen can be made to bypass the jigs but the balance of the material is delivered to them.

OUTPUT CAN BE LOADED WITHOUT WASHING

Provision has been made for loading the entire output without washing. In that event, by manipulating the valves on the Marcus screen, any of the following grades can be produced: Lump, nut, lump and nut mixed, or run-of-mine.

The circulating water overflowing the settling tank, carrying in suspension a large quantity of fine coal, is pumped to a 70-ft. Dorr thickener, set at an elevation above the jigs. Two of these thickeners have been installed, the second one to be used as output increases. The clarified water from the Dorr machines returns to the jigs by gravity. This feed water to the jigs may be fed to the machines either above or below the plungers or to both places, as expediency may require. Fine coal from the Dorr machine consisting of 50 per cent solids and 50 per cent water, is sluiced to the main washed-coal conveyor and thence delivered to the washed-coal railroad bin. In transit it falls on the coarse washed coal, the water filtering to the bottom of the dragline conveyor, in the trough of which are three sections of thin copper plate perforated with fine slots which allow all water, free of coal, to return to the settling tank.



Cast-Iron Jig with Rotary Valve Mechanism

This is a view on the floor below that shown in the preceding illustration. There has been much controversy as to the relative merits of wood, concrete, cast iron and structural steel a materials of jig construction. It would appear that each has its place where it will serve to best advantage.

The operating officials of the Republic Iron & Steel Co. have furnished the following information:

Inasmuch as the output of the Risco mine has not been up to full capacity of the present jig equipment, rewash tables have not been installed and no thorough test of washer efficiency has been made. However, the following tests of operation show approximate results obtained at reduced capacity. Adopting 1.35 as the specific gravity of pure coal, the percentage of coal and impurities in the product going to the washer are as follows:

Flotation Test of Crushed Run-of-Mine Coal with Analysis

	Class Specific Gravity	Amount, Per Cent.	Ash Content, Per Cent.
Pure coal.....	1.35	78.7	7.28
Impure coal.....	1.35 to 1.40	4.7	14.19
Impure coal.....	1.40 to 1.45	4.3	18.24
Impure coal.....	1.45 to 1.50	2.4	22.13
Impure coal.....	1.50 to 1.55	1.2	28.51
Impure coal.....	1.55 to 1.75	1.5	35.85
Impure coal.....	1.75 and over	7.2	72.14

The average analysis of run-of-mine coal is: Volatile matter, 27.75 per cent; fixed carbon, 55.50 per cent; ash, 16.75 per cent; sulphur, 0.90 per cent.

Average quantities, by sizing test, are shown herewith.

Sizes and Percentages of Each of Varying Specific Gravities

Size	Per Cent	1.35 Specific Gravity	1.35 to 1.45 Specific Gravity	1.45 to 1.55 Specific Gravity	1.55 to 1.75 Specific Gravity	Per Cent sink at 1.75 Specific Gravity
1 in. to 3/4 in.....	18.8	60.7	12.6	3.9	3.3	18.9
3/4 in. to 3/8 in.....	45.1	79.0	9.9	3.9	2.6	4.6
3/8 in. to 20 mesh.....	27.0	89.5	3.5	1.9	1.6	3.5
Through 20 mesh.....	9.1	89.6	.....	.....	10.4	.....
Whole sample.....	100.0	79.7	17.8	3.0	3.2	6.3

The average analysis of the washed product is: Volatile matter 28.50 per cent, fixed carbon 62.25 per cent, ash 9.25 per cent, sulphur 0.80 per cent.

Loss of coal of 1.40 specific gravity in refuse, averages about 1.4 per cent. This can be materially reduced by rewashing the crushed bone on tables, as contemplated in the original plans of the plant. Total washer loss is 8.5 per cent to 9.5 per cent refuse.

Since this plant has been in operation, the mine has been producing coal largely from narrow work. Machine cutting on the narrow work on the bottom increases the amount of impurities in the fines, therefore, there has been no opportunity to bypass the 3/8-in. coal without washing and it is not possible to say if this plan will be feasible when a larger amount of coal is received from the mine. However, in the design of the plant it was arranged that should the 3/8-in. coal be too high in ash, this product, together with the recrushed bone from the second-compartment of the jigs, will be washed over tables. This should insure almost a 100 per cent recovery of coal in this washery.

By using Dorr thickeners, all fines from 60 to 200 mesh are removed automatically from the circulating water. Tests made in another plant show that return water from these machines carried only 0.15 per cent solids. Water going to these thickeners contains 6 to 8 per cent solids. The ash in the final product, using the tables to be installed, should be reduced to 8 or 8.25 per cent, as against a theoretical 7.28 per cent ash at 1.35 sp. gr.

Water circulated per jig is approximately 1,300 gal. per minute, the capacity per jig is 70 tons per hour. Make up water is equivalent to the amount of moisture loaded in the coal, that is, about 10 per cent when the draining conveyor is not operating. This is equivalent to approximately 25 gal. per ton of coal washed. When the draining conveyor is operating, there is practically no water lost at the plant as coal is loaded out containing only approximately 8 per cent moisture.

BREAKERS MAKE INCREASED OUTPUT POSSIBLE

The Flat Top mine of the Sloss-Sheffield Steel & Iron Co. produces Mary Lee seam coal and the entire output is crushed and washed. The plant contained, originally, crushing rolls and six two-compartment double-plunger jigs made by the American Coal Washer Co. These are modified Faust type machines having the driving mechanism located below them.

For several years, prior to 1921, the average yearly





Washery at Bayview Mine, Tennessee Coal, Iron & Railroad Co.

At the left appears the mine headframe, at the right the washery and near the center the conical sludge separation tank. This means of clarifying the circulating water is extremely simple and effective. The clarified water leaves the cone at the top and the sludge is drawn off at the bottom.

run-of-mine output was 408,716 tons. The washed-coal produced averaged 9.88 per cent in ash and the refuse from the washer contained 8 per cent of good coal. In 1921, it became necessary to increase the capacity of the mine; but neither the crushing plant nor the jigs could handle an increased output satisfactorily.

A Bradford breaker was installed and the two-compartment jigs were converted into single-compartment machines of double length. For 1922 and 1923, the average output of the mine was increased to 604,346 tons. The ash content of the washed coal averaged 9.11 per cent, and the loss of coal in the washer refuse ran 9.1 per cent. Unfortunately, the changes were made simultaneously and it is not possible to determine just how much of this increased capacity resulted from the installation of the Bradford breaker and how much from the change in the jigs. The company's engineers are satisfied, however, that the change in design of the jigs has increased their capacity.

Of the six jigs as originally installed, five were used for primary washing and the sixth to rewash the slate and hutch from the last compartments of the five primary machines. Under the new arrangement all six jigs are used as primary washers and no rewashing is necessary.

#### CONICAL TANKS RECOVER SLUDGE EFFECTIVELY

The Tennessee Coal, Iron & Railroad Co.'s washer, at Bayview mine handles only Pratt seam coal from the Bayview operation. The plant contains three, three-compartment Elmore jigs. The run-of-mine coal is first taken to a Bradford breaker. The portion passing through the breaker screen is reduced to  $\frac{3}{4}$  in. and smaller. It is then delivered to the jigs. In normal operation all the sludge is carried to the top of a conical tank.

If any delays occur, such as might arise from the breaking of an elevator or a main supply water line, all the circulating water from the washing plant is immediately drained to a ground sump in front of the cone sludge tank. When the plant is ready to resume operations, this water is elevated into the sludge tank and work started. This sump is necessary because all the drainage from this washing plant finds its way to the main water supply of the company's furnace and steel plant at Ensley, so every precaution has been taken

to prevent impurities reaching this supply. In a four-day test, it was found that the fine coal carried off by waste water from this washer amounted to only 8.7 lb. per 1,000 tons of washed coal produced.

Provision has been made for loading lump but under normal conditions all of the coal is treated in the washer. Considering the tonnage produced and the quality of the product one cannot fail to be impressed by the small size of this washing plant. This is partly because rewash jigs and tables are not used. The product coming from the last refuse valve on each jig is high in ash but as it makes a satisfactory boiler coal the company has found it cheaper to use it for steam raising (it is equivalent to only 6.53 per cent of the total raw coal) than to install the necessary rewash jigs or tables.

For the year 1923 the results shown in Table II were obtained at this plant; the data were furnished by the engineering department of the owning company.

Table II—Results Obtained at the Tennessee Company's Washery at Bayview Mine

	Per Cent	Tons	Tons
Raw coal delivered to washer.....			494,733
Washed coal to coking ovens, 1.37 sp.gr.....	82.05	405,931	
Boiler coal to steam plants, 1.37 to 1.56 sp.gr.....	6.53	32,295	
Refuse over 1.56 sp.gr., 11.42 to 5.4 percent float..	10.81	53,489	
Washer loss float at 1.36 sp.gr. in refuse.....	10.61	3,018	
	100.00		494,733

Number of 9-hr. shifts worked.....	56
Tons of raw coal per shift.....	87

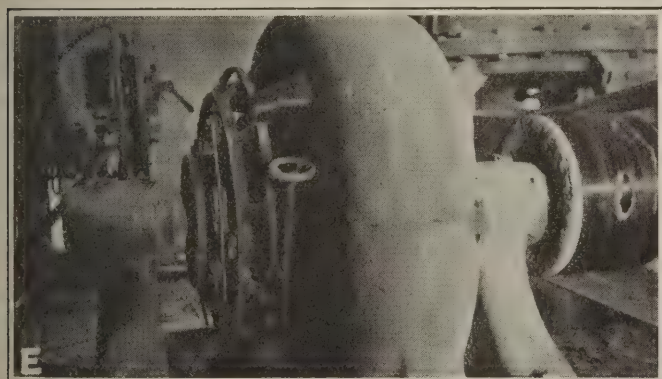
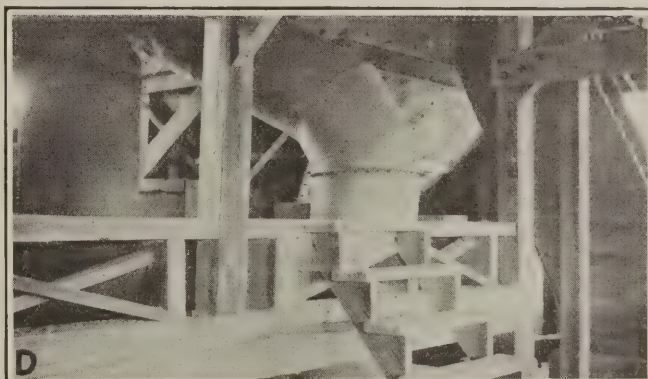
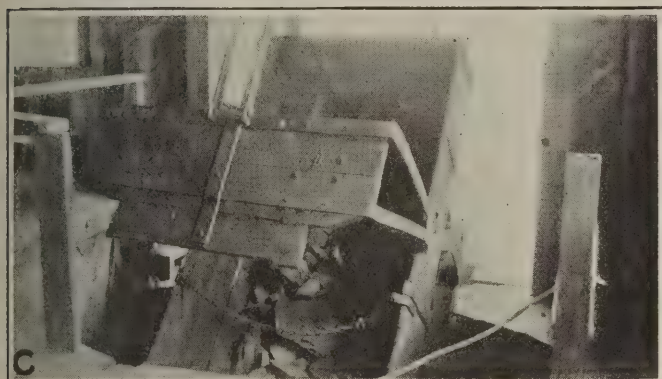
Coal	Proximate Analysis Volatile Content, Per Cent	Fixed Carbon, Per Cent	Ash, Per Cent	Sulphur, Per Cent
Raw coal.....	26.42	61.14	12.44	1.76
Washed coal.....	28.18	67.06	4.76	1.30
Boiler coal.....	25.45	59.73	14.82	2.25
Refuse float (5.4 per cent).....			5.19	1.49
Sink (94.6 per cent).....			62.81	4.74

Sizing Tests			
Raw coal.....	Over $\frac{3}{4}$ in.	9 per cent	Note that per cent of sizes is highly variable.
Washed coal.....	Over $\frac{3}{4}$ in.	19 per cent	
Boiler coal.....	Over $\frac{3}{4}$ in.	20 per cent	
Refuse float (5.4 per cent).....	Over $\frac{3}{4}$ in.	14 per cent	
Sink (94.6 per cent).....	Under $\frac{3}{4}$ in.	42 per cent; ash 7.3 per cent.	
Inherent ash in coal at 1.37 sp.gr.....			4.2 per cent
Inherent moisture in coal.....			3.2 per cent
Washer efficiency: separation.....			88.23 per cent
recovery.....			99.39 per cent
Total efficiency.....			87.69 per cent

Water in circulation at this plant amounts to 600 gal. per ton of coal washed per shift or approximately 970 gal. per minute. Water lost amounts to 27 gal. per ton of coal washed. The average amount of power used equals 1.24 kw.-hr. per ton of washed coal produced.



## Modern Methods Are Used in Making Rock Dust on a Large Scale at Old Ben No. 9 Mine



**Rock-Dusting Plant Where Hard Rock Goes in One End and Fine Pulverized Dust Comes Out the Other**

A. Electrically-operated plant where the stone is pulverized and delivered to the mine car tracks. B. The rock is gathered into ordinary mine cars which are assembled at the foot of a plane leading to the top of the pulverizing plant. C. A car on the tipple discharging its load of rock. D. Pulverizer unit from which the rock is conveyed to the screens. E. In spite of the large quantities of dust in the air this motor gives little or no trouble. Incidentally the rock dust would prevent the spread of a fire in the wood-stucco building. F. Here's where the dust is delivered and may be packed in bags so that it may be transported about this mine or among the various other mines.

WHEN the officials of the Old Ben Coal Corp. operating in southern Illinois decided they were going to use rock dust to keep the mines safe they built a modern plant capable of turning it out in large quantities. Every modern means of conveying the material to and from the plant has been employed. Loaded cars into which the selected rock has been loaded are raised to the top of the building by means of a small cable hoist. When the car reaches its destination its contents is dumped into a bin and conveyed to the pulverizer. Motor-driven equipment reduces the rock and blows it through the sizing screens. On the outside of the

building the rock dust drops through a canvas pipe into sacks and cars.

Unlike the methods employed at many other mines, the Old Ben Coal Corp. has a systematic way of handling its whole plant. When our British visitors last spring wanted to see how rock dust was made and used in this country they were taken to this mine and there they were shown the complete process. Those who witnessed the demonstrations—proving the efficacy of rock dust staged by the officials of this company—have something worth while to remember about ways to make the mines safer.



# Alabama Has Made Great Progress in Coking Coal

Advanced Rapidly from Pre-War Smelting with Charcoal to Today's Oven Capacity of 7,836,000 Tons of Raw Coal—Leads the Country in Substituting Byproduct Units for Beehives\*

BY F. W. MILLER

Manager, Byproduct Dept., Sloss-Sheffield Steel & Iron Co., Birmingham, Ala.

**P**RIOR to the Civil War, there were several small charcoal furnaces for smelting the brown limonite ore that is found, in comparatively small bodies, throughout the central and north-central portions of Alabama. During the Civil War, these furnaces furnished charcoal iron to the Confederate government. No attention was paid to the large bodies of lime-bearing hematite ore that now supply the bulk of the ore used in the various blast-furnace plants of the Alabama district until the latter part of the 19th century.

When it was found that these ores could be worked satisfactorily in the blast furnaces, there was a comparatively rapid growth in the blast-furnace industry in the Birmingham district. As these ores are far more refractory than the limonite ores, this blast-furnace development was accompanied by the construction of beehive ovens to carbonize the coal, in order to supply the necessary fuel. The state's production of beehive coke in 1880 was 60,781 tons; ten years later this had increased to 1,072,942 tons; and in 1897 the production had reached 1,443,017 tons.

In 1898, the first byproduct plant built in the state was put in operation. This plant consisted of 120 horizontal-flue Semet-Solvay ovens, three flues in height by thirty flues in length with an average width of 16 in. The plant was constructed by the Semet-Solvay Co. for the Tennessee Coal, Iron & R.R. Co. and was located adjacent to the blast-furnace plant of that company

at Ensley. Coal was delivered from the Pratt mines by gravity tracks directly into bins of the ovens after having been properly crushed and washed at the mines. The coke was delivered by the Semet-Solvay Co. into coke bins of the blast furnaces directly from the quenching cars.

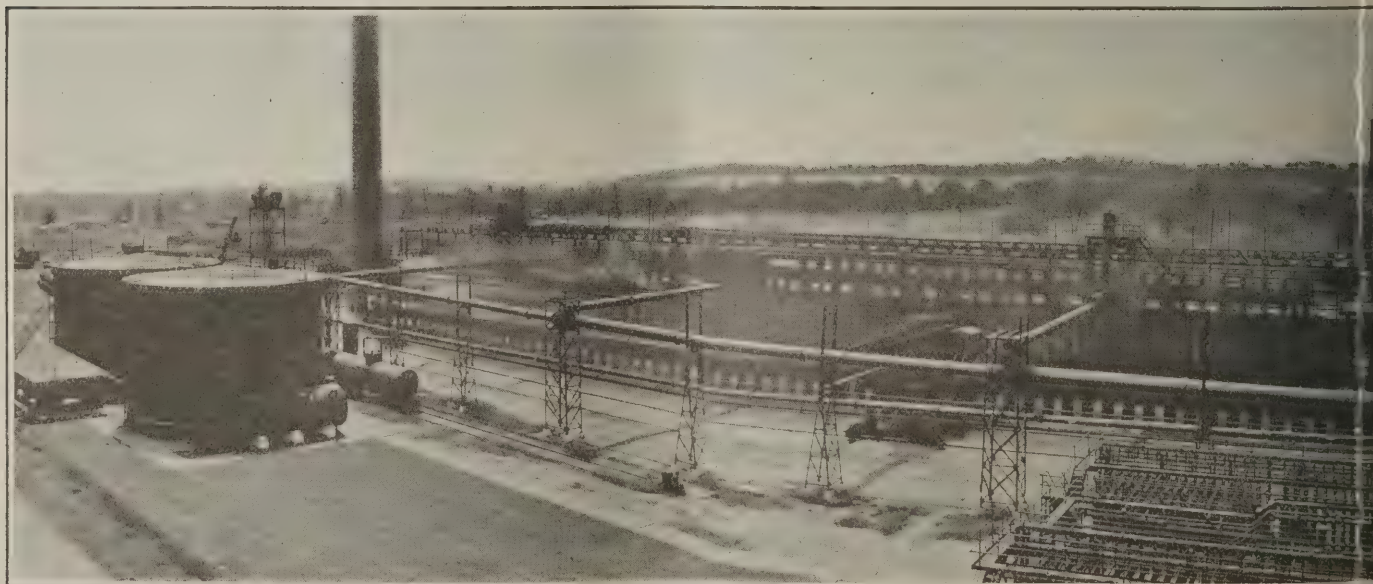
The coke production in 1898, for the entire state, was 1,663,000 tons; and in 1900, 2,110,837 tons. In 1902, four additional batteries of Semet-Solvay ovens were added to this plant. These later ovens were of the same dimensions but were four flues in height; that is, the heating wall was 80 in. high instead of 60 in., and the total coke production for the state increased to 2,552,246 tons.

In 1906, the Semet-Solvay Co. constructed, for the Central Iron & Fuel Co., at Holt, forty Semet-Solvay ovens of the cold-air type. These ovens are 100 in. to the coal line, 16 in. average width, and 30 ft. in length. No more byproduct ovens were added until 1911-1912, when the plants of the Woodward Iron Co. and the Tennessee Coal, Iron & R.R. Co. were constructed. The Woodward plant consisted of 170 Koppers ovens and 60 Wilputte ovens.

In 1911, the Tennessee Coal, Iron & R.R. Co. constructed four batteries of Koppers ovens 19½ in. wide, 8 ft. 6 in. to the coal line and 37 ft. 3 in. long. The plant at that time had an annual capacity of 2,146,000 tons of coal. In 1920, this company added two batteries of 77 ovens each, bringing the total number of ovens in this plant up to 434 and increasing its annual coal capacity to 3,340,000 tons.

This plant now supplies all the coke required by

\*Article entitled "Byproduct Coking in Alabama" to be read before the American Institute of Mining & Metallurgical Engineers, Birmingham, Ala., Oct. 13, 1924.



Two Batteries of Semet-Solvay Byproduct Ovens at the Plant of the Sloss-Sheffield Steel & Iron Co., Birmingham, Ala. Tar Tanks, Cooler Coils, Coal Bin, Pump House, Primary Coal



eleven active blast-furnace stacks of the Tennessee Coal, Iron & R.R. Co. and, in addition, is capable of handling some coke for the commercial market. In 1913, the coke production of the state had risen to 3,323,664 tons, 2,022,959 tons of which was byproduct coke and 1,300,705 tons was beehive.

In 1917, the Gulf States Steel Co., located at Alabama City, placed in run its byproduct plant of 37 standard Koppers ovens with an annual capacity of 250,000 tons of dry coal.

As a result of the stimulus of the World War, the Alabama Byproduct Corporation constructed at Tarrant, a suburb of Birmingham, fifty Koppers ovens having an average width of 16 in., height to coal line, 9 ft. 10 in. and a length of 37 ft. The Sloss-Sheffield Steel & Iron Co. began the construction of 120 Semet-Solvay ovens with an average width of 18½ in., height to coal line 11 ft. and a length of 36 ft. These ovens, which have the largest coking chambers of any ovens in the state, have a capacity of approximately 15 tons of coal per oven charged and an annual coal capacity of 970,000 dry tons. In 1923, the Alabama Byproduct Corporation added twenty-five ovens of the same capacity to their original battery, bringing the annual coal capacity to 456,000 dry tons.

The total coke production of the state for 1923 was 4,200,000 tons of which 268,000 tons was produced in beehive ovens and 3,932,000 tons in byproduct ovens. This means that less than 7 per cent of the total coal carbonized for metallurgical purposes in the state was carbonized in beehive ovens.

It is hardly necessary to go into the fundamental causes of this rapid displacement of the beehive by the byproduct oven. The byproduct oven represents a much larger capital outlay per ton of coal carbonized, but the byproducts are fully capable of carrying this increase. The more uniform grade of coke, the direct saving of coal through yield of coke, the conservation of coal resources and the reduction of labor cost, together with more favorable working conditions for labor are the major factors.

It is, however, noteworthy that Alabama, which has always enjoyed a plentiful supply of common labor

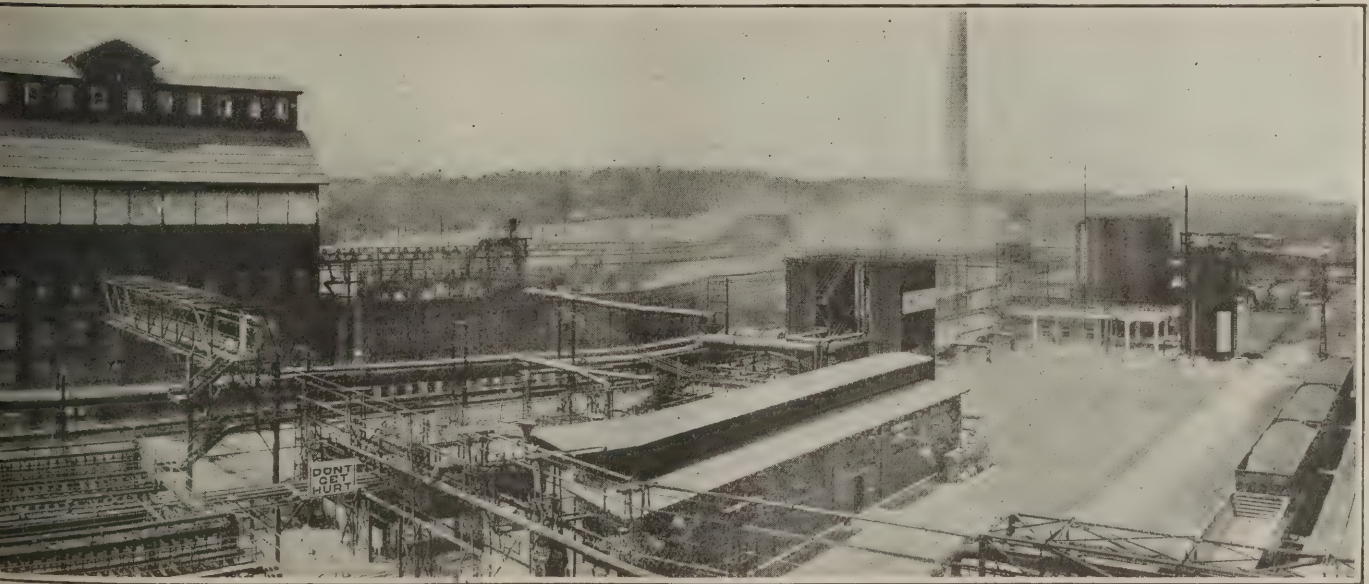
at comparatively low rates, has outstepped her sister states in her progress in coking. The annual capacity, in tons of dry coal, for this district is as in the accompanying table.

Byproduct Coking Plants in Alabama with Their Capacities	
	Tons, Dry Coal
Semet-Solvay Co., Ensley .....	730,000
Semet-Solvay Co., Holt .....	330,000
Woodward Iron Co., Woodward.....	1,760,000
Tennessee Coal, Iron & R.R. Co., Fairfield.....	3,340,000
Gulf States Steel Co., Alabama City.....	250,000
Alabama By-Product Co., Tarrant.....	456,000
Sloss-Sheffield Steel & Iron Co.....	970,000
	7,836,000

It will be noted that the combined coking capacity of all of these plants, if operated at their maximum production rate, will be equivalent to the consumption of 7,836,000 tons. Assuming an average yield of 75 per cent of furnace fuel, these plants will produce annually 5,362,000 tons of coke. As the maximum quantity of coke so far produced in the state in any one year (1917) was 4,892,589 tons, even when allowance is made for improvements in furnace capacity, which have been steadily taking place, the byproduct ovens are capable of producing all the coke required by the state without any assistance from the beehive ovens whatsoever.

There is no district in the United States in which the substitution of the beehive oven has been so complete as in the State of Alabama. The districts of Chicago, Detroit, Buffalo, and a few other points, of course, have no beehive ovens. The development of these points represent a transference of the coking operation from the mine mouth in Pennsylvania, Kentucky, and West Virginia to the point of demand. This transfer has been justified by the production of coke-oven gas for domestic and industrial uses and by making available valuable byproducts nearer the point of consumption.

As the South is proportionately the largest consumer of ammonium sulphate, practically all the ammonium produced by the Alabama byproduct ovens is produced in the form of ammonium sulphate and marketed to the various manufacturers of commercial fertilizer.



Sloss-Sheffield Steel & Iron Co. at North Birmingham, Ala. This View Shows Also Benzol Scrubbers, Fuel-Gas Equalizer and Exhauster Building



As the Birmingham district is the largest producer of cast-iron pipe in the world, it is also the largest consumer of coal tar for the dipping of pipe manufactured in this district.

The development of blended motor fuel has probably been carried further in the Birmingham district than anywhere else in the United States, and consequently almost the entire production of benzol is consumed within a short radius of Birmingham, by the automotive industry. During the late World War, practically all of this benzol was converted into pure products and consumed by the manufacturers of munitions.

The coke-oven gas from the various plants is largely consumed by industries and municipalities. The plant of the Sloss-Sheffield Steel & Iron Co. supplies domestic gas of approximately 550 B.t.u. to Birmingham through the Birmingham Electric Co. The Holt plant supplies gas to Tuscaloosa and to the ore-nodulizing plant of the Central Iron & Coal Co. The Tennessee Coal, Iron & R.R. Co. consumes its gas in its steel plant. In addition, it receives about 6,000,000 to 7,000,000 cu.ft. daily from the Semet-Solvay Co. at Ensley. The Alabama By-Product Co. has a 3,000,000-cu.ft. holder, in which it stores the surplus gas produced at night, thus making all its surplus gas available during the day. This has enabled the company, through a subsidiary pipe-line company, to supply gas to several large consumers.

The Gulf States Steel Co. consumes its surplus gas within its own steel plant, and the Woodward Iron Co. uses its gas under boilers, supplementing its blast-furnace gas to produce steam not only for its furnace plant but to supply power for its mines and other activities.

The boiler and power plant of the Sloss-Sheffield Steel & Iron Co., located at its byproduct plant, has a battery of eight Stirling boilers equipped to burn coke-oven gas, coke breeze in Coxe stokers, and pulverized coal. This power plant supplies the company's coal and ore mines, its quarry, two of its furnaces, in addition to its byproduct plant requirements. It also sells power. Extreme flexibility is required in order to be able to supply gas to the city in quantities varying over wide limits with the seasons and to take care of the rapid hourly fluctuations of its mine load.

Inasmuch as the conversion from beehive carbonization to byproduct coking has been so complete, the construction of byproduct ovens will be relatively slower, as it will be forced to follow the development of the blast furnace and steel industry. However, as the South is now consuming the greater part of the iron produced in this district and this southern demand is growing rapidly, additional blast furnaces, and probably steel plants, will be constructed and the building of byproduct ovens will keep pace with this development.

THE ROYAL COMMISSION ON MINING SUBSIDENCE, states *The Iron and Coal Trades Review*, proposes to visit Scotland on Oct. 16 and 17 for the purpose of obtaining by personal inspection of typical cases direct evidence of damage caused by subsidence.

The Commission is in consultation with the various Scottish Local Authority Associations with a view to selecting a number of representative cases. Damage to private property will be inspected, as well as local authority and similar undertakings. It is probable that the Commission will visit the Lanarkshire coal field Oct. 16 and the East of Scotland on Oct. 17.

It is not proposed to hear any oral evidence during the visit to Scotland, since the view of the Commission

is that evidence of this type can be heard more satisfactorily and with greater economy of time in London. Only a limited number of places can be personally inspected. In regard to evidence generally, the Commission is always glad to receive and consider photographs and statistics. In this connection the Commission desires it to be understood that what it wishes to obtain are brief descriptions of a few typical cases of severe damage, general statistics of costs incurred over a period of years, particulars of mineral reservation clauses in typical leases, reasoned and detailed proposals for the solution of the problem as a whole and similar evidence of a general and concise nature.



**There's No Squalor in This Coal Camp**

The town of Mohrland, Utah, at one of the United States Fuel Co.'s mines, is nestled in a place in the Wasatch range which gives it natural attractions and a wonderful outlook which are poorly shown by this photograph. There is plenty of room and fertile soil for grass plots and gardens and the houses are comfortable and kept in good repair. The company's community amusement hall is shown at the left.



# Alabama Coal Mining Methods Vary Widely

Seams 24 in. to 13 ft. Thick Lying in All Positions from Flat to 90 Deg. Pitch Test Engineers' Ingenuity—Panel and Longwall Systems Common—Drag Loaders Are Saving 25 to 50 Cents a Ton

BY MILTON H. FIES

Vice-President, De Barbelben Coal Corporation,  
Birmingham, Ala.

ALABAMA coal is won from thirty workable coal beds that range in thickness from 2 ft. to 13 ft., with an average thickness of 4 ft. The principal producing beds in the Warrior field are flat, or nearly so, whereas those of the Cahaba field range from slightly tilted to comparatively heavily pitching beds. It is to be expected that, on seams from 2 to 13 ft. thick, pitching from 0 to 90 deg., nearly all mining methods are used; hence a description of such methods must be more or less general.

Mines in Alabama are opened, generally, through drifts and slopes, although there are some vertical shafts in the state. The principal method of mining is the ordinary room-and-pillar. A modified longwall system is being used in several mines in the Cahaba field on pitches, and modified longwalls, or panels, are being used in several mines of the Warrior field.

To mine seams under 36 in. successfully the conditions must be favorable. Most of the thin seams mined lie flat. It has been found unprofitable, with very few exceptions, to mine thin seams that pitch. In most instances, thin seams are mined through drifts opened on the coal, although in a few cases such seams are reached by means of short slopes or shallow shafts.

Where this type seam is mined through drifts, the coal outcrops in hollows, and tram roads are graded along these hollows. Drifts or entries are turned into the hills, usually at room distances apart, either with double entries or an air course with each entry. Where the dip does not prevent, rooms are turned from both entries in a double-entry system or from the entry and the air course.

The depth of the rooms in thin flat coal varies from 125 ft. in 26 or 28-in. seams to 175 ft. in 36-in. seams. The thickness of pillars varies from 10 ft., where rooms are 20 or 30 ft. wide, to 40 ft. with 40-ft. rooms. The thickness of cover runs from 40 ft. to 300 or 400 ft.

A panel system in use in a drift mine in thin coal is shown in Fig. 7. The main entry, *A*, is opened from the surface and the main face entries, *B* and *C*, are parallel to and 1,600 ft. from it. Main butt headings, from which no rooms are turned, connect *A*, *B* and *C*. Double entries *D* and *E*, five to a panel, are turned from the main and main face entries. Each panel is surrounded by a barrier pillar that is ample to protect it. The headings *D* and *E* in each panel are developed by double gob entries, as shown in Fig. 8.

Rooms are turned on 80-ft. centers, each room having a double neck and with a double track. After the room is driven in from 50 to 65 ft., it is widened to connect with an adjoining room, until five rooms are connected. This affords a 400-ft. face, which in some instances has

been carried forward for 70 ft., although this face usually advances in steps.

To afford the miner an opportunity to load, switches are laid from the room track or, in some instances where the top permits, the track is curved around the face. A solid pillar 40 by 145 ft. is left after five rooms are turned. When expedient, pillars such as this are left, so that on one entry the pillar comes beyond room No. 5 and in the next entry beyond room No. 7.

The purpose of this panel system, in thin coal lying flat, is to afford means for robbing each entry as it is worked to its limits by leaving pillars of sufficient size to obtain a maximum recovery. The recovery of pillars in thin coal is difficult at best, and it has been found satisfactory to leave short thick stumps rather than long thin pillars, as was the practice in Alabama until recently. Of course, this method can be applied only where the ownership is in fee. Where the ownership does not include the surface, rooms 30 to 40 ft. wide, depending on the top, are turned with pillars from 10 to 20 ft. in width, depending on the depth of the overlying strata.

In the gob entries, which are driven usually to a height of 5 ft. 2 in. above the rail, 36 to 44 in. of rock above the coal is shot down and gobbed. The entries

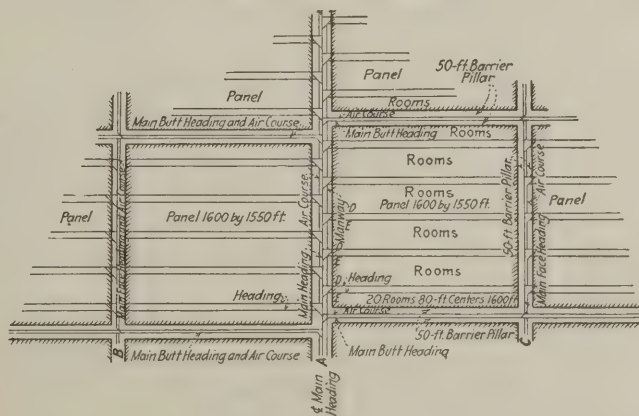


Fig. 7—Drift Mine Panel System

This layout is used in thin coal. The main entry is opened from the surface and the main face entries are parallel to and 1,600 ft. from it. Butt headings connect the face entries.

driven in the coal are of sufficient width to provide room for this rock. In coal 30 in. thick with entries clearing 5 ft. 2 in. above the rail, the entries must be driven 28 ft. wide in the coal to take care of the rock in an entry of standard width; i.e., 9 ft. wide at the bottom and 7½ ft. wide at the top. The cost of such yardage varies from \$2.56 to \$4.50 per running yard, depending on the thickness and hardness of the rock; the cost of yardage per ton varies from 25 to 40 cents.

When the hardness of the rock necessitates, drills with portable air compressors are used for drilling rock holes. Where such drills are used, it is common for

NOTE—The second part of a paper entitled "Alabama Coal Mining Practices" to be read at the Birmingham meeting of the American Institute of Mining and Metallurgical Engineers, Oct. 13.



the miner to drive his entry into the coal, say from 60 to 100 ft. ahead of his brushing. He then comes back and sets his breaking timbers, after which the drill runner spends the entire shift in the entry drilling the rock. A disadvantage of this method is that the miner cannot load coal each day, and utilizes his spare time for handling his rock, but it enables the drill runner to accomplish better results for he does not have to transfer his drill and compressor during the shift.

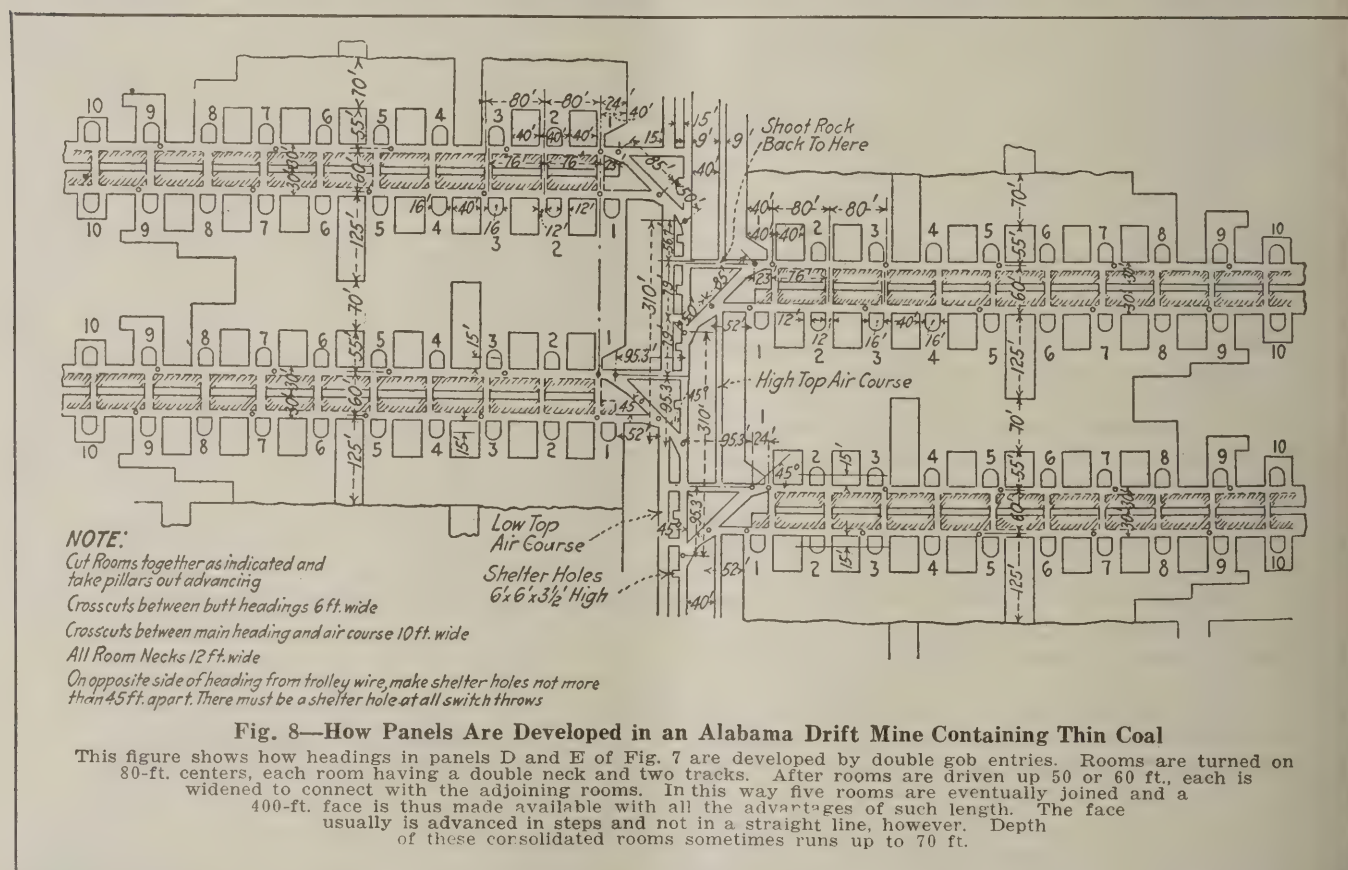
Coal lying as described is usually undercut with electric machines of the low-vein type. In some instances, one track of the room is brushed, that is, from 6 to 18 in. of rock is taken down over the roadway to admit the machine.

There are some modifications of the method described

occurred and the fall rode the face to a slight extent. The wall was then cleared and, instead of using timbers along the face, cribs were built every 10 ft. and left in place. The result was the overburden crushed the cribs located back from the face and no falls occurred at the face.

From an application of this system an apparent saving of 25 to 50 cents per ton has been effected, when the work progressed smoothly. In addition, the lump percentage was increased. The problem is one of control of roof subsidence, which must be worked out through experience, and the training of labor that has had no previous experience on walls.

Mining a flat seam of medium thickness is somewhat different. Much of the coal used in the manufacture



of mining thin coal lying flat. At one mine, in 30-in. coal, an experiment is being made with mechanical loading. While this method bids fair to prove successful, its consummation is not definitely assured.

Two cross entries, as indicated in Fig. 9, were turned 245 ft. apart in a drift mine. A pillar 75 ft. wide was left to protect the main entry and the cross entries were connected. In one cross entry, A, the bottom was taken up instead of brushing the top; in the other entry B, the top was brushed to entry height.

The face, or wall, 200 ft. in length is mined advancing. The coal is undercut with a chain machine, with 6-ft. cutter bar. Four rows of heavy timbers, set about 4 ft. apart were placed up to a point 5 ft. from the face, and, as the wall advances, the rear timbers are removed. A drag loader, 4 ft. wide, loads the coal directly into the cars placed in entry A, which is driven 250 ft. ahead of the wall.

Cribs placed "skin to skin" in two rows protect both entries. When the wall had advanced 100 ft., a break

of coke for the blast furnaces of the state is mined from such a seam—the Pratt. In the smaller mines, the prevailing method of mining is to drive a main opening through the center of the area to be worked. This opening is driven for single or double track, depending on the tonnage desired. It is necessary to blast down about 18 to 24 in. of roof to give height for a good haulageway. In some mines, a slab is driven with the haulageway wide enough to gob all the brushing rock; in other mines, the brushing rock is hauled to the surface, or gobbled in crosscuts, and rock eyes cut at intervals along the ribs.

An airway 12 ft. wide is driven on each side of the main haulageway, a pillar 30 ft. thick being maintained. Room entries are turned from the main haulageway measuring approximately 300 ft. center to center. After allowing 18 ft. for the width of the entry including the slab, 20 ft. for the airway pillar, and 12 ft. for the width of the airway—a total of 50 ft.—there remains 250 ft. for the length of the room. This is



Experience with mechanical loading, generally in Alabama, is more or less a matter of conjecture; its success has not been proved. On account of the partings in the



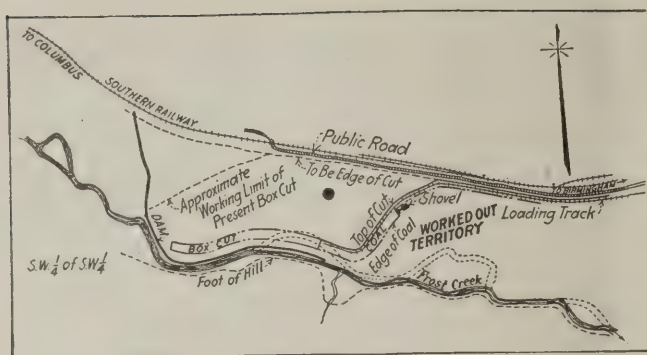


Fig 11—A Successful Strip Operation

Coal 42 in. thick but with a 4-in. parting is uncovered by a shovel equipped with a 2½-yd. bucket on a 60-ft. boom and loaded by a smaller shovel. A dam protects the workings against flooding. In most of Alabama's 10 strip pits the labor cost of coal loaded on railroad cars is from 50 to 70 per cent of the cost entailed in underground mining.

thicker seams, mechanical loaders of the Joy type have not been used.

Thick seams lying flat are mined in practically the same manner as thin seams and those of medium thickness. The rooms are deeper and the development neces-

heel, or knee, on the loose end and in the center of the undermined half of the face. These knees are cut out before the shots are fired. After the miner has undercut the coal as shown, he must stand up while he cuts out the heel, so that the hazard from falling coal is minimized. A safety travelway for the miner is provided in all rooms. As shown in Fig. 12, it parallels the room track.

#### POWER STRIPPING AND LOADING PRACTICED

There are eight or ten coal-stripping operations in Alabama, all are on seams that lie flat; coal from 28 in. to 6 or 7 ft. is being mined. From 4 to 40 ft. of cover is removed from coal with shovels of the larger type, the small or loading shovel follows the stripping shovel and loads the coal either into railroad or mine cars. Practically all the stripping coal is washed before it is shipped to the consumer.

A successful operation is shown in Fig. 11. At this operation levees are built and the creek changed when necessary to protect the open cut. The coal is 42 in. thick with a 4-in. parting.

At this mine, the total overburden is prepared for

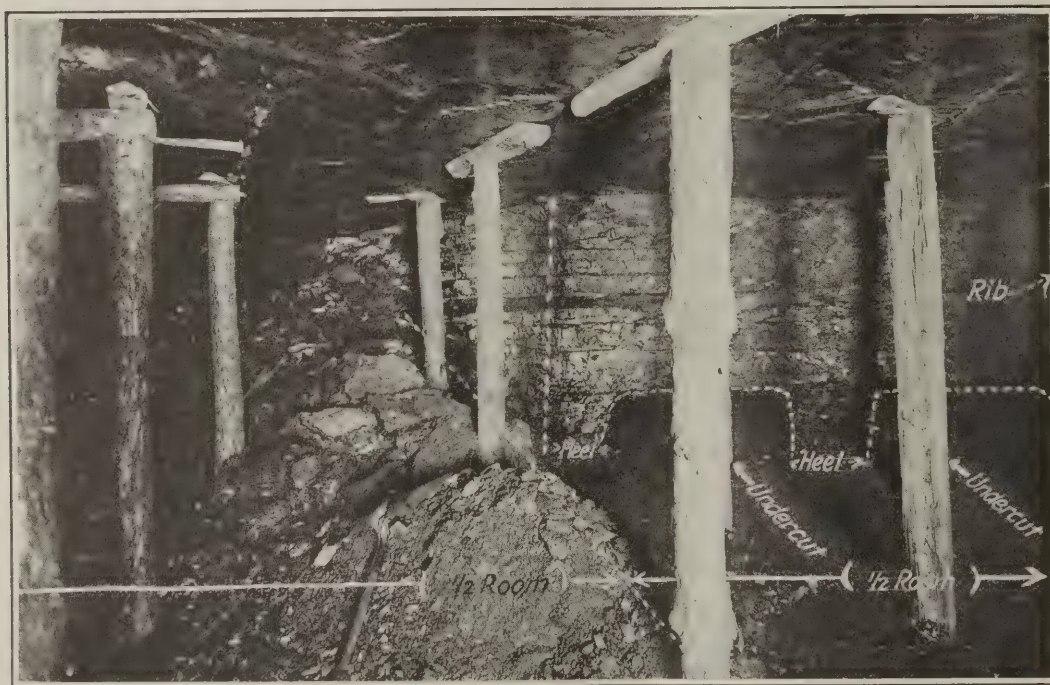


FIG. 12  
Room in a Thick  
Flat Seam

One half of a room's width is driven ahead and the coal is shot down and loaded while the other half is being undercut by hand. The miner must leave a heel or knee on the loose end and in the center of the undermined half of the face. These are cut out before the shots are fired.

sary for a given tonnage is less; the production cost in some instances is only one-half the cost of producing coal in seams 30 in. and under. Under favorable conditions, seams 5 to 10 ft. thick, with partings from 24 to 30 in. are profitably mined. In some cases the miner actually removes and gobs ½ ton of rock for each ton of coal loaded. When mining is done with a chain machine, the bottom bench is shot and loaded, the "middleman" is forced down with a bar or wedge and gobbled and the top coal is then shot and loaded. A section of a seam with a 12½-in. "middleman" so mined is shown in Fig. 10. The washer loss at this mine is in excess of 20 per cent.

A room in a mine on one of the thick seams, lying comparatively flat, is shown in Fig. 12. This illustration shows that one-half of a room's width is driven ahead, the coal shot down and loaded while the other half of the room is being undercut by hand. This is a safe method, for the miner is required to leave a

the stripping shovel by drilling holes, on 18-ft. centers, to within 1 ft. of the coal and shooting them with two and one-half sticks of 40 per cent gelatin, using a 5-in. by 16-in. cartridge. The box cut is approximately 1,100 ft. long, and develops approximately 14 acres or 90,395 tons. The box cut corresponds to narrow workings in underground workings. After the box cut is driven, slabs are removed along the face until the workings advance to their limits, when another box cut is driven into the property.

There are some variations in this method. At some operations, the shovels work in a circle; in others, they work along the side of hills until the overburden becomes excessive. Where conditions are favorable to strip mining, it has been found that the cost of labor per ton for coal delivered on the railroad cars is from 50 to 70 per cent of the cost of underground mining for a seam of like thickness. This constitutes a decided advantage for this method of mining.



# National Safety Congress at Louisville Gives Proof Of Progress During Past Year

Membership Has Gained 14 per Cent—Mining Section Attended by Engineers from All Over Country—Electric Hazards and Organization for Safety Discussed—Adams Throws New Light on Accident Accounting

**A** GAIN of 468 members during the past year raising the membership from 3,321 to 3,789 is a reassuring symptom of the health and vitality of The National Safety Council, now in its thirteenth year. Another healthy sign is that its gross revenue was \$377,448.63 for the fiscal year ended July 31, the membership dues alone bringing in \$187,929.51. Nearly 500,000 copies of the Safety Calendar were distributed.

The attendance at the Louisville Congress was large; just *how* large it was difficult to determine because many who attended failed to register. It seemed, however, to measure up in every way with the best of previous conferences, the mining section having an attendance of 60 to 70 at each of its three meetings.

Stray electric currents and their dangers formed the subject of E. E. Jones' paper at the Mining Section meeting on Tuesday. That paper had reference to electric fuses but J. L. Boardman, safety engineer of the Anaconda Copper Mining Co. declared that two serious accidents had occurred at the Anaconda mine from the premature discharge of shots not thus provided.

George Martinson, safety engineer for Pickands, Mather & Co., Hibbing, Minn., said that at one of the open ore pits of that company forty holes with an aggregate charge of 800 lb. of dynamite had been exploded during a storm. The holes were awaiting the action of the electric battery but the storm delayed the proper firing of the charge which was exploded, however, by the electric discharge of the storm.

He wondered if the wires were twisted the potential in the wires would become uniform so that no current would pass through the detonators. He said it must be remembered that the leads were but indifferently coated with insulating material and were in contact with iron ore which forms a ready conductor for any stray current the earth might contain. Mr. Jones believed that twisting the terminals as described would render the charge safe. Mr. Martinson stated that now the shooting gang when it saw a storm approaching hurried up its shooting to prevent a premature explosion but conditions did not always make such prompt action desirable.

J. T. Ryan said that in a mine at a point about 250 ft. beyond the trolley line a difference of potential of 6 volts between water pipe and rail was observed. One could put off a detonator at any time by connecting it with these points.

"Safety Kinks" was the title of C. L. Colburn's address, his kinks referring solely to meeting the human or moral hazard. He described the steps to be taken to get the men organized for safety and to keep them thinking in that direction.

That we need statistics to sell safety was the conclusion of W. W. Adams. He said that only by a careful statistical record can a sound and reliable basis

be established for the information and guidance of those engaged in accident prevention work and added "Thus also will the work be removed from the realm of things subject to the vagaries of individual judgment and brought into the realm of things concrete and measurable, known alike to all who need the information and not subject to loss with the changing fortunes or the passing of any individual."

Mr. Adams called attention to the need for statistics that will show not only the number receiving injury by reason of any given hazard but also the number exposed to that hazard, thus making it possible to ascertain the accident-frequency and severity rate for each occupation. He gave the accident rates of various mineral industries as in Table I.

Table I—Accident-Frequency Rate for Several Industries

	Per Million Hours
Coal mines.....	96
Metal mines.....	91
Quarries producing crushed stone.....	70
Smelters (not including iron blast furnaces).....	64
Mills.....	62
Beehive coke ovens.....	49
Quarries producing dimension stone.....	47
Byproduct coke ovens.....	47

Quoting the *National Safety News* figures for other industries than mining Mr. Adams gave the severity rates as in Table II.

Mr. Adams' papers showed some extremely interesting tables. From them has been constructed Table III.

J. T. Ryan said that in British and other European mines the percentage of accidents due to roof and sides was even higher than in America and that the British government was offering a prize for the best suggestion for the reduction of accidents of this class.

At Wednesday's session Francis Feehan, mine safety commissioner, U. S. Bureau of Mines, addressed the mining section on "Organizing the Mining Industry for Safety." Though his paper has not yet had the approval of the U. S. Bureau of Mines, it may be permissible to refer to it briefly. Mr. Feehan compared the figures of fatalities per 1,000 full-year workers in the United States, Great Britain, France, Belgium and Prussia since 1911 and showed that with the exception of Prussia the death rate in America's coal mines was approximately 3½ times that in the coal-mining industries quoted.

Mr. Feehan remarked that this was a serious indictment and added, "We lead the world in mining engineering, but we have grossly neglected the most important factor in production which is the conservation of the lives and health of those employed in the

Table II—Severity Rates for Several Industries

Coal mining.....	11.1
Metal mining.....	8.4
Chemical industries.....	4.8
General contractors engaged in construction work.....	4.8
Woodworking.....	3.4
Paper and pulp.....	2.7
Petroleum refineries.....	2.6



Table III—Causes of Temporary Injuries Underground

	Coal Mines		Metal Mines	
	Per Cent of Accidents	Per Cent of Days Lost	Per Cent of Accidents	Per Cent of Days Lost
All underground.....	100.00	100.00	100.00	100.00
Falls of roof and side.....	27.95	33.41	19.80	25.93
Mine cars and locomotives.....	27.55	30.48	17.46	16.46
Handling materials.....	13.00	11.06	17.34	15.68
Hand tools.....	13.66	9.34	10.72	8.76
Machinery.....	6.11	5.59	5.44	5.74
Falls of persons.....	3.64	3.44	7.94	8.48
Electricity.....	1.61	1.22	0.16	0.06
Falling objects.....	1.75	1.20	12.76	10.88
Explosives.....	0.57	0.96	0.47	0.58
Hoisting apparatus*.....	0.43	0.46	1.88	2.21
Explosions and fires.....	0.23	0.23		
Miscellaneous.....	3.50	2.61	6.03	5.22

\* Mr. Adams makes this "Shafts and Cages" in his metal-mine casualty figures

mines." He called attention to the fact that rarely is a mine closed that is in a dangerous condition and said, "How seldom are the mine owner, his officials or the mine workers prosecuted for violating the mining laws?"

With equal energy Mr. Feehan assailed the mine owner and the mine worker, declaring that the latter constantly made the charge that the employer is not concerned about his safety but only about production. "Is not this," said Mr. Feehan, "true also of the mine worker?" Mr. Feehan said the miner frequently failed to make the inspections required by law and as a result was maimed or killed.

Reference was made also to the Gay Coal & Coke Co., Logan, W. Va., that for seventeen years had not had a single fatal accident and yet had put out 2,500,000 tons of coal. Hardly anything in other industries could compare with this record. The general run of industries can be adequately protected by engineering. Almost every condition can be foretold and provided for. But the mine roof is not designed by engineers. It is an uncertain factor of varying quality. In places it is hardly a hazard, in others it is a perpetual menace. We cannot take it down and examine it and then, put it up again if we approve it or send it back to the manufacturer if we don't like it. It is what it is, but in any event we don't know just exactly what it will do.

The railroads have reduced accidents but in their case the blue sky above them is not in constant danger of falling and consequently only in tunnels are there dangers similar to those encountered in the coal mines and where these tunnels can be lined even these dangers are lessened. Moreover transportation underground is made hazardous by the small size of the units making elaborate breaking and coupling devices difficult of installation and by narrow, low roadways.

The problems encountered in mining, said one

speaker, are less amenable to engineering treatment, and furthermore, the decrease in accidents in the last few years may be less in mining than in other industries partly because the mining industry had been planning accident prevention for years and had long been subject to legal supervision and so was already experiencing, before the general reform, the advantage of its own specific reformatations thus making the opportunities for reform in the mining industry less promising than in other industries.

Theodore Marvin in the absence of N. S. Greensfelder delivered the latter's paper on "Safety in the Use of Explosives." Mr. Marvin declared that it was safer for a miner to use explosives than it was for a pedestrian to travel the city streets. About one life was lost for each 4,279 men employed, whereas in 1923 the fatalities from automobiles in the biggest cities have run from one for every 6,571 to one for every 2,633 of population. In some cities there is more risk by far that the ordinary citizen will be fatally injured by an automobile than that the miner will be killed by his handling of explosives.

### THREE TROPHIES FOR ACCIDENT PREVENTION

Mr. Marvin announced that in conjunction with the U. S. Bureau of Mines *The Explosives Engineer* would award three trophies, one to that coal mine, one to that metal mine and one to that quarry open-pit mine which has in any year the least loss of time from all classes of accidents in proportion to total hours of work performed, the accidents ordinarily classified by the Bureau of Mines carrying a double penalty.

To promote safety in the use of electricity J. B. Johnson, mechanical engineer of the United Verde Copper Co., Clarksdale, Ariz., said that for transmission nothing in excess of 6,600 volts should be used underground. It is seldom necessary to use anything over that voltage and unless the underground transmission line is unusually long, say over two miles, the standard pressure of 2,200 volts is sufficient.

Most engineers would say that in coal mines high voltages such as these should not be transmitted underground, but conditions similar to those of metal mines are found where the rising hills and dipping seams make depths prohibitive for shafting or for the lowering of cables in a borehole and in that case an underground transmission line of two miles length at high tension might be desirable.

The main feeder lines carrying 2,200 volts should, Mr. Johnson said, be insulated with a lead-sheath covering and flexible armor should be used. Such a cable is proof against moisture and being flexible can be anchored direct to timber sets or walls of tunnels and drifts. The metal sheaths are proof against stray induction currents. Mr. Johnson declared that the use of standard cable with metal sheaths was not desirable as moisture condenses within the conduits and wherever such construction is used provision must be made to trap the moisture and drain it off at suitable intervals. Mr. Johnson discussed feeder lines in hoisting shafts, electrical hoisting and its safe control.

J. W. Reed declared that he regarded these voltages as excessive but Mr. Johnson declared he was referring only to transmission currents. This did not satisfy Mr. Reed who takes a view somewhat common among coal engineers that high-voltage cables are undesirable in a mine. Metal miners are not so opposed to high potential because it is almost essential under their



C. B. AUDEL

Newly elected President of the National Safety Council. He is safety engineer, Westinghouse Electric & Manufacturing Co.



conditions of operation. With them it is often a choice between high-tension transmission underground or no electrical current. Some coal engineers have gone to high tension even though conditions do not make it so absolutely imperative in coal mines.

In reference to transformer rooms Mr. Hall remarked that it might be well to recommend not only that they be "fireproof and have quick-closing air doors for isolation in case of accident" but that the floor be well sanded, that the doors be held in place by a cord that would burn readily and permit the doors to close in case of fire and that a sort of low dam or sill be built at the entrance that would prevent the issuance of oil should a transformer be destroyed and the oil be precipitated over the floor of the room.

#### CARE IN DETAILS IS NECESSARY TO SAFETY

J. F. MacWilliams' paper on electric starting appliances showed in detail how every fuse or starter should be made a matter for careful study so as to avoid those hazards which even safety devices themselves are prone to introduce. Mr. MacWilliams declared that in the coal-mining regions, the undermining and the fracturing of the ground made the coal measures unnaturally dry and so introduced an electrical hazard, for it was difficult to get a good ground in material so lacking in the power of conducting currents. Quite generally in moist soils one could get, in grounding, a resistance of a half an ohm, but where the soil had been dried by the mine excavations the resistance might rise to 80 ohms.

J. B. Johnson remarked that pipes in the mines furnished a poor ground for they might be dismantled and the ground destroyed. The pipes are not under the electrician's supervision and so may be removed at any time, either entirely or in part, leaving the machinery without a proper ground. Furthermore, in a pipe there might be a gasket that would insulate one part of the pipe from another and thus prevent the transference of the current from the bedplate of the machine to the water in the sump. J. L. Boardman said that accidents from lack of grounding might occur by reason of the anxiety of electricians to get home at night. Some men who were working on a motor at the Butte mines were delayed by the exigencies of the occasion till after whistle-blow. They left without replacing the ground wire. They argued that tomorrow morning would do for the completion of the work, as the motor would not be used during that night. However, it was used, and, not more than five minutes after the electricians left the motor thus unprotected, an accident happened. In another case lights were connected in series, and the wire from these lights passed to a compressed air line which later was broken. A man stepping on the pipe and reaching over to a car was shocked and killed.

The nominating committee recommended the following members of the mining section for election: R. Dawson Hall, engineering editor, *Coal Age*, New York City for chairman; J. L. Boardman, safety engineer, Anaconda Copper Mining Co., Butte, Mont.; J. W. Reed, safety engineer, Consolidation Coal Co., Fairmont, W. Va.; R. B. Ageton, Tristate Zinc & Lead Ore Producers' Association and A. A. Bowden, safety engineer, Pickands, Mather Co., Ironwood, Mich., as vice-presidents; T. T. Reed, director of Safety Service of the U. S. Bureau of Mines, was nominated secretary. The men whose names were presented were duly elected. It was decided to form two committees, one

on collegiate education in safety and the other on elementary education on the same subject. It was suggested that the Bureau of Mines might be induced to prepare and publish an elementary textbook on the subject of safety. J. L. Boardman said that at least 40 per cent of the questions in a foreman's examination should deal with safety exclusively.

In the round-table discussion that followed Francis

Feehan answered some exceptions taken to his paper and particularly to his statement that employment in mining can be made safer than in any of our large industries. It is encouraging to learn from this that coal mining is an inherently safe industry.

At the annual banquet Col. A. B. Barber, of the National Safety Conference, spoke on behalf of Secretary of Commerce, Herbert Hoover in relation to the big meeting in highway-traffic safety to be held in



L. A. DuBlois

Recently elected vice-president in charge of general activities of the National Safety Council. He is safety engineer, E. I. du Pont de Nemours & Co.

Washington in December. H. C. Spillman declared in his address that as man made machines, man power was superior to machine power and should be more carefully conserved. H. Walter Forster discussed the value of the safety engineer and suggested that his ends were best attained by encouraging the foreman to tell what he is doing for safety whether the work he has achieved has been unusual or merely ordinary, the safety engineer more or less casually and inoffensively slipping in an idea that might correct some ill-advised condition and practice. Strickland Gillilian, of Philadelphia, closed the post-prandial entertainment with a half-hour of merriment. The toastmaster was Dr. Charles E. Woodcock, Bishop of the Episcopal Diocese of Kentucky, well-known for his eloquence and wit.

#### NEW STAFF OF OFFICERS DULY ELECTED

Announcements were made of the new officers of the National Safety Council: President, C. B. Auel, safety engineer, Westinghouse Electric & Manufacturing Co.; vice president in charge of public relations, L. R. Palmer, Equitable Life Assurance Society, New York City; vice president in charge of general activities, L. A. DuBlois, safety engineer, E. I. Dupont de Nemours & Co.; vice president in charge of public safety, David Van Schaack, Aetna Life Insurance Co., Hartford, Conn.; vice president of local safety councils, George T. Fonda, Fonda-Tolsted, Inc., New York City; vice president in charge of industrial safety, Henry A. Reninger, Lehigh-Portland Cement Co., Allentown, Pa.; vice president and treasurer, C. B. Scott, Bureau of Safety, Chicago, Ill.; Secretary and managing director, William H. Cameron, Chicago, Ill.





## News Of the Industry



### Co-operative Marketing Seen as Step in Cutting Coal Cost

Advantages Shown in Distribution of Farm Products—Legislation to Be Sought to Extend Benefits to Other Industries—Fear Conflict with Anti-Trust Laws

BY PAUL WOOTON

Washington Correspondent of *Coal Age*

Co-operative marketing among farmers has been so successful that a determined effort will be made at the coming session of Congress to obtain legislation which will accelerate even more this striking development. In 1915 there were 5,400 farmers' co-operative associations with 650,000 members. In that year sales through these organizations aggregated \$635,000,000. During 1923 the sales through farmers' co-operative marketing associations increased to \$2,200,000,000. At the end of 1923 there were 10,160 organizations in the United States, with a total membership of 2,025,600.

The advantages of this form of marketing have been proved beyond all peradventure. The effort is to be made at the next session of Congress to remove some of the obstacles in existing law which are having a hampering effect, and to further encourage this trend. In all probability this legislation will be couched in such form as to extend its benefits to other industries. It will be recalled that Secretary Hoover nearly three years ago proposed co-operative marketing, within districts, for bituminous coal.

The advantages of co-operative marketing, along lines more nearly analogous to coal, are shown in the highly successful British Sulphate of Ammonia Federation. The workings of that organization were studied carefully by Americans who attended the World Power Conference at London.

#### Marketing Beset with Difficulties

Like most byproducts there are unusual difficulties in marketing sulphate of ammonia. Formerly the British coke makers, which in that kingdom means the coal companies, disposed of their sulphate of ammonia independently, at any price which might be available when their stocks reached a point at which they no longer could be carried. It was sold through brokers and exporters. It was found, however, that the exporters were putting their heads together and withholding purchases until they broke the market. These tactics drove the producers into an association in self-defense.

The organization thus formed sells

the entire output of its membership, which comprises 95 per cent of the output of the British Isles.

When a producer delivers his output to the federation he is paid 60 per cent of the price which the association expects to realize from its sale. The remainder is paid to him at the end of the month in which the sale is made. From the total realization is deducted the small expense of marketing and 1s. a ton for extension work. This takes care of advertising expense and of the demonstrators maintained in the field to show farmers how to use fertilizer in that form. Large numbers of these demonstrators now are being sent abroad to explain the use of sulphate of ammonia to farmers in other countries. In fact, more is being spent in this way than all other costs of selling combined.

#### Treat Small Producer Fairly

The federation is an absolutely democratic organization. Every producer has voting representation in proportion to his tonnage. There is representation on a geographical basis and on an industrial basis, since ammonia production is not confined to the manufacture of coke. The oil-shale industry and gas-producing plants are important contributors to the pool. The organization has been extended to the British colonies. Producers in India already belong and those in Canada and Australia are expected soon to join. The federation is so organized that there can be no discriminations against small producers in favor of heavier shippers.

A striking fact in connection with the working out of this plan is that it has proved to be equally advantageous to the consumer. Formerly there were as many different prices for sulphate of ammonia as there were railroad stations in the United Kingdom. The federation immediately established uniform prices. Its product is laid down at any railroad station in the British Isles at the same price. It has extended a great protection to the purchaser of small lots. Sales are made at a circular price announced in advance and guaranteed against change for a period of three months. The

farmer thus can tell what his season's sulphate will cost and he does not have to stop to figure freight rates or worry about changes in the price.

In the same way the federation announces its prices in advance for the export trade. In some countries, to develop its use, a price under the cost of production is made. Thus the costly business of education is carried by the entire industry—an important feature of the business which could not be undertaken by individual producers.

This sort of marketing may conflict with the anti-trust statutes in this country, although the opinion has been expressed that co-operative marketing of coal, so long as it is confined to a single district and so long as competition is maintained between districts, does not violate those laws. At any rate, it would be charged here that such an association would sell at low prices abroad and charge monopoly prices at home. The actual result in Great Britain is exactly the opposite. The average selling price in the British Isles during 1923 was substantially lower than the export price.

The whole scheme has demonstrated the value to all concerned of co-operative marketing. The volume of business handled compares quite favorably with that which would be involved in a similar marketing association among the coal producers of a single district.

There are other examples in Great Britain of successful co-operative marketing enterprises which should be considered by the coal trade in this country in connection with the legislation which will be discussed when Congress meets. The Yorkshire Gas Coal Association maintains standards of preparation which it guarantees. The members advertise jointly through the association.

#### Steam Coal Men Organized

Producers of steam coal in Yorkshire also have an organization known as the South Yorkshire Hard Steam Coal Association. Its production is almost entirely water borne, either in the export or coastwise trade. With the idea of maintaining standards of quality the association gives a certificate to the buyer to the effect that his shipment is the "best South Yorkshire hard steam coal." The organization has an arrangement with the railroads at ports to provide an independent inspection. The railroad examiner also issues a certificate as to quality and as to the mine from which the coal comes. He also certifies as to weight. By this means the producers protect themselves against the irresponsible company which would trade on the general reputation of the district.



## Anthracite Mines Flooded When 8.6 Inches of Rain Falls in Two-Day Storm

*Special to Coal Age*

Scranton, Pa., Oct. 6.—Anthracite mines in the section bounded by Carbondale on the north and Hazleton on the south suffered heavily from the flood which followed the heavy rains throughout the anthracite region last week. The Hudson Coal Co. was the heaviest loser though several other companies also were hard hit. In Wilkes-Barre a flooded creek changed its course and emptied into the mines through a cave-hole in Hollenback Park. Mine cars, bales of hay, timber and steel rails were used in a fruitless effort to form a network over the cave and stop the water from entering the workings. In the meantime all mine workers were ordered from the operation. The situation was similar to the one confronted by the Glen Alden Coal Co. last spring, when the Lackawanna River flooded through a manway and filled several veins, crippling five mines and disabling the million-dollar pump-room located in the Sloan workings, as well as taking a toll of two lives.

After unavailing efforts to check the flow of the water, dikes were constructed and the course of the stream was finally diverted from the workings. The operation will be idle for several weeks until the workings are cleared of water. The underground pumps were submerged and ceased functioning soon after the deluge.

At Larksville the Loree No. 5 colliery of the Hudson company suspended operations on noon of the first day of the rainstorm, when it was found the pumps were not capable of handling the rush of water into the workings.

In the Hazleton region nineteen mines were idle on Monday and eighteen on Tuesday due to excessive water. The loading of cars at the collieries in the lower region was reduced from the normal output of 650 to 136 on Monday and 130 on Tuesday. It was not until the end of the week that the operations began to produce normally.

Water pouring into the mine workings through numerous cave holes caused the Red Ash vein of the Pennsylvania company's No. 7 colliery to become flooded on Tuesday night and threw 350 mine workers idle for three days.

A report from the Lehigh field stated that 8.6 in. of rain fell during the two days' storm. The eighth level of the No. 1 slope in the Hazleton colliery of the Lehigh Valley Coal Co. was flooded, the Crystal Ridge Creek having broken into the mine. The Hazleton Shaft and the Stockton openings likewise were flooded. Production was held up several days.

A substantial cement bridge just finished at the Crystal Ridge road of the Cranberry Creek Coal Co. over a small creek was dynamited by the coal company because it held back flood waters during the storm and caused them to pour into mine openings. The creek became a torrent at the height of the flood. Several sections of the mines were flooded.

## Docks Are Ruthless, Says Federal Trade Commission

The report of the examiner for the Federal Trade Commission, in the charge against the Northwest Coal Dock Operators' Association, is to sustain some of the accusations of unfair methods against that body. He finds it to be guilty of unfair competition against the all-rail trade and that it aimed to drive the latter out of its field, but finds also that price cutting has gone on within its own body and that it has been so ruthless that one dock concern lost \$1,000,000 in a price war.

## Hoover Silent on Status Of Trade Associations

Efforts recently begun by the Chamber of Commerce of the United States to obtain an expression from the Commerce Department as to the legal status of trade associations have proved unavailing thus far, it was admitted by Secretary Hoover last week. He said that he had informed the special committee of the chamber that the interpretation of the Sherman Anti-Trust Act was not a matter for his department and referred it to the Attorney General. Mr. Stone has already indicated an unwillingness to outline a government policy toward trade associations.

Mr. Hoover, however, indicated the belief that there would be some governmental agency, such as the Federal Trade Commission, which would be in a position to help business interests through the clarification of the law. He felt that the establishment of such machinery would be very helpful and quite distinct from any idea of attempting to advise business as to the law and anticipating court decisions.

He described as "a fatal mistake" the failure of Congress to include the suggested functions in the scope of the Federal Trade Commission when that agency was created.

## R. H. Lansburgh Named for Dr. Meeker's Place

Governor Pinchot has appointed Richard H. Lansburgh, of Swarthmore, professor of industry at the University of Pennsylvania, as state Secretary of Labor and Industry, succeeding Dr. Royal Meeker, who has presented his resignation, to take effect Oct. 15. Mr. Lansburgh has for several years been classifying the employment of state workers at the Capitol at Harrisburg and in state institutions. The Governor in announcing the appointment said he is of the opinion that Mr. Lansburgh is the best equipped man in Pennsylvania for the place.

The new head of the department will enter his work with a thorough knowledge of its functions, for he classified and fixed the salaries of its 600 employees. He has few illusions regarding the position.

## West Virginia Miners Quit When Wages Are Cut

Two hundred and seventy miners employed at the Glendale mine of the Glendale Gas Coal Co., at Glendale, W. Va., refused to go to work Oct. 1 after they read a bulletin announcing a contemplated reduction in wages to the scale of 1917. Not an employee entered the mine and the suspension will be indefinite, so far as the officials of the mine can say.

Sheriff John Hazlett, of Marshall County, was warned of the strike and asked to be ready in case trouble starts. It was reported, however, that the strike began in an orderly manner and there was little indication that friction would develop.

The Glendale mine has not been unionized.

Many union miners employed by the Bethlehem Mines Corporation, a subsidiary of the Bethlehem Steel Corporation, at its Barrackville mine, in Marion County, West Virginia, also refused to work when notices were posted stating that on and after Oct. 1 the mine would be operated on an open-shop basis with the 1917 wage scale in effect. Hearing a rumor that a shift would go to work at midnight on Oct. 1, union mine workers patrolled the roads leading to the mine in order to dissuade anyone from going to work. No disturbances were reported, however. The Dakota and Barrackville plants are the only mines of the Bethlehem Mines Corporation in West Virginia which within the last two years have been operated in agreement with the union.

## Jackson Resigns Presidency Of District 23

Lonnie Jackson, for four years president of the miners' union of District No. 23 (western Kentucky), resigned from that office Sept. 30, the resignation to become effective Oct. 1. Jackson gave no reason for his action, but indicated that he was considering entering the real estate business. He will continue to act as Mayor of Central City, he said.

Union miners in the district have been on strike since last April, when coal operators announced a wage cut, which miners declined to accept. Several mines have resumed operations in recent weeks, but they have furnished employment to only a minority of the union workers.

## To Resume in Pomeroy Field

After several conferences between operators and officials of the United Mine Workers in the Pomeroy district of Ohio an agreement has been reached whereby the union has made certain concessions as to dead work and day work which will help in reducing mining costs. The agreement is quite similar to that recently concluded between miners and operators in the Hocking Valley field at Logan. It is expected that as a result of the agreement mines which have been idle for some time will be placed in operation soon, as the demand for domestic sizes is improving.



## Equipment and Labor Useless Without Capable Management, Says Grant

A strong plea for the recognition of management as one of the constituent elements of modern business was the high light of an address by Richard F. Grant, president of the Chamber of Commerce of the United States, before the Philadelphia Chamber of Commerce, Sept. 24.

"In a very large measure," he said, "the great advancement of our country is due to those men who have had the vision and ability to organize and develop our vast resources and to convert them to the uses of our people. Any system which would give the reward of leadership to other than those who by demonstrated ability and work earn it and are entitled to it would be destructive of the principles upon which our development and our greatness are founded."

Mr. Grant, who is also president of the Susquehanna Coal Co., of Cleveland, Ohio, was in Philadelphia on what is termed as a "cross-sectional view of activities of the local Chamber of Commerce." After discoursing at length on the urgency of management, he added that, "public need, the equipment and material which capital provides and available employees will not constitute a business activity. They merely constitute a business opportunity. Unless somebody has the vision to see the opportunity and to organize it and finance

## Here's Another Mule Story

There's a mine superintendent out west who believes some mules actually think. He enters one in the "bright mule contest" now raging in these columns. Says he: "I know a mule which absolutely refused to work underground and which figured out a system of its own to enforce its refusal. When they took him down and put him to work, he always ran away the first time the driver cut him loose from a load. Then he ran to the shaft, cleaned the bottom of men by backing up threateningly at anybody who got in his way, and then jumped into the sump. This always tied up the mine until the whole bottom crew spent an hour hoisting him out. Well, sir, he did that trick every blamed time they tried to work him below. He must have had it figured out that some day they would get tired of his stopping up the whole mine that way. And he won. I tell you that mule thinks."

Next!

it and make it a reality, nothing whatever will happen, even though the opportunity exists. Business opportunities only become business realities when the remaining constituent element of business is present. That remaining constituent element is management."

## Five Companies Merged in \$2,000,000 Concern

A number of coal operators of Birmingham, Ala.; Memphis, Tenn., and Kentucky are principals in the formation of the Great Western Coal Co., a \$2,000,000 company, incorporated under the laws of Delaware. The new corporation is a consolidation of the following concerns: Hawley-McIsaac Co., Inc., Western Coal Co., Gideon Coal Co., Morris Coal Co. (all of which are stripping operations in the western part of Kentucky) and the properties of the Kershaw Coal Co. in Kentucky.

An issue of \$800,000 bonds has been sold to the Atlantic Exchange Bank & Trust Co., of Baltimore, the consolidation and sale of bonds being handled by Charles E. Rice, of the firm of Tillman, Bradley & Baldwin, of Birmingham, Ala.

Among those interested in the company are C. G. Kershaw, T. M. Porterfield, B. R. Smith and J. S. Stone, all of Birmingham; John R. Collins and R. J. Billings, of Memphis; C. R. Hawley and H. M. McIsaac, of Madisonville, Ky.

Operations of this company are located on the Illinois Central R.R. in Hopkins County, Kentucky, and on the Louisville & Nashville in Ohio County, Kentucky. The present output of these mines is on a basis of 900,000 tons annually. Steam shovels of the largest and most modern type are used in mining coal by this company.

## Output and Value of Coal from Kentucky Mines in 1923

(Compiled by U. S. Geological Survey)

County	Loaded at mines for shipment (net tons)	Sold to local trade and used by employees (net tons)	Used at mines for steam and heat (net tons)	Made into coke at mines (net tons)	Total quantity (net tons)	Total value	Average value per ton	Number of employees				Average number of days worked
								Miners, (a)	All others	Surface	Total	
Eastern District												
Bell.....	2,575,670	44,986	38,630	.....	2,659,286	\$6,820,000	\$2.56	2,691	1,362	786	4,839	140
Boyd.....	143,024	5,840	608	.....	149,472	298,000	1.99	187	53	37	277	207
Breathitt.....	196,925	11,515	700	.....	209,140	470,000	2.25	298	129	81	508	131
Carter.....	122,153	25,430	277	.....	147,860	369,000	2.50	182	93	63	338	160
Clay.....	180,583	4,180	300	.....	185,063	330,000	1.79	197	112	65	374	165
Floyd.....	2,968,898	27,459	39,014	.....	3,035,371	7,984,000	2.63	2,475	1,424	860	4,759	137
Harlan.....	8,268,535	55,640	46,756	210,179	8,581,110	23,491,000	2.74	4,951	2,592	1,737	9,280	195
Johnson.....	630,938	10,682	17,691	.....	659,311	2,400,000	3.64	697	289	186	1,172	133
Knott.....	340,389	2,796	.....	.....	343,185	827,000	2.41	132	63	42	237	206
Knox.....	496,854	4,133	9,967	.....	510,954	1,474,000	2.88	631	256	209	1,096	133
Laurel.....	108,039	353	120	.....	108,512	257,000	2.37	225	74	53	352	126
Lawrence.....	11,835	.....	.....	.....	11,835	21,000	1.78	52	24	15	91	48
Lee.....	58,526	.....	486	.....	59,012	138,000	2.34	74	35	21	130	129
Letcher.....	4,263,937	50,931	55,100	.....	4,369,968	12,527,000	2.87	2,573	1,243	807	4,623	167
McCreary.....	862,772	14,587	2,400	.....	879,759	2,246,000	2.55	877	374	164	1,415	142
Martin.....	412,560	590	8,022	.....	421,172	944,000	2.24	200	115	85	400	161
Morgan.....	25,088	4,065	2,933	.....	32,086	148,000	4.61	105	27	63	195	231
Perry.....	4,990,754	27,346	3,933	.....	5,022,033	12,661,000	2.52	3,300	1,576	1,032	5,908	164
Pike.....	5,724,969	69,915	78,614	20,139	5,893,637	15,273,000	2.59	3,474	2,216	1,522	7,212	166
Whitley.....	471,538	10,452	15,687	.....	497,677	1,509,000	2.53	846	303	220	1,369	100
Other counties (b).....	2,310	1,800	.....	.....	4,110	11,000	2.68	10	.....	.....	10	230
Total.....	32,856,297	372,700	321,238	230,318	33,780,553	90,198,000	2.66	24,177	12,360	8,048	44,585	161
Western District												
Christian, Crittenden, and Hancock.....	31,284	1,963	4,376	.....	37,613	\$109,000	\$2.90	181	99	54	334	100
Daviess.....	98,152	20,880	950	.....	119,982	244,000	2.03	99	43	28	170	170
Henderson.....	284,894	68,988	12,240	.....	366,122	866,000	2.37	399	178	77	654	130
Hopkins.....	2,529,690	140,455	46,632	.....	2,716,777	5,437,000	2.00	2,091	871	762	3,724	124
McLean.....	65,011	2,200	729	.....	67,940	134,000	1.97	165	70	66	301	61
Muhlenberg.....	3,728,624	180,051	68,050	.....	3,976,725	8,249,000	2.07	3,580	1,620	670	5,870	125
Ohio.....	943,993	17,216	33,478	.....	994,687	2,065,000	2.08	1,152	410	186	1,748	121
Union.....	1,188,215	30,496	45,302	.....	1,264,013	2,874,000	2.27	904	406	191	1,501	171
Webster.....	1,317,317	9,155	19,948	.....	1,346,420	3,045,000	2.26	1,163	489	272	1,924	120
Total.....	10,187,180	471,394	231,705	.....	10,890,279	23,023,000	2.11	9,734	4,186	2,306	16,226	127
Total all Kentucky.....	43,043,477	844,094	552,943	230,318	44,670,832	113,221,000	2.53	33,911	16,546	10,354	60,811	152
Wagon mines served by rail.....	106,485	.....	.....	.....	106,485	321,000	3.01	.....	.....	.....	.....	.....
Grand Total.....	43,149,962	844,094	552,943	230,318	44,777,317	\$113,542,000	\$2.54	.....	.....	.....	.....	.....

(a) Includes also loaders and shotfirers.

(b) Owsley and Wayne Counties.



166 Miners' Lives Lost in Mine Accidents in August; Eight Months' Total 1,628

Accidents at coal mines in the United States during August, 1924, killed 166 men, according to information received from state mine inspectors by the U. S. Bureau of Mines. The fatality rate for the month, based on an output of 41,851,000 tons of coal, was 3.97 per million tons, about 27 per cent lower than the rate of 5.46 per million tons for August, 1923. The rate for July, 1924, was 3.79. The average rate for August over a ten-year period (1914-23) was 4.17, so that the rate for August of the current year represents a reduction of about 5 per cent. The rate for bituminous mines alone for August, 1924, was 3.77 per million tons, as compared with 5.46 for August last year and 3.89 for the month during the ten years mentioned. For anthracite mines alone the August, 1924, rate was 4.94 per million tons, as against 5.41 for August last year and a ten-year average rate for August of 5.81 per million tons.

Reports for the first eight months of 1924 show that 1,628 men have been killed by accidents at the mines, as compared with 1,793 during the same months last year. The 8-months fatality rate for this year was 4.58 per million tons, as compared with 4.12 in 1923. The increased rate for 1924 was entirely in the bituminous industry and was caused by the explosions of gas and coal dust. The bituminous rate for the first eight months of 1924 was 4.40 per million tons; in 1923 it was 3.83. The anthracite rate for eight months



W. K. Field

President of the Pittsburgh Coal Co., which post he has occupied during the last fourteen years. He has been actively identified with the coal industry for more than thirty years.

in 1924 was 5.48; last year it was 5.63 for the same period.

An analysis of the causes of accidents in 1924 to the end of August, with those for the same period in 1923, shows an increased rate for gas and dust explosions in 1924, but no material change in the rates for other causes of accidents.

Refer Mine Feud in Colorado To Governor Sweet

A row, having the earmarks of a feud, between miners and mine owners near Milner, in Routt County, Colorado, has been referred to Governor Sweet by Walker Glaister, general manager of the Yampa Fuel Co. Mr. Glaister wrote the Governor that his company cannot operate its newly leased Yampa mine, in Curtis Gulch, because a railroad bridge on the spur line running from Milner to the mine was burned some time ago, he thinks by incendiaries who sought to keep the mine from operating. He said threats have been made against the mine in case operations are resumed, but that Sheriff Charles Neiman and the county commissioners do nothing. Sheriff Neiman denied this by telephone to the Governor and said that \$500 was offered for the arrest of those who destroyed the bridge.

Upon investigation Governor Sweet discovered that the mine had been leased previously to several small mining companies, all of which failed to operate it successfully, and all, on abandoning it, failed to make good their obligations to the miners to the extent of \$20,000. The Governor wrote A. J. McGuire, president of District No. 15, United Mine Workers, to take personal charge of the miners for the time being, with the idea of preventing violence. He instructed Sheriff Neiman to maintain law and order. He wrote Mr. Glaister, and W. W. Curtis, of Colorado Springs, owner of the mine, that wages due the miners must be paid.

Coal-Mine Fatalities During August, 1924, by Causes and States

(Compiled by Bureau of Mines and Published by Coal Age)

State	Underground											Shaft				Surface						Total by States				
	Falls of roof (coal, rock, etc.).	Falls of face or pillar coal.	Mine cars and locomotives.	Explosions of gas or coal-dust.	Explosives.	Suffocation from mine gases.	Electricity.	Animals.	Mining machines.	Mine fires (burned, suffocated, etc.).	Other causes.	Total.	Falling down shafts or slopes.	Objects falling down shafts or slopes.	Cage, skip, or bucket.	Other causes.	Total.	Mine cars and mine locomotives.	Electricity.	Machinery.	Boiler explosions or bursting steam pipes.	Railway cars and locomotives.	Other causes.	Total.	1924	1923
Alabama	4		1		2		2					9													9	8
Alaska																									0	0
Arkansas	1			1			1					3													3	0
Colorado	2	1	1	1	1		2					8													8	5
Illinois	5		2				2		2			11													11	16
Indiana			1									1													1	9
Iowa			1									1													1	4
Kansas																									0	0
Kentucky	6		3		1		2					12													12	10
Maryland			1									1													1	0
Michigan																									0	0
Missouri																									0	4
Montana	1											1													1	1
New Mexico			1									1													1	2
North Dakota																									0	0
Ohio	5		1		1							7										1	1	8	10	
Oklahoma											1	1													1	1
Pennsylvania (bituminous)	17		2						1		1	21						1				1	2	23	40	
South Dakota																									0	0
Tennessee							1					1													1	2
Texas																									0	0
Utah		1										1													1	2
Virginia	4		2									6													6	7
Washington		1							1		1	3													3	3
West Virginia	17	2	9	2	1	1	1		2		1	35						1				1	2	37	43	
Wyoming			2	1								3													3	101
Total (bituminous)	62	5	27	5	6	11	6		4	126								2	2		1	2	5	131	267	
Pennsylvania (anthracite)	13	3	1	*4	5					4	30														35	48
Total, August, 1924	75	8	28	9	11	2	11	6	8	156			3	2	1		6	2	2	1		3	2	10	166	
Total, August, 1923	88	11	50	107	14		9	1	2	7	291							5		2		10	18		315	

\*Gas explosions only.



## Moffat Tunnel Through Rockies Well Started, But Who Will Use It?

Real progress has been made in the driving of the Moffat tunnel in Colorado, which is counted on to give Routt County coal a better outlet. The tunnel, which is to be approximately six miles long under James Peak at the Continental Divide, is on the line of the Denver & Salt Lake R.R. (Moffat road), and may be used by that railroad but is being built by the state. Two bores are being driven simultaneously. An 8x8-ft. pioneer or water tunnel has been driven 4,450 ft. from the east portal and 4,150 ft. from the west portal and is thus 26 per cent finished. A total of 378 ft. of crosscuts is completed, or about one-third the total of crosscuts. Headings measuring 7½x9 ft. in advance of the main bore have been driven 4,260 ft. from the east and 2,800 ft. from the west. The railroad tunnel itself, which is to carry a single track, is finished for 1,120 ft. from the east and 480 ft. from the west portal. The loading out of rock from this work is all done by mechanical shovels.

Although the Moffat tunnel has been boomed for years as a possible great aid to the coal industry of Colorado because of the present difficulty of hauling coal out of the rich but little developed fields of Routt County, little enthusiasm over it is felt by Colorado coal men. Of course the bore, if used by the Moffat road, which is the only carrier for the region now, will eliminate more than 20 miles of heavy grades over the crest of the divide. Great difficulty has been experienced by the railroad in keeping this part of its line open in rough weather. Snow and rock slides tie up the road frequently. Also the whole route over the mountains is expensive to maintain. Curves have been so bad that derailments are common. The result has been that the Routt County shippers of coal do not always get enough cars when they need them and coal en route is often long delayed. Some of these troubles no doubt would be eliminated by the use of the tunnel by the Moffat road.

But as a matter of fact nobody knows positively that the Moffat road will lease the bore. No lease has yet been made nor any form of contract signed. There is much talk in Colorado of the possibility of the Denver & Rio Grande Western Ry. leasing or buying the Moffat road, extending it from its present western terminus at Craig, Colo., to a junction with the Salt Lake line

## Woodward Colliery Reopens After Long Layoff

With the resumption of operations at the Woodward colliery of the Glen Alden Coal Co., at Edwardsville, Pa., Oct. 1, more than 1,800 miners returned to work after a layoff of three months made necessary by a series of repairs being made to the mine. The resumption is largely due to the efforts of Rinaldo Cappellini, district president of the miners' union, who called on S. D. Dimmick, vice-president of the company, a day after the return of the latter from a European tour and induced him to consider negotiations for the resumption of operations at the Edwardsville colliery.

Several days elapsed while Mr. Dimmick conferred with the Glen Alden officials, and it was finally decided to open up the colliery and conduct the remaining repairs during the night shifts and on Sundays.

Stanley Williams has been officially appointed check docking boss at the colliery by the local mine union officials, Mr. Williams was elected to that duty by the men last July.

of the Rio Grande somewhere in Utah. This would give the Rio Grande a much shorter route from Denver to Salt Lake City. The financial embarrassments of the Rio Grande have previously made such a purchase unlikely, but the future of the road now looks brighter and a lease of the Moffat road together with the construction of a western link is a possibility.

The Union Pacific also is considered as a possible lessee or purchaser of the Moffat road. If that railroad built a link from its main line in western Wyoming south to connect with the present terminus of the Moffat road it could help develop the northwestern region of Colorado and shorten tremendously its route from Denver to Salt Lake City.

These railroad conjectures keep the nimble wits in the Colorado coal industry busy, but the actual digging of the tunnel and all the possibilities for the use of it have not started any rush of coal interests toward Routt County. In spite of the unquestioned high quality and great extent of the coal of that region and in spite of the probability that some day some good railroad will serve the region, there still remains the obstacle of high freight rates which Routt County coal is always expected to face, tunnel or no tunnel, because of the long mountainous haul. There are now 24 mines in Routt County, nearly half of which are shut down.

## Alberta Operators Not Likely To Reopen This Season

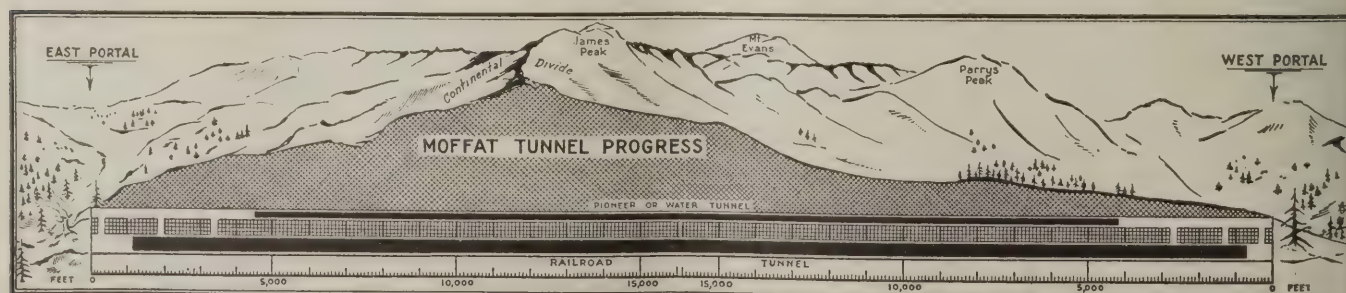
Owing to the Alberta miners' strike American coal is now in general use on the Canadian National Rys. as far as Biggar, Sask., and the prospects are that it will be supplying motive power for the trains even in Alberta before the winter. At present only two mines, at Coal Valley and Stereo, worked by non-union miners, are supplying coal to the Canadian National. The proposal to open some of the closed mines with non-union labor under police protection has been abandoned in favor of another attempt to bring the operators and miners together in a conference, but there is little hope of a settlement.

Operators of northern Alberta, it is stated, are not particularly anxious to reopen the mines, as they have lost the market for the season with little hope of regaining it at present. Alberta coal is at a disadvantage in competing in the Winnipeg and Manitoba markets with the more cheaply mined coal of Pennsylvania and the operators are disposed to continue the struggle to cut production cost. The introduction of natural gas into some of the cities and towns of northern Alberta has somewhat lessened the demand for coal, and the mines still in operation are pushing sales in other localities.

## Backers Want to Build New Indiana-Kentucky Road

Opening of a new coal field in southern Indiana which now is not penetrated by any north-and-south railroad and which contains more than 7,000,000,000 tons of coal will result from the building of the proposed new Owensboro, Rockport & Chicago Ry., between Owensboro, Ky., and Elnora, Ind., by way of a proposed new toll bridge over the Ohio River at Rockport, according to testimony witnesses gave before the Indiana Public Service Commission late in September. The total cost of the road was estimated at \$6,767,016.45. Bonds amounting to more than \$6,000,000 and stocks of \$2,500,000 are to be sold.

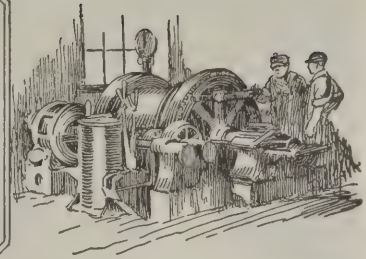
The railroad would be 71.9 miles long in Indiana and 12½ miles long in Kentucky, connecting with the L. & N., L. H. & St. L., and the Illinois Central railroads at Owensboro; the Southern Ry. at Rockport, Velpen and Tennyson; the B. & O. at Montgomery, and the C., M. & St. P. and E. I. & T. H. at Elnora.







## Practical Pointers For Electrical And Mechanical Men



### Tool Saves Time in Trimming Slot Insulation After Motor Is Wound

**A**FTER the coils are all in place in a newly wound armature or stator the protruding slot insulation, usually consisting of a heavy paper, must be trimmed flush with the laminations. The common method of trimming using an ordinary knife is slow, tedious, and hard on the fingers and does not always produce uniform results. With the proper tool this work is almost a pleasure, being accomplished by making successive slices by moving the tool parallel to the slots and holding it so as to slide on the laminations.

The paper-cutting tool shown in Fig. 1 has a slightly turned up point so that it slides easily over any irregularities of the laminations. The offset handle keeps the operators hand clear of the work. It is important that the cutting edge be kept quite

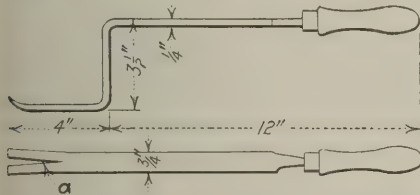


Fig. 1—Used in Hannastown Winding Shop of Keystone Coal & Coke Co.

This tool has an offset handle enabling the operator to cut the insulation for the full length of the slot without bumping his knuckles on the lamination.

sharp to eliminate any tendency to tear rather than cut the insulation. The material, if tool steel, and the cutting end is tempered to about the same hardness as a wood chisel.

#### DON'T BUMP YOUR KNUCKLES

A more simple form of slicing tool is illustrated in Fig. 2. It is constructed from a heavy-power hack saw blade and the handle is formed by a wrapping of ordinary friction tape. This type of tool should be at least six inches longer than the slot, so that the operators hand will not hit the end of the laminations.

In order to keep the cutting edge flush with the bottom side of the blade

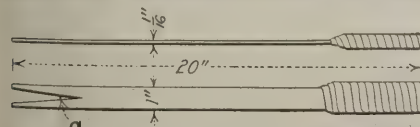


Fig. 2—Used in the Library Winding Shop of the Pittsburg Coal Co.

This tool, having no offset, is made long in order that the handle will not interfere on average length slots.

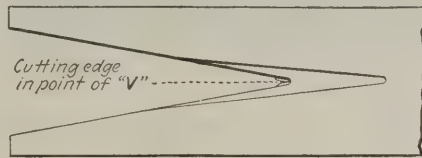


Fig. 3—View of Cutting Groove

The cutting is done in the very apex of the "V" opening which is flush with the bottom surface of the tool.

it must be formed by grinding on one side only, as indicated by Fig. 3. Both forms of the tool are the same in this respect, and in each the actual cutting edge is at the end of the opening between the two prongs shown at *a*.

### Two-Motor Fan Drive Is Good in Emergencies

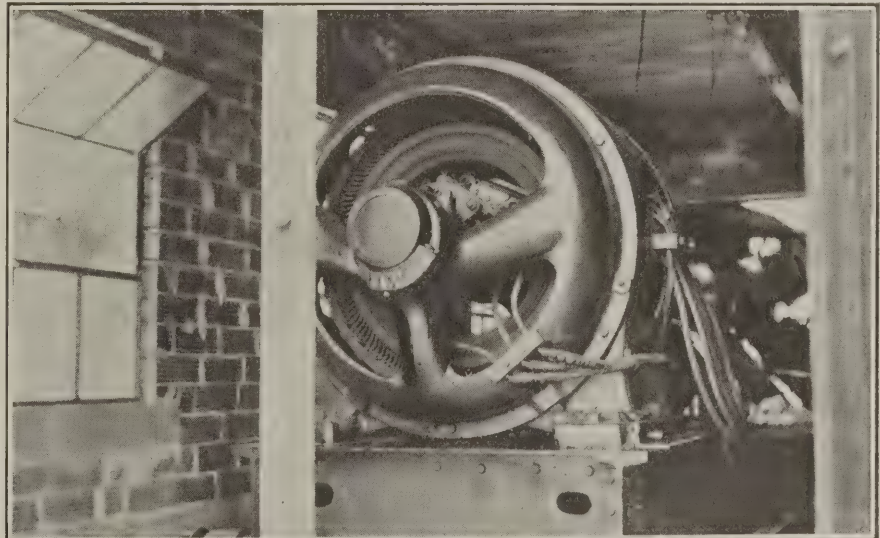
Continuity of service at coal mines is sometimes vital. This is especially true with mine fans. If the fan stops a relatively safe mine may quickly become a den of danger and death.

from the mine shaft, the fan is connected to a two-motor drive. Under ordinary conditions the fan is driven by a large induction motor served from an overhead power line carrying 2,200-volt alternating current. Another motor mounted on a common base plate is a direct-current unit. This motor may be supplied from a direct-current circuit which comes from the main hoisting shaft and also supplies the direct-current energy for the inside workings.

#### OLD MOTOR EARNS ITS KEEP

There are several advantages to this arrangement because practically no extra expense is involved in this duplication of equipment. The direct-current feeder does not stand idle because it supplies the coal-cutting and haulage machines. The direct-current motor is a very old type probably unsuitable for any other purpose around the mines. Consequently, if it were not placed in stand-by service it would have been sold at a loss or would be taking up space in the warehouse, rusted and out of service.

Two flexible couplings connect the two motors to a common belt drive which operates the fan. Normally the coupling on the induction motor is



#### Alternating-Current Motor of Double-Unit Drive

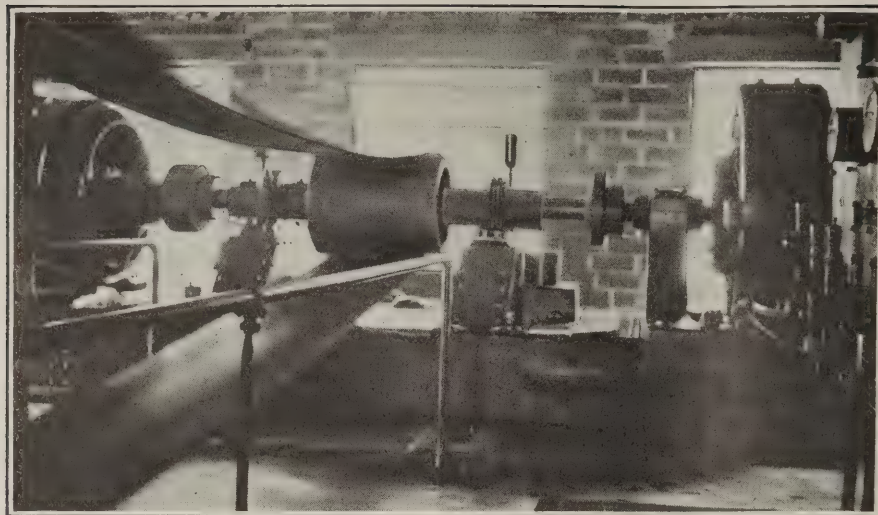
Ample ventilation for the motor winding is provided by setting the motors near windows and doors. This view shows the alternating-current motor which normally drives the fan.

Realizing this, the O'Gara Coal Co., at Harrisburg, Ill., has resorted to various schemes to make sure that mine fans will not stop when the usual supply of power fails to reach the driving motor.

At one fan installation, some distance

connected to the pulley shaft and the coupling on the direct-current motor is disconnected. It takes only a short time to make the coupling between the direct-current motor and the pulley shaft complete because all parts are on hand. Separate control apparatus is





How the Two Motors Are Coupled

A motor on each end of the pulley shaft makes the possibility of a shutdown reasonably remote. The power supply to the induction motor is furnished over an outside transmission line, the power for the direct-current motor is taken from a circuit inside the mines.

provided to start, stop and protect the direct-current motor when it is in operation.

### Keep Pump Impellers in Balance—It Pays

Centrifugal pumps, like alternating-current machinery, are mysterious devices to some men. Whenever anything goes wrong with one of them such workmen just throw up their hands in despair.

Strange as it may seem, a centrifugal pump is one of the simplest pieces of apparatus used in the mines. It is compact and constructed of a few simple parts, only one of which rotates.

J. F. MacWilliams, power engineer of the Pennsylvania Coal & Coke Corp., Cresson, Pa., tells us an interesting experience he had with a pump and writes as follows: "Recently we had considerable trouble with a centrifugal pump. The wearing rings would wear out in about one month. There was no apparent reason why this should happen, so the impeller was brought to the shop for inspection, a spare unit being installed in its place. The dimensions of the impeller checked quite reasonably with the manufacturer's prints, but before the impeller was returned to the mines it was placed on balance ways. This test disclosed the fact that the impeller was  $\frac{1}{2}$  lb. out of balance.

"The impeller was balanced and re-installed, seemingly improving the mining. From this experience it would seem that more attention should be given to the balance of pump impellers. If they are out of balance there is a tendency for them to swing and increase the wear on the wearing rings, and consequently the efficiency of an unbalanced impeller will be low.

"We have decided in the future to check all impellers as they come to the shop, and if found to be unbalanced they are corrected and a record of wear kept to see if the efficiency holds up better.

"It would seem that if it is important to balance other machines which operate at speeds as high as 1,750 r.p.m. it also should be important to balance pump impellers."

### Simple Test-Board for Shop

We see many kinds of test-boards in mine repair shops, varying from the elaborate and expensive factory product to the simple home-made type which in its most abbreviated form consists of nothing more than one or two lamps in

series with test leads connected to the low-voltage lighting or trolley circuit. The test-board pictured here is used by the Keystone Coal & Coke Co., of Greensburg, Pa.

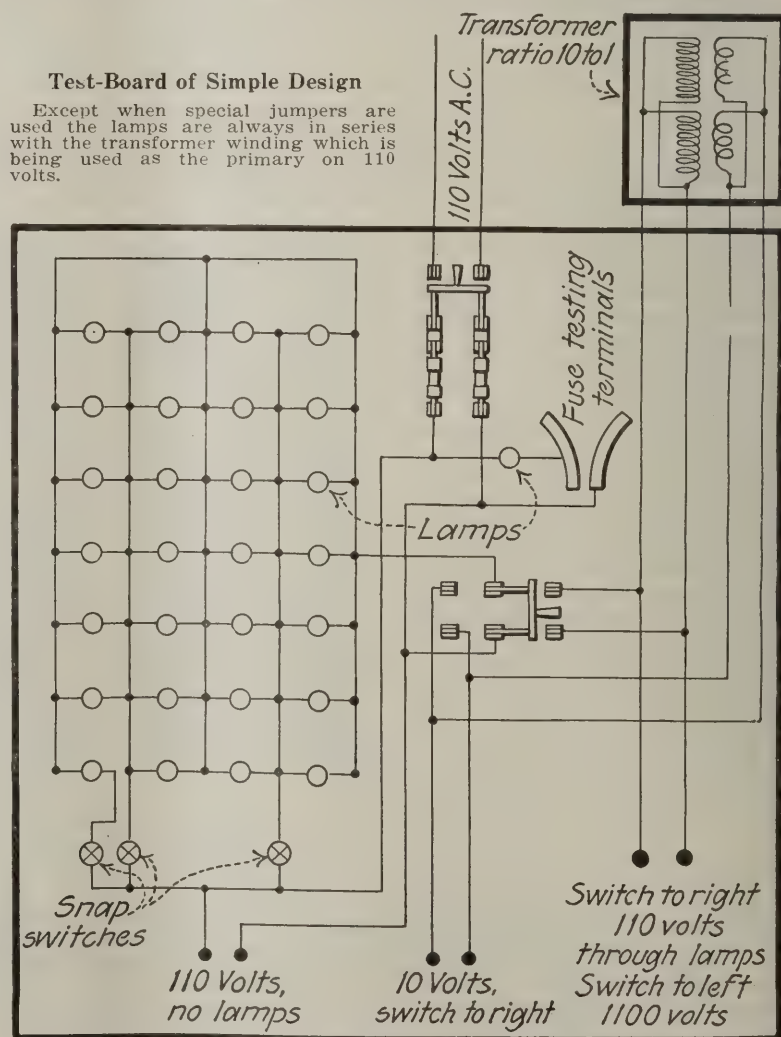
The curved copper strips are proportioned so that any ordinary size fuse is conveniently tested by touching its terminals to the copper strips and noting if the adjacent lamp lights. For other testing purposes leads are connected to any one of the three pairs of terminals seen at the bottom of the board. By manipulating the double-throw switch either 10 volts or 1,100 volts are obtained; in either case, however, the side of the transformer then serving as the primary is in series with one of the desired number of lamps as controlled by the three snap switches. When testing 250-volt direct-current armatures for grounds, with 1,100 volts, it is very desirable to limit the current in case the insulation breaks.

The 10-volt terminals often are used when making a bar-to-bar test on armatures. Low-resistant armature windings required a large current to obtain the desired intensity of sound in the telephone receiver when used in the bar-to-bar test to detect faults.

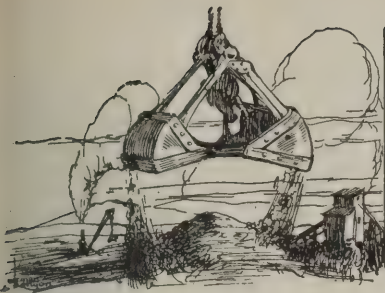
Mr. Demi, chief electrician of the Keystone Coal & Coke Co., states that this company has found this type of board very satisfactory and that several have been installed at the company's various mines.

### Test-Board of Simple Design

Except when special jumpers are used the lamps are always in series with the transformer winding which is being used as the primary on 110 volts.







# Production And the Market



## Bituminous-Coal Market Slowly Forges Ahead; Output and Prices Continue to Climb

The bituminous-coal market continued to forge ahead during the last week. The improvement, of course, is more marked in some fields than others, Baltimore, for instance, still being in the throes of the depression that descended upon the industry last spring. A most encouraging development, however, is the display of strength in the New England market, where pessimism reigned so long. Business is so brisk in western Kentucky that it is difficult to keep track of prices, they change so rapidly. In the other centers, however, the upturn is more gradual. Car supply has become a problem already in fields served by the Chesapeake & Ohio, Norfolk & Western and the Louisville & Nashville as well as in the Birmingham district.

### General Conditions Gradually Improving

While the pace of general industry is irregular the trend is definitely upward and prospects are getting better, particularly in such basic industries as iron and steel as well as textiles. A notable feature of this expansion is seen in the huge orders for equipment being placed by the railroads, \$60,000,000 having been spent for this purpose during the last month by carriers in this country.

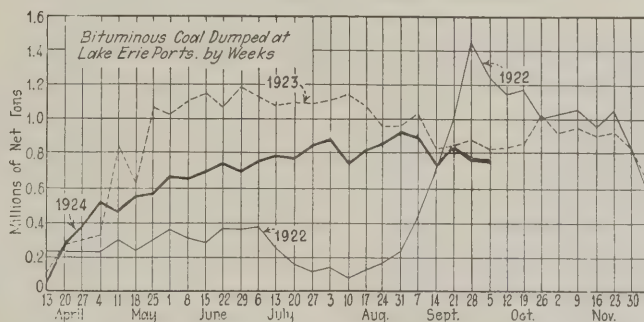
Coal Age Index of spot prices of bituminous coal again advanced one point during the last week—its fifth successive rise—standing on Oct. 6 at 171, the corresponding price for which is \$2.07. This compares with 170 and \$2.06 respectively on Sept. 29.

Activity at Hampton Roads registered a further reaction last week, dumpings of coal for all accounts during the seven-day period ended Oct. 2 totaling 331,398 net tons, compared with 356,557 tons handled during the preceding week.

Coal movement up the lakes is holding up well despite the belief of some that it is a finished job as far as this year is concerned. Dumpings at Lake Erie ports during

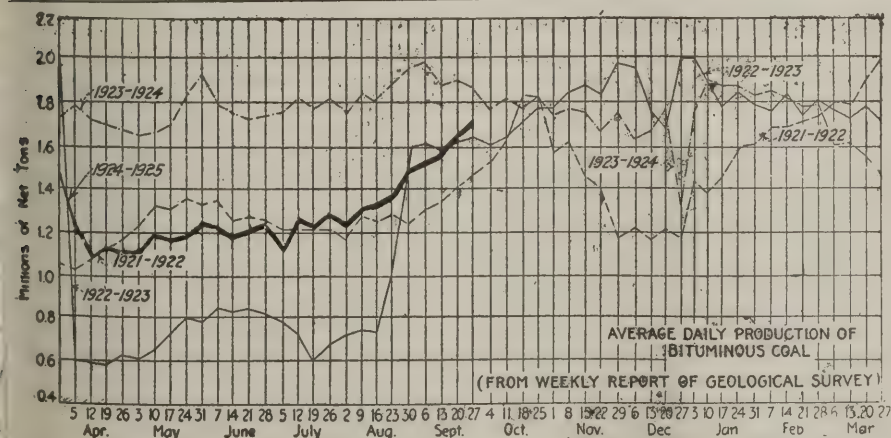
the week ended Oct. 5, according to the Ore & Coal Exchange, were as follows: For cargo, 731,604 net tons; for fuel, 45,145 tons, compared with 734,246 and 39,686 tons respectively during the previous week.

Output of bituminous coal is improving steadily, the total for the week ended Sept. 27, according to the Geological Survey, being estimated at 10,189,000 net tons, an increase of 359,000 tons over the week ended Sept. 20, when 9,830,000 tons was produced, according



to revised figures. The average daily output—nearly 1,700,000 tons—is 193,000 tons less than at this time a year ago, but is slightly higher than at the same time two years ago. Anthracite output also continues to mount, the total for the week ended Sept. 27 being 1,942,000 net tons, compared with 1,851,000 tons during the previous week.

Anthracite is moving easily in most markets, though a large proportion of the business is in small orders, and prices hold firmly. Stove continues to be most in demand, but there is a better call for the other sizes also, including steam coals, No. 1 buckwheat being in particularly good shape. Production has been hampered considerably by floods at a number of mines following the heavy rains of last week.





### Midwest More Than Holds Its Own

Though there has been a lull in orders for domestic coal at Chicago, prices have not weakened, as operators are far behind in deliveries of orders accepted some time ago. All lump prices have stiffened, and this applies also on cheaper grades in the various districts. Egg prices also have stiffened to a uniform level. Dealers who are unable to get shipments on their lump orders are willing to accept 6x3-in. egg. Smaller sizes of all grades, however, are somewhat hard to move. Screenings are plentiful. Nos. 3 and 4 nut are being held on track as "no bills." Some Indiana mines are still running part time, but these are mines that usually depend on steam business.

The western Kentucky situation remains unchanged—oversold on lump, egg in fairly good demand, but smaller sizes going begging. Smokeless coals of West Virginia are readily absorbed, and the prices firm. Anthracite is coming in fairly well and is being absorbed eagerly.

In southern Illinois most mines are oversold for five or six weeks on lump and egg. Nut is beginning to move some but not to any great extent. Screenings are slow and almost impossible to move. Many mines have been idle on account of unbilled steam sizes and there seems no relief for this. The mines are averaging four days a week. Strip mines are working practically every day. Somewhat similar conditions prevail in the Duquoin field, except that

prices range 25c. lower on domestic sizes. Screenings here, as in the Carterville field, are now down to \$1.25. The Mt. Olive field has picked up notably, save that smaller sizes are hard to move in spots, being applied mostly on contract. Prices, however, are unchanged. In the Standard district there is plenty of coal moving but at hardly above production cost. Screenings are as low as 50c. and 2-in. lump is ranging around \$2.50 with 6-in. lump \$2.50@2.75 with a good demand for lump and no call for anything else. Railroad tonnage continues pretty good. Mines are getting three or four days a week.

At St. Louis the demand for domestic sizes continues good on the better grades of lump. Mt. Olive is coming into its own, while Standard is a little bit slow but it is picking up. The weather has been a little bit chilly and this has stimulated the household demand. Local wagon-load steam is showing up well but carload is slow. Mt. Olive and Carterville have advanced 25c. a ton retail. Standard has not moved up yet. Country steam is slow excepting in spots, but domestic is good for both high and low grades.

### Business Heavy in Kentucky

Operating mines in western Kentucky, with a good car supply and good labor supply, are going ahead on a full-time basis and the field as a whole is more active than for

### Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern		Market Quoted	Oct. 8 1923	Sept. 22 1924	Sept. 29 1924	Oct. 6 1924†
Smokeless lump.....	Columbus....		\$6.10	\$4.10	\$4.10	\$4.25@ \$4.50
Smokeless mine run.....	Columbus....		3.05	2.10	2.10	2.10@ 2.35
Smokeless screenings.....	Columbus....		2.25	1.20	1.20	1.15@ 1.30
Smokeless lump.....	Chicago....		6.10	3.85	3.85	3.75@ 4.00
Smokeless mine run.....	Chicago....		2.85	1.90	1.90	1.85@ 2.00
Smokeless lump.....	Cincinnati....		6.10	3.85	4.00	4.00@ 4.25
Smokeless mine run.....	Cincinnati....		2.75	1.85	2.00	2.00@ 2.50
Smokeless screenings.....	Cincinnati....		1.60	1.10	1.20	1.10@ 1.25
*Smokeless mine run.....	Boston....		4.80	4.20	4.25	4.20@ 4.35
Clearfield mine run.....	Boston....		2.15	1.90	1.90	1.45@ 2.35
Cambria mine run.....	Boston....		2.75	2.30	2.35	2.00@ 2.50
Somerset mine run.....	Boston....		2.35	2.05	2.10	1.75@ 2.40
Pool 1 (Navy Standard).....	Philadelphia....		3.10	2.75	2.75	2.50@ 3.00
Pool 1 (Navy Standard).....	Baltimore....		3.20	2.40	2.70	2.50@ 2.90
Pool 1 (Navy Standard).....	Baltimore....			2.60	2.55	2.35@ 2.85
Pool 9 (Super. Low Vol.).....	New York....		2.35	2.10	2.05	2.00@ 2.25
Pool 9 (Super. Low Vol.).....	Philadelphia....		2.55	2.15	2.15	1.95@ 2.35
Pool 9 (Super. Low Vol.).....	Baltimore....		2.40	1.85	1.85	1.80@ 1.90
Pool 10 (H.Gr. Low Vol.).....	New York....		2.05	1.85	1.85	1.80@ 2.00
Pool 10 (H.Gr. Low Vol.).....	Philadelphia....		2.10	1.75	1.75	1.65@ 1.90
Pool 10 (H.Gr. Low Vol.).....	Baltimore....		2.25	1.65	1.65	1.60@ 1.70
Pool 11 (Low Vol.).....	New York....		1.85	1.60	1.60	1.50@ 1.75
Pool 11 (Low Vol.).....	Philadelphia....		1.85	1.45	1.45	1.35@ 1.60
Pool 11 (Low Vol.).....	Baltimore....		2.00	1.55	1.55	1.50@ 1.60
High-Volatile, Eastern		Market Quoted	Oct. 8 1923	Sept. 22 1924	Sept. 29 1924	Oct. 6 1924†
Pool 54-64 (Gas and St.).....	New York....		1.65	1.50	1.50	1.50@ 1.65
Pool 54-64 (Gas and St.).....	Philadelphia....		1.70	1.50	1.50	1.40@ 1.60
Pool 54-64 (Gas and St.).....	Baltimore....		1.60	1.40	1.40	1.35@ 1.50
Pittsburgh bed gas.....	Pittsburgh....		2.55	2.40	2.40	2.30@ 2.50
Pittsburgh gas mine run.....	Pittsburgh....		2.20	2.10	2.10	2.00@ 2.25
Pittsburgh slack (St.).....	Pittsburgh....		1.85	1.85	1.85	1.75@ 2.00
Pittsburgh slack (Gas).....	Pittsburgh....		1.20	1.25	1.15	1.15@ 1.35
Kanawha lump.....	Columbus....		3.15	2.10	2.10	2.00@ 2.25
Kanawha mine run.....	Columbus....		1.85	1.40	1.40	1.30@ 1.55
Kanawha screenings.....	Columbus....		.95	1.05	1.15	.90@ 1.00
W. Va. lump.....	Cincinnati....		3.35	2.35	2.60	2.50@ 2.75
W. Va. gas mine run.....	Cincinnati....		1.35	1.50	1.60	1.40@ 1.65
W. Va. steam mine run.....	Cincinnati....		1.35	1.35	1.45	1.35@ 1.50
W. Va. screenings.....	Cincinnati....		.85	.90	.95	.90@ 1.00
Hooking lump.....	Columbus....		3.10	2.50	2.50	2.40@ 2.65
Hooking mine run.....	Columbus....		1.85	1.55	1.60	1.50@ 1.75
Hooking screenings.....	Columbus....		.95	1.15	1.05	.90@ 1.00
Pitts. No. 8 lump.....	Cleveland....		2.60	2.35	2.35	1.95@ 2.75
Pitts. No. 8 mine run.....	Cleveland....		1.95	1.80	1.85	1.85@ 1.90
Pitts. No. 8 screenings.....	Cleveland....		1.10	1.15	1.15	1.10@ 1.25
Midwest		Market Quoted	Oct. 8 1923	Sept. 22 1924	Sept. 29 1924	Oct. 6 1924†
Franklin, Ill. lump.....	Chicago....		\$4.05	\$3.35	\$3.35	\$3.25@ \$3.50
Franklin, Ill. mine run.....	Chicago....		2.60	2.35	2.35	2.25@ 2.50
Franklin, Ill. screenings.....	Chicago....		1.25	1.35	1.35	1.25@ 1.50
Central, Ill. lump.....	Chicago....		3.10	2.85	2.85	2.75@ 3.00
Central, Ill. mine run.....	Chicago....		2.10	2.20	2.20	2.15@ 2.25
Central, Ill. screenings.....	Chicago....		.70	1.15	1.15	1.10@ 1.25
Ind. 4th Vein lump.....	Chicago....		3.35	3.10	3.10	3.00@ 3.25
Ind. 4th Vein mine run.....	Chicago....		2.60	2.35	2.35	2.25@ 2.50
Ind. 4th Vein screenings.....	Chicago....		1.20	1.35	1.35	1.25@ 1.50
Ind. 5th Vein lump.....	Chicago....		2.50	2.60	2.60	2.75@ 3.00
Ind. 5th Vein mine run.....	Chicago....		2.10	2.10	2.10	2.00@ 2.25
Ind. 5th Vein screenings.....	Chicago....		.80	1.25	1.25	1.20@ 1.35
Mt. Olive lump.....	St. Louis....		3.10	3.00	2.85	2.75@ 3.00
Mt. Olive mine run.....	St. Louis....		2.25	2.50	2.50	2.50
Mt. Olive screenings.....	St. Louis....		1.25	1.25	1.25	1.25
Standard lump.....	St. Louis....		3.00	2.75	2.85	2.75@ 3.00
Standard mine run.....	St. Louis....		2.05	1.80	1.80	1.75@ 1.85
Standard screenings.....	St. Louis....		.55	.95	.80	.75@ .90
West Ky. lump.....	Louisville....		2.55	2.85	2.85	3.25@ 3.50
West Ky. mine run.....	Louisville....		1.75	1.65	1.65	1.50@ 1.90
West Ky. screenings.....	Louisville....		.55	1.00	.90	.75@ .80
West Ky. lump.....	Chicago....		2.60	2.70	2.85	2.75@ 3.00
West Ky. mine run.....	Chicago....		1.75	1.65	1.65	1.35@ 1.95
South and Southwest		Market Quoted	Oct. 8 1923	Sept. 22 1924	Sept. 29 1924	Oct. 6 1924†
Big Seam lump.....	Birmingham....		3.75	3.10	2.85	2.75@ 3.25
Big Seam mine run.....	Birmingham....		1.95	1.60	1.60	1.50@ 1.75
Big Seam (washed).....	Birmingham....		2.35	1.85	2.00	1.75@ 2.00
S. E. Ky. lump.....	Chicago....		3.35	2.85	2.85	3.00@ 3.25
S. E. Ky. mine run.....	Chicago....		2.25	1.60	1.60	1.50@ 1.75
S. E. Ky. lump.....	Louisville....		3.25	3.00	3.00	2.75@ 3.50
S. E. Ky. mine run.....	Louisville....		2.00	1.55	1.55	1.35@ 1.90
S. E. Ky. screenings.....	Louisville....		.85	.90	.90	.85@ 1.00
S. E. Ky. lump.....	Cincinnati....		3.25	2.60	2.75	2.50@ 3.00
S. E. Ky. mine run.....	Cincinnati....		1.35	1.50	1.55	1.35@ 1.75
S. E. Ky. screenings.....	Cincinnati....		.85	1.00	1.00	.90@ 1.10
Kansas lump.....	Kansas City....		5.00	4.50	4.50	5.00
Kansas mine run.....	Kansas City....		3.50	3.25	3.25	3.25
Kansas screenings.....	Kansas City....		2.25	2.35	2.35	2.35

\* Gross tons, f.o.b. vessel, Hampton Roads.

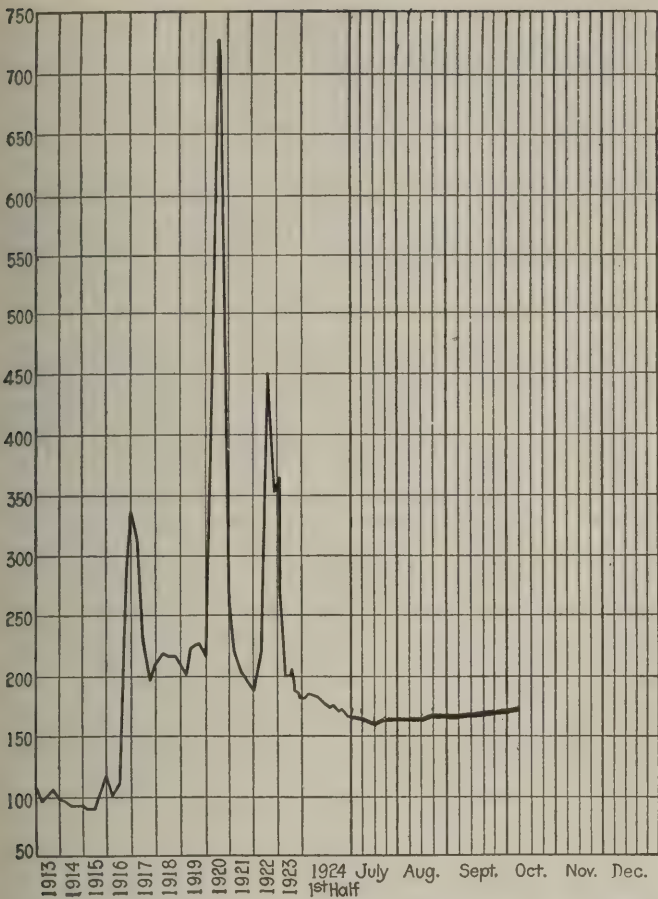
† Advances over previous week shown in heavy type, declines in italics.

### Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

		Market Quoted	Freight Rates	Oct. 8, 1923		Sept. 29, 1924		Oct. 6, 1924†	
				Independent	Company	Independent	Company	Independent	Company
Broken.....	New York....	\$2.34		\$9.60@ \$12.25	\$8.00@ \$9.25	\$8.00@ \$9.25	\$8.00@ \$9.25		\$8.00@ \$9.25
Broken.....	Philadelphia....	2.39				9.15			9.15
Egg.....	New York....	2.34		9.85@ 12.25	8.75@ 9.25	\$9.25@ \$9.75	8.75@ 9.25	\$9.25@ \$9.75	8.75@ 9.25
Egg.....	Philadelphia....	2.39		9.85@ 12.20	8.75@ 9.25	9.00@ 9.70	8.80@ 9.25	9.00@ 9.70	8.80@ 9.25
Egg.....	Chicago....	5.06		9.60@ 12.50	8.00@ 8.35	8.17@ 8.27	8.14@ 8.20	8.17@ 8.27	8.14@ 8.20
Stove.....	New York....	2.34		9.85@ 12.25	8.75@ 9.25	9.50@ 10.25	8.75@ 9.50	9.50@ 10.25	8.75@ 9.50
Stove.....	Philadelphia....	2.39		9.85@ 12.20	8.90@ 9.25	9.35@ 10.00	9.15@ 9.50	9.35@ 10.00	9.15@ 9.50
Stove.....	Chicago....	5.06		9.60@ 12.50	8.00@ 8.35	8.63@ 8.75	8.50@ 8.64	8.63@ 8.75	8.50@ 8.64
Chestnut.....	New York....	2.34		9.85@ 12.25	8.75@ 9.25	9.25@ 9.75	8.75@ 9.25	9.25@ 9.75	8.75@ 9.25
Chestnut.....	Philadelphia....	2.39		9.85@ 12.20	8.90@ 9.25	8.85@ 9.80	9.15@ 9.25	8.85@ 9.80	9.15@ 9.25
Chestnut.....	Chicago....	5.06		9.60@ 12.50	8.00@ 8.35	8.26@ 8.40	8.44@ 8.60	8.26@ 8.40	8.44@ 8.60
Pea.....	New York....	2.22		6.75@ 8.00	6.15@ 6.65	5.25@ 5.75	5.50@ 6.00	6.00@ 5.50	5.50@ 6.00
Pea.....	Philadelphia....	2.14		6.75@ 9.00	6.35@ 6.60	5.75@ 6.25	5.75@ 6.00	5.75@ 6.25	5.75@ 6.00
Pea.....	Chicago....	4.79		6.00@ 6.75	5.40@ 6.05	5.13@ 5.45	5.36@ 6.20	5.13@ 5.45	5.36@ 6.20
Buckwheat No. 1.....	New York....	2.22		2.50@ 3.50	3.50	2.50@ 3.00	3.00@ 3.15	2.25@ 3.00	3.00@ 3.15
Buckwheat No. 1.....	Philadelphia....	2.14		3.00@ 3.50	3.50	2.50@ 3.00	3.00	2.50@ 3.00	3.00
Rice.....	New York....	2.22		2.00@ 2.50	2.50	1.75@ 2.25	2.00@ 2.25	1.85@ 2.25	2.00@ 2.25
Rice.....	Philadelphia....	2.14		2.00@ 2.50	2.50	2.00@ 2.25	2.25	2.00@ 2.25	2.25
Barley.....	New York....	2.22		1.15@ 1.50	1.50	1.25@ 1.50	1.50	1.25@ 1.50	1.50
Barley.....	Philadelphia....	2.14		1.50	1.50	1.50	1.50	1.50	1.50
Birdseye.....	New York....	2.22			1.60		1.60	1.35@ 1.60	1.60

\* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.





Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

	1924			1923
	Oct. 6	Sept. 29	Sept. 22	Oct. 8
Index	171	170	169	190
Weighted average price	\$2.07	\$2.06	\$2.04	\$2.30

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke; 1913-1918," published by the Geological Survey and the War Industries Board.

a long time past. Prices are changing rapidly, and mostly for the better, except for screenings, which are lower.

Peak prices in both the eastern and western Kentucky fields are at around \$3.50 for best block sizes. West Kentucky is quoting 75c. on screenings and east Kentucky 85c. as a minimum, but shading these prices 10c. at times to move surplus. Mine run is quoted at around \$1.35@\$1.90 in both sections, although west Kentucky isn't quoting much at under \$1.50.

Louisville retailers are meeting with a big demand for coal, and are taking a lot of fuel not only to take care of immediate deliveries but for yard stocking. This condition is also true in the rural districts, and in states to the north.

Northwest Markets Ease Along

Trade in the Northwest moves along quietly with only a fair industrial demand here and in Duluth. The Steel Corporation is bringing up plenty of coal, however, and this points to a winter of mining, which will help the docks some. Trade in the Dakotas is brisk. Pocahontas lump took a 50c. jump at the Head of the Lakes this week, bringing the dock price to \$7.50. Other bituminous prices are the same. Thirty-five cargoes, of which seven were hard coal, arrived at Duluth last week. Eleven are reported on the way, of which three are hard coal. Railroad congestion is feared, as incoming grain is already tied up.

Twin Cities consumers continue to buy coal only when they are forced to do so, but nevertheless strengthening prices have been the rule in the all-rail coals. Southern Illinois lump is firm at \$3.25; central Illinois lump, \$2.75; Indiana lump, \$3@\$3.25; western Kentucky lump, \$2.75@\$3. Dock coal prices continue to be at list, and increased prices

are suggested as likely, though the competition of all-rail coal works to hold it back. There has been something of a shift in the demand for all-rail coal, due to the 28c. increase from southern Illinois and the deferring of the increase from northern and central Illinois and from Indiana. Some of the product from Indiana and from central and northern Illinois will get into this district as against the higher cost on southern Illinois. The dock trade is working hard to gain business under the new conditions.

Coal is moving better at Milwaukee, but even so it is not brisk. Consumers are holding back, seemingly because of a lack of funds with which to put in the usual winter supplies. This is noted throughout Wisconsin and the Northwest. Dealers expect a rush when real cold weather sets in, with consequent difficulty in filling orders. The higher grades are hard to get just now, as the mines are sold up to capacity for at least six weeks. This is especially true of the Kentucky mines. Coal is coming in freely by lake. During September the receipts at Milwaukee were 397,231 tons, of which 75,431 tons were anthracite and 321,800 tons were bituminous.

Western Centers Show Vim

Heavy demand for Kansas lump has caused an advance of 50c., to \$5 a ton, on that grade. Other grades remain unchanged. Some operators are behind on deliveries of lump, but there is a slowly mounting surplus of screenings. There likewise is a strong demand for Arkansas lump. The demand for Arkansas screenings is so light that some shippers are quoting them as low as \$1.25. The circular price remains at \$2, with Arkansas semi-anthracite lump \$5.50@\$7, and mine run \$3@\$3.50. Henryetta (Okla.) lump is quoted at \$5; nut at \$4; mine run at \$3.25 and screenings at \$1.75.

Demand for domestic sizes has improved in Colorado but not to such an extent as expected, considering the small amount of coal having been taken into stock during the summer months. Working time at the mines last week averaged twenty-nine hours with only 27 per cent of the working time lost attributed to "no market." Prices remain unchanged and the present supply of labor is sufficient.

In Utah the industrial demand is light, about the only concerns buying coal being the mining and smelting companies. The domestic demand is normal for the season. Nut coal is moving slowly compared with the other sizes. Heating plants are taking slack. The car and labor situations are satisfactory, and wholesale prices remain firm. Retail prices are still unsettled with the tendency upward. Utah mines are operating around three days a week.

Ohio Markets Hold Gains

The Cincinnati market is holding up well, partly because of extra orders from northeastern Indiana, eastern and central Michigan. Lake buyers have been active, insisting on contract shipments being hurried, and some have entered the slack market, for which a drop was expected, but with these takers it has not been forced below 90c. and has ranged up to \$1.10 for good gas offerings. The principal cause for note in the high-volatile fields is a diminution of equipment, allotment being necessary on some roads. In the smokeless market there has been a vast improvement, some firms reporting full bookings for the month. Slack is still going begging at \$1.15@\$1.25 a ton.

Domestic demand has expanded at Columbus to such an extent that prices have advanced from 25 to 75c. per ton in many cases. Splints and Kentucky grades have advanced and the strength has extended to smokeless varieties. Dealers in Indiana and Michigan are coming into the market, which complicates the situation. Steam business is still dull and featureless. Buying is restricted to immediate wants and the larger users are content to buy on the open market to a large extent. Contracting has not been stimulated by the better domestic demand and screenings are exceedingly weak, owing to the larger production.

Demand for prepared sizes for domestic use is stronger at Cleveland now than at any time this year, and particularly is this true of smokeless fuels from fields to the south, the f.o.b. mine prices on all of which have advanced somewhat during the past two weeks. Steam coal also is in more consistent demand. Output in the eastern Ohio No. 8 field is now larger than at any time since February. There have been some temporary car shortages in eastern Ohio.



### Gradual Gain at Pittsburgh

Demand at Pittsburgh shows a slight further increase. The district is now working at about 50 per cent against scarcely 20 per cent in June. Industrial and railroad consumption has increased somewhat and the domestic trade has developed, though it is hardly up to normal for the time of year. Steam slack continues weak, but gas slack has stiffened, with heavier demand for the better grades, and is quotable at \$1.15@1.35 according to quality against \$1.10@1.20 a week ago. Otherwise prices are unchanged.

Further slight gains are being made in the central Pennsylvania field. Loadings for the week ending Sept. 27 were 13,998 cars, against 13,860 the week previous.

Trade is exceedingly dull at Buffalo. Resumption of operations in various mines which have been able to make lower wage agreements with their miners has added to the output and hurt an already overloaded market. In consequence slack has lost all its recent advance.

With the approach of winter the Toronto market is gradually improving. Householders are laying in supplies and a slight improvement in the industrial situation has resulted in an increased demand for soft coal. Both soft and hard coal are coming in in plentiful quantities, and there is no possibility of a shortage of either for a long while to come.

### New England Market Gains in Strength

Further appreciation has occurred in prices in the tidewater bituminous situation at Boston. For standard grade New River and Pocahontas \$5.35 gross ton on cars is as low as has been named the past week which compares with \$5.25 a week ago and \$5.15 a fortnight previous. Some shippers have not been open to orders at \$5.35, demanding at least \$5.40 and quite a fair tonnage has been booked. Some small lot business has been taken at \$5.45 and at least one sale is noted at \$5.50. The advance in spot f.o.b. prices at the Southern piers is principally responsible for this increase.

Rather too plentiful receipts at Providence the past week have prevented any advance in prices but the level has been well maintained at \$5.35@5.40 gross ton on cars for standard grade coal.

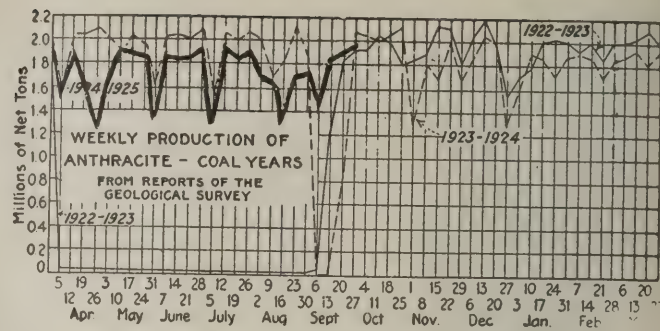
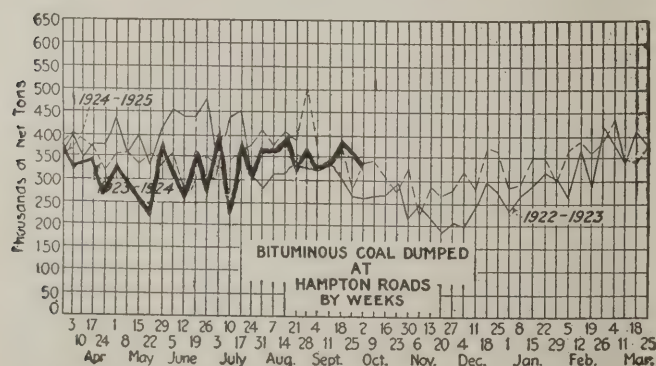
One or two shippers have managed to pick up some more orders on Pennsylvania steam coal the past week, but generally speaking, the all-rail phase of the market remains very quiet. Prices remain about the same, the range for business in New England being \$2@2.50 net ton, mines.

A noticeable feature in the market has been a further increase in the demand for coke, particularly heating coke, and fair sales of Connellsville crushed and sized are noted at \$9.25@9.75 net ton delivered.

### Quality Coals Move Well in Atlantic Markets

For the first time since early summer some of the railroads are taking full coal requirements in the New York market. This together with a better demand from along the line has stiffened the market, prices, however, remaining steady. Many producers of high-class coals are sold up for some time to come. The cheaper coals are not moving as easily. The tidewater situation is in better shape. With demand stronger along the line shippers are not sending heavy shipments to tidewater, finding they can obtain better prices from inland dealers.

Slight improvement continues at Philadelphia. Inquiries are fairly numerous and the tonnage reaching this market is slowly increasing. Prices do not move upward, however, save in isolated instances. Most buying continues to be



centered on coal of Pool 9 grades, as the consumer for the most part wants a good article when he does buy. In the gas-coal market there is freer production of slack, which is in good demand by cement plants. The B. & O. car shortage seems to have passed. The tide market is unchanged.

The flat condition of the Baltimore market is a disappointment to coal men who had expected a boost in trading with the appearance of autumn. Industrial demand is light, as general business is at comparatively low ebb. While the export situation is behind other years, foreign shipments increased in September over the previous month.

Some cool weather at Birmingham boosted domestic trade decidedly, inquiry gaining strength and a substantial tonnage being booked for points throughout the territory. Medium grades are in better demand. The steam market also has improved. Quotations on steam coal are firm with some advance in domestic grades for October delivery. There has been some improvement in the working schedule of the larger commercial and domestic mines. Gondolas have been in short supply.

### Anthracite Moving Easily

Anthracite is moving freely at New York. Stove continues to be the most wanted size with egg much easier. Chestnut is plentiful but is far from being a drug on the market. Prices hold firm. Dealers are dependent to a considerable extent upon small orders but are well supplied to take care of any rush that may come. Pea is moving slowly. No. 1 buckwheat is in good shape, the better grades bringing close to \$3. Rice and barley are in fair demand.

The Philadelphia anthracite trade has been greatly unsettled by the heavy rains and floods throughout the entire region, which checked the industry almost in its entirety for several days. The retail trade continues fair but has not progressed as well as expected. The state of the retail trade is reflected in the varying prices offered. Buckwheat is improving, but rice and barley are quite slow.

Demand for anthracite at Baltimore is only moderate. There are fair stocks in yards, but as many homes have empty cellars the next few weeks probably will see much more active conditions. Several boats have just been chartered to bring British anthracite to this city.

In the Boston market the demand for straight stove is such that \$10 50 gross ton mines is readily paid, but egg is not wanted and consequently is quoted at \$8.75. The steam sizes also have slowed up and No. 1 buckwheat is offered at \$2.25 without results.

Anthracite is moving better at Buffalo. The quantity in consumers' cellars is less than usual, but it is difficult to get them to buy. Some large consumers are trying smokeless coal and practically everybody is using natural gas.

The Connellsville coke market presents a slightly weaker tone, though there is no quotable decline in prices. It appears that while in August production and consumption were closely balanced, some operators obtaining additional business since then have blown in more ovens than needed merely to take care of the additional business, so that there may be some surpluses to work off.

### Car Loadings, Surpluses and Shortages

	Cars Loaded—	
	All Cars	Coal Cars
Week ended Sep. 20, 1924.....	1,076,553	188,985
Previous week.....	1,061,424	183,315
Week ended Sept. 22, 1923.....	1,061,424	182,591

	Surplus Cars		Car Shortage	
Sept. 22, 1924.....	143,345	72,279		
Sept. 14, 1924.....	167,157	84,197		
Sept. 22, 1923.....	59,008	16,840	13,515	5,482



Foreign Market

And Export News

British Coal Market Weakens in Face of

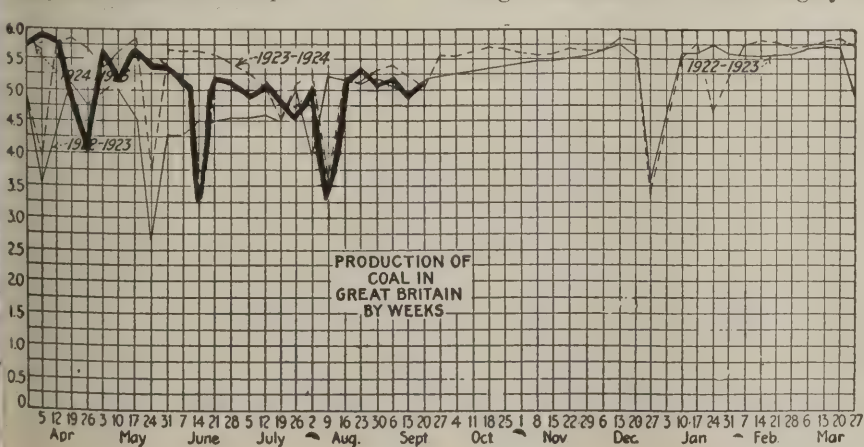
Keen European Competition

All sections of the Welsh coal market are in a very weak condition, business is diminishing and conditions generally seem to have gone from bad to worse. It has been decided to close down more pits, and a large proportion of the remaining collieries are working not more than three or four days per week. In some cases, notably at the Mardy Pit, Rhymney, the miners have agreed to revised operating conditions, and a threatened shutdown has been averted. In many instances the miners are co-operating with the owners in their endeavors to maintain the pits in operation, a case in point being the Big Pit, Blaenavon, where the miners have agreed to double shifts and other conditions. Competition is being felt keenly, and the operators everywhere are inclining to the view that revised conditions for the industry are necessary, either in the form of double shifts or the extension of the working day from seven to eight hours.

The general demand is somewhat restricted; business with France is slow and orders from Italy are only a fraction of normal. South American business is practically stagnant. There is a fair request for the best classes of dry steam coals owing to the scarcity of anthracite, but other descriptions are overstocked and irregular.

The Newcastle market seems steadier, particularly in steam coals. Prompt business is slow and export inquiry is so low as to be negligible. Twenty pits are idle in Durham and there are 6,000 miners out of work; in the majority of cases the pits are operating not more than three shifts per week.

Output by British collieries during the week ended Sept. 20, a cable to *Coal Age* states, was 5,135,000 tons, according to the official reports. This compares with 4,907,000 tons produced during the week ended Sept 13.



Lull in French Coal Market

Extends to Domestic Fuel

The French coal market is stationary. Output is steadily mounting in the Nord and Pas-de-Calais, the average deficiency in daily production when compared with 1913 now being only 7,000 tons.

The demand for industrial coals is quiet, but stocks are not heavy. Competition of British prices is not keen as yet.

Deliveries of house coals are somewhat lower. The prices for October have been officially established at the same levels as for September, with the exception of ovoids, which have been reduced to 117.20 fr. net. Belgian prices for export to France also are unchanged, ovoids alone being reduced to 107 French francs net.

Imports from South Wales are normal again.

German tenders of coal on the free market continue large, but deliveries still fail to keep pace with the offers.

Rail traffic has improved on the northern lines, but on the State Railway system at Rouen the situation is still bad, as only 50 to 60 per cent of the requirements are covered, and very often the product cannot be used because of deterioration. Canal freight remains at 22 fr. Béthune-Paris.

Firm Tone at Hampton Roads;

Outlook Brighter

Business at Hampton Roads shows little change from last week, being fair in all sections, with coastwise and bunker trade responsible for the bulk of the business. The market remains at about the same point and prospects continue to brighten.

Accumulations at the piers are not so heavy and movement from the mines has decreased to some extent. Foreign business is confined largely to

Italy and Brazil, with scattered shipments elsewhere.

The tone of the market is strong. Domestic business is improving rapidly, with anthracite strengthening, quoted at \$15 delivered, an increase of 50c. The best Pocahontas coal is quoted delivered at \$10.

U. S. Fuel Imports During August

(In Gross Tons)		1923	1924
Anthracite.....		588	437
Bituminous.....		58,344	27,216
Imported from:			
Canada.....		58,344	21,146
Australia.....			6,040
Other countries.....			30
Coke.....		3,162	5,852

Export Clearances, Week Ended

Sept. 27, 1924.

FROM HAMPTON ROADS

	Tons
For Brazil:	
Br. Str. Eastmoor for Rio de Janeiro.	7,615
Du. Str. Ootmarsum for Santos.....	5,717
Dr. Str. Stephen for Para.....	2,792
For Canada:	
Br. Str. Dunslaw for Three Rivers...	5,379
Nor. Str. Fragner for Three Rivers..	7,930
For Canal Zone:	
Amer. Str. Ulysses for Christobal....	11,674
For Cuba:	
Nor. Str. Besseggen for Havana....	3,493
For France:	
Ital. Str. Emanuele Accame for Mar-seilles.....	11,436
For Italy:	
Amer. Str. Algic for Porto Ferrajo.	3,534
Ital. Str. Golden Gate for Genoa....	3,524
For Malta:	
Ital. Str. Laura .....	2,025
For Porto Rico:	
Amer. Schr. Friendship for San Juan.	1,006
For West Indies:	
Dan. Str. Silkeberg for Port of Spain	2,596
Nor. Str. John Bakke for St. Pierre..	2,612

FROM PHILADELPHIA

For Canada:	
Amer. Schr. Dorothy for St. John,	
N. B. ....	

Hampton Roads Pier Situation

N. & W. Piers, Lamberts Pt.: Sept. 25		Oct. 2
Cars on hand.....	1,249	1,505
Tons on hand.....	87,589	98,085
Tons dumped for week.....	100,419	99,331
Tonnage waiting.....	12,000	10,000
Virginian piers, Sewalls Pt.:		
Cars on hand.....	1,271	1,347
Tons on hand.....	87,150	93,650
Tons dumped for week.....	119,855	81,410
Tonnage waiting.....	2,900	7,315
C. & O. Piers, Newport News:		
Cars on hand.....	1,998	1,132
Tons on hand.....	104,210	57,265
Tons dumped for week.....	97,188	115,151
Tonnage waiting.....	4,640	350

Pier and Bunker Prices, Gross Tons

PIERS

	Sept. 27	Oct. 4†
Pool 9, New York....	\$4.75 @ \$5.05	\$4.75 @ \$5.05
Pool 10, New York....	4.60 @ 4.75	4.60 @ 4.75
Pool 11, New York....	4.35 @ 4.60	4.35 @ 4.50
Pool 9, Philadelphia..	4.90 @ 5.25	4.90 @ 5.25
Pool 10, Philadelphia..	4.45 @ 4.70	4.45 @ 4.70
Pool 11, Philadelphia..	4.30 @ 4.50	4.30 @ 4.50
Pool 1, Hamp. Roads.	4.25	4.15
Pool 2, Hamp. Roads.	4.00	4.05
Pools 5-6-7 Hamp. Rds.	3.90 @ 4.00	3.90

BUNKERS

Pool 9, New York....	\$5.00 @ \$5.30	\$5.00 @ \$5.30
Pool 10, New York....	4.85 @ 5.00	4.85 @ 5.00
Pool 11, New York....	4.60 @ 4.85	4.60 @ 4.75
Pool 9, Philadelphia..	4.90 @ 5.25	4.90 @ 5.25
Pool 10, Philadelphia..	4.75 @ 4.95	4.75 @ 4.95
Pool 11, Philadelphia..	4.50 @ 4.70	4.50 @ 4.70
Pool 1, Hamp. Roads.	4.25	4.25
Pool 2, Hamp. Roads.	4.00	4.15
Pools 5-6-7 Hamp. Rds.	4.00 @ 4.15	4.00

Current Quotations British Coal f.o.b.

Port, Gross Tons

Quotations by Cable to *Coal Age*

	Sept. 27	Oct. 4†
Cardiff:		
Admiralty, large.....	27s.6d.	27s.
Steam smalls.....	15s.3d.	14s.6d. @ 15s.
Newcastle:		
Best steams.....	19s.	23s. @ 24s.
Best gas.....	22s.	21s. @ 22s.
Best bunkers.....	18s.6d.	18s.6d. @ 19s.

†Advances over previous week shown in heavy type, declines in italics.





## News Items From Field and Trade



### COLORADO

J. A. Halbert has purchased the coal mine of the Joerger Fuel Co., at Trinidad, and plans to make extensive improvements.

During the month of August a total of 701,359 tons of coal was mined in Colorado compared with 750,221 tons mined in August, 1923, bringing the total production for the first eight months of this year up to 6,285,781 tons compared with 6,479,351 tons mined during the same period last year. So far this year the number of days worked per mine in the state is 111.2. The total decrease in the production of coal during the first eight months of this year as compared with the corresponding period in 1923 has been 193,570 tons. During August 10,768 men were employed at the mines.

### ILLINOIS

W. H. Riester has been appointed general sales agent for Donk Bros. Coal & Coke Co. at St. Louis, Mo., effective Sept. 23. Twenty-five years ago on July 1 he entered this company's employ as weigh master in one of its retail yards.

H. Clarence Bean, of the Sterling-Midland Coal Co., has been transferred from Duquoin, where he was connected with the operation of the Jewel Coal & Mining Co., of that place, to Evansville, Ind., where he will be connected with the company's affairs.

The Valley View mine near Rock Island, owned by Sackville & Wynn, opened the middle of September with about 35 employees after having been down since last February.

P. H. Greenlaw, formerly in charge of statistics for the Fifth and Ninth Districts Operators' Association in Illinois, is now with the Southern Coal, Coke & Mining Co., of St. Louis, handling problems of public and employee relations. He gets out an employees' magazine which will be named in October by the employees. August and September issues have already appeared.

Rock Island County recently awarded a contract to the Rock Island Fuel Co. to furnish between 600 and 700 tons of coal to the county buildings at \$6.04 a ton until Sept. 25 and 25c. per ton higher after that date. This is a much lower price than last year. There were six bidders in the field. Saline County coal will be used.

Much railroad activity is centered around Orient mines Nos. 1 and 2, at Orient, near West Frankfort, and with the completion of two switches a total

of four roads will serve these two large coal plants. The four roads are the Illinois Central, the Chicago, Burlington & Quincy, the Chicago & Eastern Illinois and the Missouri Pacific. Mine No. 1 holds the world's record for hoisting from a single shaft in eight hours time, but the new Mine No. 2, where a skip hoist went into service Sept. 12, is expected to exceed the former when fully developed.

### INDIANA

F. J. Rawson and James G. McCarty, of the U. S. Bureau of Standards, are spending about a month in Vigo County, in research work on coal-mine tipples scales. They have nothing to do with the accuracy of the scales other than to recommend to the operators the best method to correct causes of error. They first made a trip through this vicinity in 1921 and another in 1923. They make reports to Washington from which bulletins are compiled giving information as to the best type of scale to install in a particular type of tipples.

Orders have been received at the Ingle No. 8 mine, at Petersburg, owned by the Ingle Coal Co., to clean up the mine preparatory to reopening at once. The mine, which is the largest of the Ingle system in Pike County and which gives employment to 350 miners, closed down nine months ago. It is connected with the Southern Ry. by an eight-mile switch, but arrangements are being made to connect the mine with the Big Four R.R. system by building a switch to the new railroad recently constructed by the Gray brothers of Evansville to their new stripping mines at Simtown, two miles south of Arthur. Less than two miles of track will have to be laid to connect the big Ingle No. 8 mine with the Big Four.

### KANSAS

Mine No. 18 of the Sheridan Coal Co., near Pittsburg, has been reopened.

The Missouri Pacific has put in operation two new through coal trains from Pittsburg to Kansas City, Mo., giving one-day service from the Pittsburg field to the Kansas City market. The move was made necessary by increasing coal shipments, the road announced.

A steel tipples will be installed by the Pittsburg Block Coal Co. at its mine near Dunkirk.

William Bogartz, in announcing his candidacy for re-election as president of the United Mine Workers of District 14, states that he has been unable

to carry out the policies he had mapped out upon entering office. "I encountered opposition from some of the rank and file and I did not have a working majority on the district executive board," he said in a published statement. Secretary H. W. Burr also has come out for re-election. Both have opposition. The number of candidates for district offices is unprecedented. Interest still centers on whether Alexander Howat will enter the race for president and whether the international Board will attempt to bar him as ineligible.

The Crowe Coal Co. has reopened its mines Nos. 15 and 21, in the Pittsburg field.

Leon Besson, state mine inspector, and W. D. Ryan, Kansas City, safety commissioner for the Bureau of Mines, called miners and operators for a meeting Oct. 1 to revive interest in mine-rescue work and begin arrangements for a Kansas safety meet in 1925. An intensive training campaign for the miners of the state will be launched immediately, training having become disorganized during a long period of mining inactivity. Practically all mines are again in operation and it is proposed to effect a safety organization at each one.

A new type steel conveyor tipples, the first such conveyor and the fourth steel tipples of any kind in the Kansas field, has been installed by the Dunkirk Coal Co. at its steam-shovel mine a mile west of Mulberry. Representatives of fifteen operating companies watched a test of the apparatus Sept. 29. A platform upon which may be driven wagons bringing coal from the pit, is installed a short distance from the railroad spur. A balance arrangement allows the rear end of the wagon to be lowered so that the load slips into a hopper beneath the platform. Here the conveyor belt picks it up and carries it to the top of the gravity screening and loading chute which makes lump and a smaller size known in the field as "nut run." The only other steel tipples in the district are at two shaft mines of the Sheridan Coal Co. and one shaft mine of the Katy Coal Co.

### KENTUCKY

The Peerless-Elkhorn Coal Co., Justell, Ky., has under development 1,000 acres of coal land, and will have daily capacity of 800 tons. F. G. Hutton, 150 E. Broad St., Columbus, O., is president.

James B. Torbert, formerly of the Phoenix Mine, near Drakesboro, who sold out in western Kentucky a



couple of years ago, is president of the new Harlan-Wallins Coal Co., which will own and operate the former plant of the Wallins Creek Collieries Co., in the Harlan field. Banks of Nashville, Tenn., are now offering a \$600,000 issue of 7 per cent gold bonds of the new company, to be used in the financing of the proposition.

The Cumberland Straight Creek Coal Co., of Pineville, will rebuild its tippie which was recently destroyed by fire, with a loss estimated at \$100,000. This tippie is located at Logan's Switch.

The Ulva Coal Co., Ulva, will let the contract at once for erection of a store building to replace the structure recently destroyed by fire, with a loss of \$10,000.

Another tippie has been burned in western Kentucky. This one belonged to the Old Hickory Coal Co., four miles out from Providence, in Webster County. The loss was about \$15,000, partly insured. The fire is believed to have been of incendiary origin.

It was reported from Whitesburg, on Sept. 21, that the Gorman-Pursiful Coal Co. would start operating a new mining plant at Sandlick within a few days, the plant starting off with a daily loading capacity of fifteen to twenty cars.

## MISSOURI

The Kansas City Midland Coal Mining Co. has reopened its 800-ton mine at Novinger.

The Walton Coal Co., of Higby, has sold its mine and equipment to a group of fifty miners who will operate it co-operatively. The mine is rated at 500 tons. The company also leased its coal lands to the miners on a royalty basis for all coal mined.

## NEW YORK

The Iroquois Gas Corporation, of Buffalo, will complete its byproduct coke plant at Winchester, near Buffalo in time to add daily 13,000,000 cu.ft. of gas to the city supply next winter. This ought to add 12,000 to 15,000 consumer families to the company's list, who would otherwise need to burn coal.

Robert H. Burrows and William R. McTurk have retired from the firm of W. A. Marshall & Co., New York City, after fourteen years' service as officers and directors. To fill the vacancies caused by their retirement John D. Kline and Raymond Havemeyer have been chosen as directors and vice-

presidents. C. W. Sandford and G. B. Talbot, formerly in business together, have joined the sales organization of the company.

## OHIO

Fire of undetermined origin destroyed the coal tippie and all equipment at mine No. 402 of the Sunday Creek Coal Co., at Santoy, recently at a loss of \$200,000. The tippie, which was electrically operated, was known as the best equipped plant in Ohio. County officials are investigating the fire, which will throw more than 400 men out of employment. It was one of the few mines in this section that was operating full time.

"Buy Ohio coal—There is none better," is the legend ordered by Governor Donahy to be printed on a large block of coal weighing approximately 2,400 lb., which has been placed in front of the north-side approach to the State House at Columbus. The huge block of coal was sent from the Massillon district and was exhibited at the State Fair by a Massillon coal company. The company presented the block to the Governor. It was received at the State House recently, carefully crated.

First-aid training among miners in Ohio will depend entirely upon state inspectors of the mine division and use of Ohio's mine-rescue trucks and car, declared Jerome Watson, when he explained to Herman R. Witter, industrial relations director, that the U. S. Bureau of Mines rescue car stationed at Columbus had been withdrawn from service in Ohio for three months. Ohio is planning for a great first-aid and safety meet soon, such as was held Aug. 15 at Bellaire, Belmont County. The government has aided in this training, but such work is being carried on in Kentucky and the use of the Ohio car of the federal mine department is required there.

## OKLAHOMA

The Pine Mountain Coal Co., of Heavener, Okla., has increased its capital from \$65,000 to \$250,000, and will build an entirely new plant, and install new machinery.

John Patterson, the 70-year old superintendent of the Kali-Inla Coal Co.'s mine at Cambria, Latimer County, claims to be the oldest active miner in the state. He began working in the mines in Scotland when he was 10 years old. He has worked in southeastern Oklahoma for 26 years. He it was who

met the several hundred union miners from an adjoining county who marched to Cambria a few weeks ago, intent on stopping the non-union operations. Alone and unarmed, Patterson parleyed with the leaders of the union "army," and as a result, threatened bloodshed was averted.

Oklahoma's coal production was 1,991,733 tons in the fiscal year ending last June 30, as against 1,945,294 tons in 1922-23 and 2,578,005 tons in 1921-22. The figures are from the annual report of Chief State Mine Inspector Ed Boyle. Coal mined, by grades, included 392,390 tons of lump, 106,622 tons of nut, 299,864 tons of pea and slack. There were 114 individual mines in operation in the state in 1923-24, the report shows.

As the result of recent renewed firing on state guardsmen patrolling the open-shop mine district of Latimer County, Adjutant General Baird H. Markham has reconsidered his intention to withdraw his troops. They will be left on the scene indefinitely. The guards stationed in the district have machine guns at the plant of each mine. Eight mines are now operating on a non-union basis, with 400 men employed at the 1917 wage scale of the United Mine Workers. A number of additional mines will reopen in the McAlester district early in October, all announcing that they will pay the 1917 bituminous scale. Two hundred men have been put to work in Creek mine No. 1 of the Crowe Coal Co., in the Henryetta field. This makes a total of 20 mines now operating in this field and at least 10 more are making plans to reopen during October.

## PENNSYLVANIA

The Superior-Connellsville Coal & Coke Co., of which George Whyel of Uniontown, Pa., is president, recently sold 202 acres of coal land at Simpson Station, near Brownsville, to Columbus R. Porter, of Brownsville, for \$370,000. The property sold was purchased from Mr. Porter in 1919 and adjoins the Superior mine operated by the above named company. The coal is in the Pittsburgh seam.

The balance sheet of the Glen Alden Coal Co., as of Dec. 31, recently issued, shows total assets of \$29,654,283, including \$9,887,669 in securities, \$4,378,302 in coal on hand, and \$9,209,413 in accounts receivable. Accounts payable amounted to \$6,355,481 and the surplus was \$4,966,766.

Business in the Connellsville coke region is picking up. The Hillman Coal & Coke Co., of Pittsburgh, Pa., resumed operations Sept. 25 at the Tower Hill No. 2 mine near Republic, after having been idle there for nearly a year. The H. C. Frick Coke Co., subsidiary of the United States Steel Corporation, has increased operations at the Collier and York Run plants and fired 100 additional beehive ovens at scattered operating plants.

The Glen Alden Coal Co. has mapped out extensive plans for a tree-planting program which will get under way in the spring of 1925. The company has much idle land which can be used for the future production of mine timbers and the work now contemplated will produce



### A New Kentucky Tippie

This steel structure has just been put into service by the Southern Mining Co. at Black Snake, Ky. It stands at the bottom of a steep tramway.



a forest growth in the years to come. Huge tracts of forest land on the West Mountain, just beyond the city limits are to be the scene of the initial tree-planting operations of the Glen Alden company. Years ago this land was the location of heavy stands of timber and the program now decided upon by the coal company gives promise of a reproduction of that growth within a quarter of a century. Forty thousand trees are to be set out by the company.

The Peabody Coal Co., of Chicago, is negotiating for the purchase of the No. 6 colliery of the Pennsylvania Coal Co., at Pittston, it is reported from authentic sources. Recently representatives of the Chicago interests visited the colliery and made a survey of conditions and equipment. At present the colliery is idle due to a strike, called without sanction of the district office of the United Mine Workers, because of alleged inequalities in wage rates in a section of the mine.

Fire, raging for several days in the Oakmont mine of the Hillman Coal & Coke Co., at Barking Station, near New Kensington, was brought under control Sept. 16 by members of the Pittsburgh station of the U. S. Bureau of Mines following the erection of brick walls. Operations in the mine were suspended when the blaze, about 200 ft. below the surface of the mine, threatened to assume serious proportions. Officials of the company said they would be unable to estimate the damage until an investigation had been made.

New officers named by the executive committee of the Hazleton Mining Institute are Commissioner James Harlor, president; D. E. Keller, superintendent of the Harwood Coal Co., vice-president; S. W. Smith, secretary-treasurer. It was decided to hold the annual banquet on Oct. 28, if suitable arrangements can be made.

The equity action in which the Philadelphia & Reading Coal & Iron Co., the New York Midd Fields Coal & Railroad Co. and the City of Philadelphia, trustee under the will of Stephen Girard, against the county commissioners of Columbia County, seeking a reduction in the valuation of property by the commissioners, has been continued until Dec. 1.

## TENNESSEE

The Connellsville Coal & Coke Co., Connellsville, Pa., of which D. B. Northrup is president, is reported to have purchased 8,000 acres of coal land from the Waldensia Coal Co., Waldensia, and 1,200 acres from the Missouri Coal & Land Co.

## UTAH

Application to increase the minimum weights for loading coal cars has been filed with the Public Utilities Commission by the Denver & Rio Grande Western, the Bingham & Garfield, the Utah Ry., the Utah Terminal Co. and the Carbon County Ry. The minimum weight is now 40,000 lb., but this is obsolete, for the reason that there is now no standard gage equipment used for the transportation of coal with a

capacity so small as 40,000 lb., the petition sets out. The petitioners state that if they are granted permission to make the desired changes, uniformity will be obtained in coal tariffs and the minimum-weight rule will be the same in Utah as is applicable from Utah mines to interstate points in Nevada, California and other Western states. It is suggested that for cars of the marked capacity of 50,000 lb. the minimum weight be 48,000 lb.; for cars of 60,000 lb., 58,000 lb.; for cars of 80,000 lb., 60,000 lb.; and for cars of the marked capacity of 100,000 lb., 80,000 pounds.

## WEST VIRGINIA

A new tipple is being built and other improvements made at the plant of the Chaplin Collieries Co., on Scott's Run, preparatory to resuming operations on an open-shop basis.

The White Rose Coal Co. has disposed of its stripping operation near Viropa, Clay District, Harrison County, for \$112,500. The property includes about thirty acres of coal, steam shovels, locomotives and other equipment. The Walton Coal Co., which is the purchaser, is understood to be an organization of New York capitalists. Thirty thousand dollars was paid in cash, the balance being secured by a deed of trust.

Efforts to extinguish a fire in the new Lincoln mine of the Lorain Coal & Dock Co. have proved unsuccessful and state inspectors have given up the fight for the time being and that portion of the mine where the coal is on fire will be sealed up again. The fire broke out on Aug. 22 and at that time a section of the mine was sealed in an effort to smother the blaze. But at the end of two weeks it was found that the fire had spread. It was decided after resealing a section of the mine to permit operations on a 60 per cent basis and work was resumed on that basis on Sept. 22. The miners will work in such sections of the mine as have not been affected by the fire.

## CANADA

At a special general meeting of preferred shareholders of the Dominion Coal Co. held in Montreal recently consent to the proposal to create a \$15,000,000 mortgage, as required on the company's property, was given and the meeting authorized the mortgage.

The Princeton (B. C.) Colliery Co. is sinking a new shaft on the town site of Princeton, B. C., and is preparing for the construction of a new colliery.

Charles Graham has taken over the management of No. 5 Mine, Comox, Canadian Collieries (D), Ltd.

Dr. R. L. Rutherford, of the Canadian Geological Survey, has returned after a season in Northwestern Canada from the Brazeau to the Athabasca Rivers. This year's work will supplement that of the two past years, the survey now having been completed from the North Saskatchewan to the Athabasca. Dr. J. A. Allen, under whose supervision the survey has been made, says that a geological map will be prepared similar

to that already made of Alberta coal fields. Another party under J. O. Sanderson has been continuing work in the Drumheller coal field. It is said that the seams of the Carbon, Three Hills, Trochu, Big Valley and Sheerness country are quite similar to those of the Drumheller district.

## Industrial Notes

Zeb Stafford, formerly with the Higrade Oil & Gas Co., at Logan, W. Va., has severed his connection with that company and is now representing the **Hulbert Oil & Grease Co.**, of Philadelphia, in the Logan district.

The **Continental Car Co.** of America, Louisville, makers of mine cars, and the **Kentucky Wagon Mfg. Co.**, of the same place, are merging. The car company has moved offices to the wagon company plant.

**C. L. Berger & Sons, Inc.**, of Boston, Mass., makers of engineering and surveying instruments, have appointed the **New York Blue Print Paper Co.**, 102 Reade Street, New York City, exclusive export agents for Latin America; this in addition to the exclusive agency for New York and New Jersey previously allotted.

The **Ohio Brass Co.** has moved its Philadelphia office from the Witherspoon Building to 1404 Packard Building, at 15th and Chestnut Streets.

**Frank A. Wilch** who has been associated with the Cleveland office of the **Triumph Electric Co.**, has been placed in charge of that territory. He succeeds **Edward S. Ford**.

**B. N. Broido** who has been doing special consulting work for **The Superheater Co.**, of New York and Chicago, recently was appointed chief engineer of the industrial department of the company.

The **Dings Magnetic Separator Co.** announces that **H. M. Gassman**, who handles Dings magnetic separators in Birmingham, Ala., has moved to a new office at 513 N. 21st St.

At the annual stockholders' meeting of the **Allison Coupon Co.**, of Indianapolis, Ind., a reorganization of the management was effected with the election of **M. J. Allison** as president, **James A. Allison** as secretary, **J. S. Berryhill** as treasurer and **John H. Allison** as general manager.

## Publications Received

**First Annual Report, Department of Labor, Tennessee, 1923.** Pp. 174; 6x9 in.; illustrated. Includes reports of Divisions of Fire Prevention, Mines, Workshop and Factory, Workmen's Compensation and Hotels.

**Bituminous Coal Losses and Mining Methods in Pennsylvania, Including Thickness, Character and Reserves of Coal,** by **James D. Sisler.** Topographic and Geologic Survey, Dept. of Forests and Waters, Harrisburg, Pa. Bulletin M 4. Pp. 216; 6x9 in.; illustrated.

**The Property Owner's Handbook** is the title of a 32-pp. booklet issued by the **American Appraisal Co.**, Milwaukee, Wis. Constitutes a collection of suggestions which anyone responsible for the management of property will find of interest.

**Annual Report of the Mineral Production of Canada During the Calendar Year 1922.** Dominion Bureau of Statistics. Mining, Metallurgical and Chemical Branch, Ottawa, Canada. Pp. 228; 6x9 in.; charts and tables.

**The Deep River Coal Field of North Carolina,** by **Marius R. Campbell** and **Kent W. Kimball.** North Carolina Geological and Economic Survey, Chapel Hill, N. C. Bulletin No. 33. Pp. 95; 6x9 in.; illustrated. Covers results of examination by geologists of the U. S. Geological Survey co-operating with the North Carolina Geological and Economic Survey.

**Annual Report of Coal-Mine Inspection and Mine-Rescue Departments, Kansas, 1923.** Court of Industrial Relations, Topeka, Kan. Pp. 149; 6x9 in.; tables.



## Traffic

### Want Freight Rates Favorable To Kansas Coal

F. J. Bannister, president of the Kansas City Chamber of Commerce, and other officials of that organization, in a conference, Sept. 18, with the Pittsburg (Kan.) Chamber of Commerce, declared they will in the future do their utmost to bring about adjustment of coal freight rates into Kansas City which will be favorable to Kansas coal. Mr. Bannister said that the traffic department of the Kansas City Chamber in working for lower Illinois coal rates in the past had to a degree overlooked the effect upon the mining industry in the Pittsburg field, which is regarded as a part of Kansas City's immediate trade territory.

Pittsburg men had pointed out to the visitors that it is directly to the benefit of Kansas City's business to promote the industrial prosperity of a population of 150,000 persons within a radius of 150 miles of that city. Illinois coal has been Kansas' stiffest competitor for the Kansas City market. Through freight rates Illinois has been gaining in the race, Kansas operators say. A concerted effort is now being made to convince Kansas City business men that southeastern Kansas coal mining is a "home industry" so far as they are concerned. One coal company is conducting an extensive advertising campaign in the Kansas City newspapers to emphasize this appeal.

### Allow 25c. Ton for Transfer Of Bunker Coal

An allowance of 25c. a ton for transferring bunker coal from cars to vessels at New Orleans was found reasonable Oct. 2 by the Interstate Commerce Commission.

The ruling was made in the case of the New Orleans Coal & Bisso Towboat Co. against the Louisville & Nashville. The rail carrier allowed only 11c. for the services but it said it was willing to make a retroactive allowance of 25c.

The commission said it would order the carrier to make good the difference of 14c. a ton for each ton handled.

### Charges Unequal Share of Cars

The Francisco Mining Co., of Chicago, has attacked the equity of coal-car distribution at Francisco in September, 1922, and asked damages in the sum of \$100,000, caused by the failure to deliver cars in the same proportion as to other mines in the vicinity.

## New Companies

The Eureka Coal Co. has been incorporated in St. Louis, Mo., with a capital stock of \$50,000, by W. J. Miller, J. M. Whelan, 4222 W. Pine Street, and L. M. Steed.

The Royalton Coal Co., capital \$10,000, has been incorporated in St. Louis, Mo., with H. H. Taylor president and Jesse Irwin Taylor secretary.

The Lenox Coal Co. has been incorporated in Frankfort, Ky., by Clay Hunley, H. M. Collins and others.

The Walton Coal Mining Co. has been organized to operate in Harrison County, West Virginia. Capitalized at \$100,000, the company is to have its general offices at Clarksburg, W. Va. Having an active part in the organization of the new company was Daniel Howard, one of the leading operators of the Harrison County field. Associated with him in the new company are C. F. Yates, C. C. Starkey, C. B. Johnson and Margaret Heitz, all of Clarksburg.

The Anchor Coal Co., Carbon Hills, Ohio, has been incorporated with a capital of \$10,000 to operate coal mines and sell coal and coke. Incorporators are I. W. Achauer, W. R. Saunder, John Saunders, John Dicken and C. Cee.

The Hill-Crest Coal Co., Fourth & Market Sts., Steubenville, Ohio, has been chartered with an authorized capital of \$50,000 to mine and sell coal. Rosa C. Anderson, Fred A. Stone, Robert J. Peterson, William E. Matlack and Carl E. Anderson are the incorporators.

The Blue Valley Coal Corporation, Madisonville, capital \$20,000, has been incorporated by H. H. Coil, F. E. Coil and J. A. Jonson to handle mine operations. The Coil family has been well known in western Kentucky coal developments for years.

The Millville Coal Co., Salem, Ohio, has been incorporated with a capital of \$25,000 to mine and sell coal. The incorporators are C. A. McKinley, W. L. Petlit, H. L. McCarty, Homer H. Hickling and Roscoe Nye.

The Beaver Coal Co., Swansea, Ill., has been incorporated with capital of \$25,000 to do a general coal mining business. The incorporators are A. C. Danielson, Theodore Sirene and Albert G. Ziesk. The company is served by the Louisville & Nashville R.R.

The Solar Coal Co., Belleville, Ill., has been incorporated with capital of \$180,000 to conduct strip-mine operations near Lemenston. The incorporators are W. C. Wolf, Robert White, Samuel White, Frank Sergeant, Albert L. Klee, John Macke and John L. White.

The T. H. Cameron Fuel Co., Ltd., has been incorporated with \$250,000 capital and head office in Montreal, Canada, to mine, import and deal in coal, by Chilton G. Heward, Henry M. Hague, H. W. Shearer and others.

The Highland Coal & Mining Co., with offices in the Safety Building, Rock Island, Ill., has been incorporated with capital of \$25,000. The company will develop a mine on the farm of William M. Ferry, located approximately two miles from Moline, on what is known as the Highlands. Preparations are being made to sink the shaft, which will be completed within the next month. The shares in the company are owned largely by Rock Island and Moline people.

## Coming Meetings

National Coal Association. Board of Directors' meeting, 9.30 a.m. Oct. 10, Washington Hotel, Washington, D. C. Open to association members and those interested. Executive Secretary, H. L. Gandy, Washington, D. C.

American Institute of Mining and Metallurgical Engineers. Fall meeting, Birmingham, Ala., Oct. 13-15. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

American Institute of Electrical Engineers. Fall convention, Pasadena, Calif., Oct. 13-17. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

American Gas Association. Sixth annual convention and exhibition, Steel Pier, Atlantic City, N. J., Oct. 13-17. Secretary, Alexander Forward, 342 Madison Ave., New York City.

Canadian Institute of Mining and Metallurgy. Sixth annual Western Meeting, Oct. 16-18, Blairmore, Alta., Can. Secretary, Moses Johnson, Blairmore, Alta., Can.

Illinois Mining Institute. Annual meeting, Nov. 22, Elks Building, Springfield, Ill. Secretary, Martin Bolt, Springfield, Ill.

West Virginia Coal Mining Institute. Annual meeting, Dec. 2-3, Welch, W. Va. Secretary, R. E. Sherwood, Charleston, W. Va.

Coal Mining Institute of America. Annual meeting, Dec. 3-5, Chamber of Commerce Bldg., Pittsburgh, Pa. Secretary, H. D. Mason, Jr., 909 Chamber of Commerce Bldg., Pittsburgh, Pa.

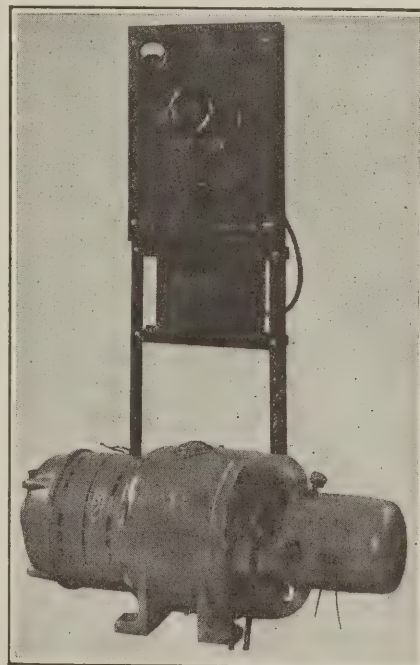
West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers. Fourth annual convention, Dec. 12 and 13, Huntington, W. Va. Secretary-Treasurer, Herbert Smith, Huntington, W. Va.

## New Equipment

### Welding Generator

The Allan Manufacturing & Welding Co., 726 Washington St., Buffalo, recently developed and placed on the market a 120-cycle arc-welding generator suitable for any power installation. The armature is built up on a large-diameter shaft and is carried on two ball bearings. An extension of the shaft carries the exciter armature, the frame of which is cast integral with one end bell. The exciter is eliminated where direct current is available.

The 4-kw. size has a range of 50



### Welding Equipment and Control

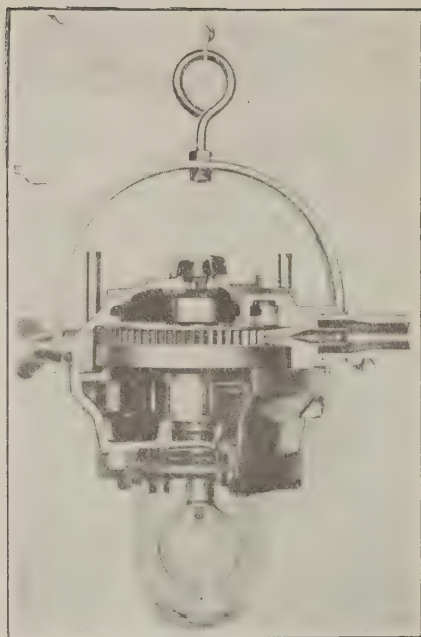
Almost any current value up to the full capacity of this apparatus makes it suitable for all kinds of welding or repair work.

amp. to 200 amp. continuous output, with an unlimited number of steps between these limits. With this new generator great ease of operation is obtained. The arc is easy to start and maintain and the apparatus is designed for smooth and rapid deposition of metal with the necessary penetration. This new welding generator also embodies a new feature for use in connection with the welding of light cast-iron sections.

### Air-Driven Generator for Safe Electric Lamp

Through the invention of a portable, pneumatic-electric lamp, another step forward has been made towards more effective illumination in collieries and in other places where electric sparking or an open flame might prove disastrous. A good light at the coal face or in the roadways simplifies the work of coal digging and, likewise, increases the safety of the miner by making more





**Pneumatic-Electric Lamp**

This vertical section view shows the turbine, generator and light bulb of this safety lamp.

clearly visible cracks and other signs indicative of a falling wall or roof. Efficient lighting also tends to reduce the much dreaded disease of miner's nystagmus; and, apart from added security, assures an increased output. In this connection it is interesting to note how compressed air, by improving conditions and by reducing hazards, has again come to the assistance of those who work underground.

Though this new lamp is especially fitted for service wherever explosive gases may be encountered, as in collieries, near gasoline tanks, etc., there are also many other places where it may be used to advantage. For example, where a slope or tunnel is being driven by means of compressed air it is much more convenient to employ a number of these lamps than to carry electric cables along as the work progresses. The lamp gives a bright light; and draws its operative air from the same source that supplies energy to drive the rock drills or other tools.

In designing this lamp, particular attention has been paid to the elimination of fire risks. The electric generator is an alternator with a revolving field magnet. Hence, there are no rubbing contacts or brushes of any sort which might cause sparking. The whole generator casing and the glass cover which protects the electric bulb are in communication with the exhaust side of the turbine; and a pressure of from 1 to 2 lb. per square inch is maintained by a spring-loaded exhaust valve. The outside atmosphere cannot, therefore, obtain access to the interior of the lamp when the latter is operating.

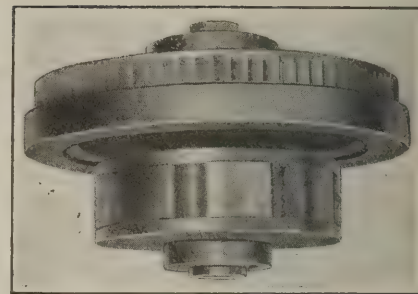
For service in coal mines, the lamp is provided with a further safe-guard—a device which cuts off the current from the bulb contacts should the excess pressure within the protecting glass cover fail through any cause. Any accumulation of gas in the protecting glass, or in the body of the lamp is prevented by a small hole communicat-

ing with the atmosphere so that a steady stream of scavenging air passes through the whole lamp whenever it is running.

The lamp body consists of two cylindrical castings. One of these carries the generator stator, cut-out, lamp holder, and protecting glass, while the other holds the bearing that supports the turbines, the turbine jet, governor, and exhaust valve.

This turbine is fitted with a single nozzle that can be easily detached for inspection or replacement. This nozzle is provided with a strainer to arrest any particles of dirt which might otherwise be drawn into the nozzle and clog it. The lamp is furnished with nozzles of six different sizes for pressures ranging from 35 to 120 lb. per square inch. With a 24-watt bulb and pressures of from 80 to 100 lb. per square inch, there are consumed approximately 4 cu.ft. of free air per minute, while 5 cu.ft. of free air per minute are needed when the lamp is operating at a pressure of 40 cu.ft. per square inch.

The complete lamp with swivel mounting weighs 14 to 15 lb. not including the air line or control valve. It has a normal rating of 24 to 36 watts—



**Turbine and Generator Rotor**

A sparkless generator with neither slip rings or commutator supplies current to the lamp which is sealed from external air. The lamp may therefore, be used in dangerous gaseous mixtures.

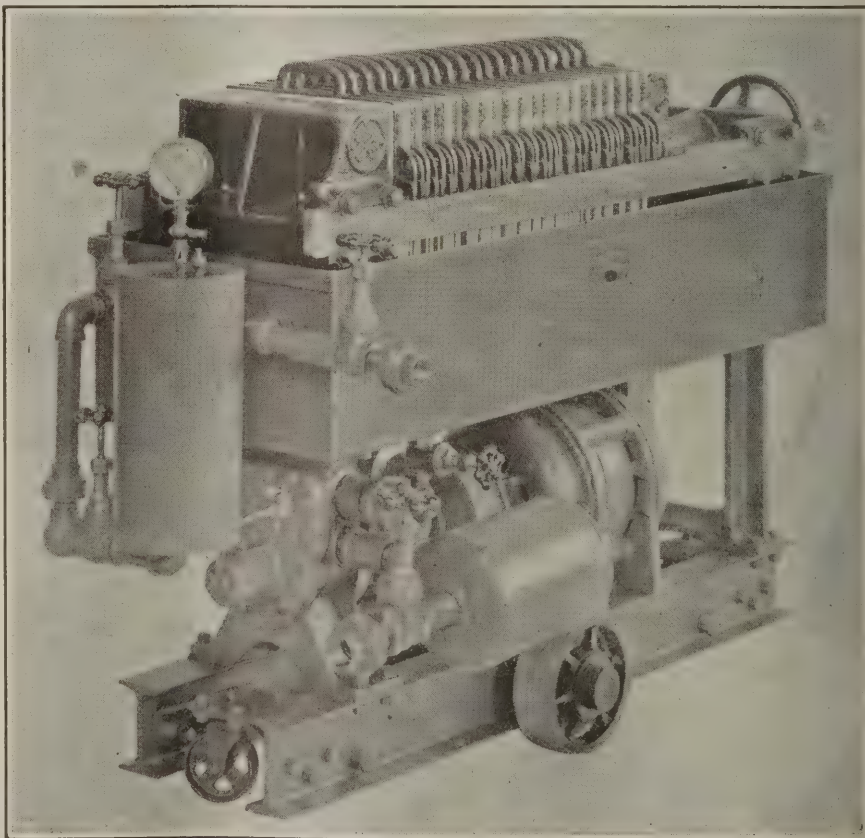
the equivalent of gas filled bulb of about 32 and 50 cp. respectively. Standard 12-volts, automobile head-lamp bulbs are employed; and the lamp is supplied with opal glass, to give a diffused light, or with a reflector, if a concentrated beam is desired.

These lamps are manufactured by the M-L Magneto Syndicate, Limited, Victoria Works, Coventry, England, and were recently described in *Compressed Air*.

### Transformer-Oil Filter Has Bell to Test Connections

Another improvement has been added to an oil filter press made by the General Electric Co. An air bell for testing the suction piping, so as to avoid mixing any large quantity of air with the transformer oil as it is being purified, has been applied to the press. This

air bell is arranged so it can be pumped up to the shut-off pressure of the filter-press pump. The pump is stopped after the suction-pipe valve is closed at the transformer drain, then the stored air is automatically released against the oil in the suction piping. Leaks are easily detected by oil coming through defective parts or connections. Air bells are available for existing filters.



**Filter Affords Oil of High Dielectric Strength**

This 30-gal. per minute oil-filter is equipped with an air bell to detect leaks in the suction-pipe connections. Air in these connections may be mixed with the oil, and its dielectric strength may be lowered.



# COAL AGE

McGraw-Hill Company, Inc.  
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Devoted to the Operating, Technical and Business  
Problems of the Coal-Mining Industry

R. Dawson Hall  
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## The Old, Old Question

THE DIFFICULTY and perhaps injustice of curing overdevelopment of coal by arbitrarily prohibiting the sinking of new mines is illustrated by the case of North Carolina. That state needs more power. The demand already has reached a point that justifies the development of home deposits of coal, in spite of factors which have limited their exploitation up to this year, according to the state's geological survey. The Deep River field with a present potential output of only 100,000 tons annually is especially at the fore. Should this field be encouraged to increase its output during the next few years to the million-ton mark which seems, to the state survey, to be "a reasonable vision"? Who is there to say North Carolina nay, especially if she embarks broadly and intelligently upon a program of byproduct coking? It is the old, old question which has no answer.

## Yes, It Can Be Done, Mr. Lewis

THERE really is such a thing as fearless, righteous control of a labor union. The International Pressmen's Union of North America proves it. So we respectfully invite the attention of John Lewis, "the most powerful labor leader," to the fact that President Berry of the pressmen, who whipped back into line the New York locals after a strike in violation of contract and who then made them pay the cost of that strike, has been upheld by the International at its Knoxville convention. Such a thing as punishing contract violators is, therefore, possible, and we don't want Mr. Lewis to overlook it.

No, we haven't forgotten that President Lewis booted Alexander Howat and the whole kit and caboodle of Howat office holders out of the union when they struck in Kansas in spite of Lewis' orders. That was considerable, of course, but we must add that defense of the sacredness of contract was not the only thing that motivated our dogged faced (the first adjective has two syllables, not one) miner chieftain. Howat was and is a radical whose policy is to destroy everything at all costs. He would gleefully destroy the miners' union if he could. In fact there was some slight danger of that very thing for radicalism just then was on the gain. So Mr. Lewis, in smacking Howat flat was defending the contract with one hand but with the other, and with every political force at his command, he was defending his own union organization.

The question that occurs to us is: Why hasn't the dogged (two syllables again) faced miner president risen as gallantly to the defense of the sacredness of other contracts that have been broken repeatedly? There were plenty of opportunities. But Mr. Lewis and his state chiefs have not made the rank and file understand that the whole force of the organization is behind signatures on contracts. Mr. Berry has made

New York understand this, and his rank and file support him. What ails the rank and file of miners? Are they contract violators by nature or is it just that President Lewis is afraid of them?

## Searching for the Causes

DURING recent years we have noted considerable progress being made in the more efficient and safe use of electricity in the mines. Electric drives have been applied to equipment which previously had been driven by steam engines because of fire or explosion hazards. Higher voltages have been introduced into the mines. Some companies have successfully applied electrical equipment which not long ago was considered highly dangerous.

Much of the credit for the success of this work is due to the careful and considerate engineering of some few of our leading engineers and also to the work and investigations of the Bureau of Mines. Experimental work, research, investigation and tests of the Bureau have shown the dangers of the use of certain types of apparatus when they come in contact with gaseous mixtures. Tests, recommendations and approvals markedly have reduced hazards of electrical equipment. Today we have permissible electric lamps, controllers, headlights, locomotives, fuses and portable storage battery power units; also, recommendations and suggestions which, if followed, greatly reduce liability of accident from other sources.

## Others Suffer Too

COAL MINING isn't the only industry suffering the pains of overdevelopment. Consider oil. Always reckless, always prodigal, the host which produces American oil rushed men, money and machinery around the country in the boom days during and immediately after the war, sinking 25,000 wells and half a billion dollars in twelve months! The country had to have that oil and it got it. Since then the host has been busy trying to save itself from inundation by the flood it produced. The best protection the oil host could raise apparently, was a counter flood of more oil.

The results of this policy are many and disturbing. Chief among them is waste. Where the coal producer leaves an average of only a little over one-quarter of the total deposit in the ground, the oil man leaves three-quarters. And there are oil losses in handling and consumption that rival the well-advertised wastes of coal. While, of course, strenuous efforts are made to check this heavy loss of oil, the dominating idea in the head of every oil man is: "Where can I bring in more good wells?"

"It is all too evident," says George Otis Smith, director of the U. S. Geological Survey, "that the oil business is traveling 'in high' with the gear shift locked. Everything is speeded up; the urge of ever-



increasing consumption stimulates the provision of surplus capacity in wells and refineries; then a lively competition among producers leads to an artificial stimulation of demand, and the merry round goes on. It is a pace that kills—and loses money.”

So the coal man with the weight of non-producing mines crushing him down is not the only fuel producer harassed by overdevelopment. His industry has much grief in common with the oil man's. Somehow the less spectacular coal industry seems to us the sounder of the two. Its wastes are probably less, its future is better assured because its resources are, and its financing has no \$300,000,000 a year of fraudulent stock promotion charged against it by the Postoffice Department, as had the more alluring oil.

### “Standardization” Means Something Now

ALL THIS TALK about standardization which the country has heard these last few years is not mere high-flown language. There has been much definite accomplishment, thanks largely to the energy and resources of Secretary Hoover's Department of Commerce at Washington. Already the lumber industry has reduced the number of lumber-yard items by 60 per cent, a simplification that is counted on to check to a considerable degree the waste in that industry conservatively estimated at \$250,000,000 yearly. Woven wire fencing manufacturers have reduced their styles and sizes from 552 to 69. Hollow building tile types, sizes and weights have dropped from 36 to 19; forged tool varieties are down 46 per cent and so on. The list of simplifications is a long one.

Unfortunately there is not yet any extensive reduction to report in industries directly serving coal mines, nor in coal mining practice itself, although Col. Roberts' committee of the American Mining Congress is keeping the subject alive. The campaign of education is a long, uphill fight and can't be won in a day. But it can be won. Excessive stores of repair parts in mine stockrooms is one thing that is going to help the advocates of standardization. Some mining companies have already realized the cost of capital frozen up in such stocks. Others are waking up to it. Thus perhaps the propaganda has sunk deeper than we realize.

### The Intangible Something

THERE MUST be co-operation in any organization. No one was ever heard to contradict the many and frequently repeated statements to this effect. But, there is something in a highly successful mine-operating organization which came before and made co-operation possible. We seem to have no single word by which it is adequately expressed. It is in reality an urgent desire on the part of the salaried employees to promote the general welfare of the business.

There must be a good reason for this desire. In some cases it seems to be prompted by nothing more than a sincere respect or high regard for superiors, coupled perhaps with a sense of obligation because of fair treatment accorded or favors received. In other cases, ownership of dividend-paying stock of the employing company is the secret. Again, we find rare instances where a personnel is made up almost entirely of men who are far above the average in guarding the employer's interest.

Careful analysis of successful organizations would

perhaps disclose other secrets for promoting the interest of those who are in positions to “make or break” the average coal-mining company. There must be good management, and therefore real co-operation, but before this can be secured the management must in some way furnish an incentive for the employee to entertain at all times a desire for the general good of the firm.

### Let Coal Alone; That's All

WE AGREE with President Hutchinson of the National Coal Association that the one most important thing the coal industry needs is to be let alone—just let alone. It seems such an easy boon for the country to grant, yet what is the use of expecting the country to grant it? The whole coal industry surely knows that the only way it can protect its right to mind its own business is to fight for it. Imagine having to fight for a privilege which ought to be universal! But there are worse plights. One of them is to be compelled to accept the deserts of him who will not defend his own just cause.

If there are any thinking men in the coal industry who believe that they are secure against such bitter deserts, let them take heed of the straws in the gusty wind of the present national political campaign. Government-ownership sentiment is abroad in the land. The body of propaganda to which it belongs is rolling up a vote which next month will astonish some of these coal mine owners who lunch at the club together and easily convince each other that sound conservatism is bound to prevail. They are not counting even the union coal miners, who are certainly going to poll a heavy radical vote along with other dissatisfied elements.

This is not a prophecy that the next president of the United States will be a radical. But it is a prophecy that a radical sentiment for government ownership will register heavily at the polls next month and will be persistent in the next Congress. It may not put forth an immediate demand for public ownership of coal mines. A low-price year like 1924 is a poor one in which to tell the people they can run mines better than the owners. But it is not such a bad year to talk them into running railroads and other utilities. And coal is always next after railroads. That is the point.

Mr. Hoover has some sound arguments against government ownership of such utilities. He points out that utility service is better in America than in any other country, and that the 2,700,000 employees are paid wages giving the highest standard of living and comfort on earth. He shows that our railroads under government control during the war lost \$1,600,000,000 that was paid in taxes by the people and that the roads since then have not managed to bring their average earnings even up to 4 per cent. There is already commission control over rates and issuance of stock by utilities; why should we have more control than that? If the utilities were to be bought by the government, a tax revenue of \$600,000,000 would be stopped and the country would have to make it up in added tax burden.

Many a sane labor unionist sees the truth of these things, yet it cannot be denied that the government ownership nostrum is “going good” right now. The coal industry should awake to this fact. Sitting back and viewing with alarm from club windows will accomplish little. A hot battle to be let alone is immediately ahead. The sooner the industry pitches into that fight the better its chance of being let alone.



# Proper Handling and Storage Reduce Oil Losses

Higgledy-Piggledy Oil Storage Is Wasteful—At Some Plants One Fourth of the Lubricant Purchased Is Lost—Storage Underground in Tanks with Metering Pumps Conserves Lubricants

By ALPHONSE F. BROSKY  
Assistant Editor, *Coal Age*  
Pittsburgh, Pa.

IT WOULD not be far from the truth to say that at least 25 per cent of the oil purchased by the coal industry is wasted. Although unquestionably the major portion of this loss results from too-generous an application of oils and greases to the moving parts of machines, the fundamental cause of waste lies in the methods employed in storing, issuing and otherwise handling the lubricants before they are actually applied. The primary requisite for preventing much of this known waste is adequate facility for storing lubricants. System in the management of mines today is being extended to include this important item of production cost. Ten years or more ago it was a common sight at the mines to see barrels of oil scattered about with no pretense at orderliness. Spigots were not always closed tightly; sometimes they were not used at all.

### RESULTS OF CARELESS STORAGE AT MINES

The direct result of all this carelessness, chaos and confusion was that the ground on which the barrels stood fairly seeped oil. Men were allowed to help themselves to as much lubricant as they wanted as often as they desired. And when only a gallon or two that required coaxing to pour out remained in a barrel, this container was abandoned as empty and a full barrel tapped. This word picture of carelessness and waste is true to life and may yet be seen at many mines. The accompanying illustrations show several methods used for storing oil at the mines. Each has its place though as far as possible they have been arranged

in an ascending scale of merit, Fig. 1 exhibiting the most wasteful method and Fig. 4 the one most satisfactory and economical. Enough already has been said concerning the slovenly methods depicted in Fig. 1. If a company feels that it cannot afford to erect an oil house furnished with reservoirs and pumps, it at least can provide a rack constructed of rails resting on piers as shown in Fig. 2. By so doing a noticeable improvement over conditions existing in Fig. 1 is effected.

### OIL STORED IN TANKS ACCORDING TO GRADE

A still better method of storing oil is shown in Fig. 3. Here oil is emptied from the barrels in which it is received into tanks resting upon or raised slightly above the floor of the oil house. Three grades of oil are kept in a like number of tanks. In this particular instance one grade is for engines, another for pit cars and a third for conveyors. The methods illustrated in Fig. 4 are those used at the Lewis Mine of the Hudson Coal Co., near Clarksburg, W. Va. They are recommended as facilitating not only the storage but also the handling and issuing of lubricating oils. A better arrangement would be difficult to conceive. The oil house at the Lewis mine is 15-ft. square inside and is constructed of concrete blocks. It is provided with a cellar in which three steel oil drums are installed 5 ft. below the frost line. The floor of this building is of concrete reinforced with 40-lb. rails. Each of the three tanks has a capacity of 283 gal.

FIG. 1  
Slovenly Storage

Everything should have its place at a mine, in such a location that the worker will not be unnecessarily exposed to danger in reaching it. Placing these oil barrels between a main line and a mine track renders the oiler's job unnecessarily hazardous. They were probably placed here for the sole reason that this was a convenient dumping point from the freight car.

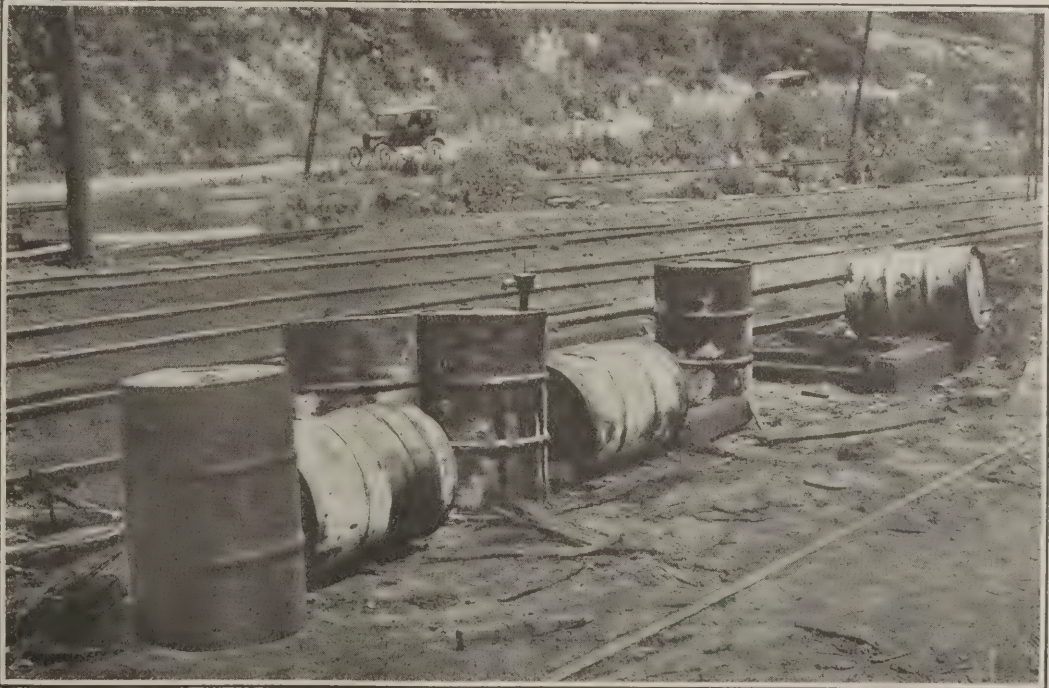






Fig. 2—Orderly Open-Air Oil Storage

If an under-cover storage cannot be afforded this picture shows the next best alternative. Here not only has order supplanted chaos but the barrels are supported at convenient height above the ground where their spigots are readily accessible.

and holds a particular kind of oil or that intended for some specific purpose. The pumps are so arranged that they may be adjusted to measure out a given quantity of oil, and float gages indicate the quantity remaining in the tanks at all times. As little space is occupied by the pumps there is sufficient accommodation inside the house for storing barrels of oil and grease.

#### GOOD LOCATION OF OIL HOUSE SAVES LABOR

Mines producing large tonnages of coal are big consumers of oil. At such plants provision should be made for eliminating all needless labor entailed in handling barrels between the railroad car and the oil house. One excellent plan for this purpose was adopted by the Jamison Coal Co. at its No. 7 mine at Barrackville, W. Va., now owned by the Bethlehem Mines Corporation. At this particular plant the oil house was located on the same spur as, and about 60 ft. from the supply building. The floor of the structure was at an elevation slightly lower than the floor of a railroad car, so that a bridge plank could be laid between the two levels.

All in all the layout was one which greatly lightened the labor of transferring barrels from the cars to the oil house. One end of the building was occupied by tanks and pumps, somewhat similar to those shown in Fig. 3, while the remaining space was used for

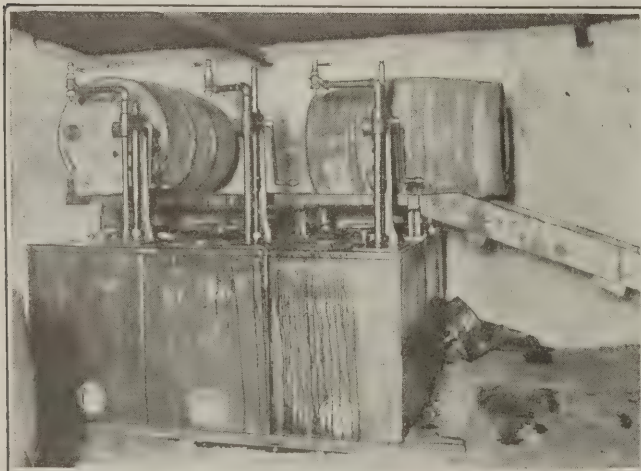


Fig. 3—Inexpensive Yet Efficient Storage

A small fire-proof building and three storage tanks fitted with a pump is about all that is necessary for this kind of a storage. Its chief shortcoming lies in the fact that the oil is unprotected from cold and in winter may become decidedly sluggish. A wooden incline facilitates raising full barrels to the rack above the tanks.

the storage of barrels which were rolled onto four slightly elevated tracks constructed of ordinary mine rails.

A few recommendations for the better handling of oils as suggested by the best practices now in general use may be enumerated as follows:

(1) Oil should be kept under lock and key and issued by the man in charge of supplies only upon presentation of a properly signed requisition.

(2) As a precaution against the spread of fire, oil should not be stored in the regular supply house or in any other building which, if burned, would result

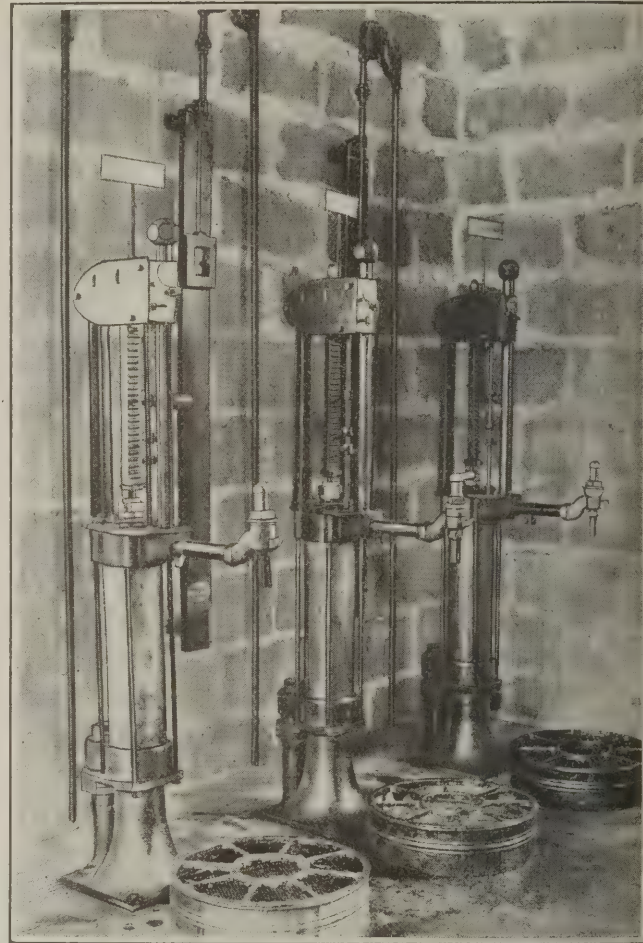


Fig. 4—Modern Oil-Handling Equipment

Means here employed for storing and issuing oil strongly resemble those used in an up-to-date gasoline filling station. The storage tanks are located in a cellar below the frost line. The pumps are provided with meters and the tanks with indicating floats so that an accurate check can be kept on the quantity drawn from the tanks and that remaining on hand.

in a heavy loss; it is wise to construct a fireproof building for storing oil. This should be placed at a distance of at least 60 to 100 ft. from any adjacent structure.

(3) The arrangement inside the oil house should insure sufficient warmth in the winter months to maintain the fluidity of a medium or heavy oil at or near the consistency attained in summer.

(4) Oil should be emptied from the barrels in which it is received into storage tanks from which it should be removed by pumping.

If these recommendations are adopted either wholly or in part, an appreciable saving will be realized. Furthermore, the potentiality of the fire hazard will be lowered. This is a consideration that cannot be disregarded as the danger of fire is ever present.



# Details of Actual Mining in Alabama Coal Beds

Thickness of Bed and Its Pitch Determine the Plan of Mining — On Moderate Inclinations Cars Are Taken to the Face — In Steep Beds Chutes or Conveyors are Used

BY MILTON H. FIES

Vice-President, De Bardeleben Coal Corporation,  
Birmingham, Ala.

JUST as a thin seam was treated in detail, as an example of a flat Alabama bed, a measure of medium thickness will be considered as being typical of the medium pitching class. Deposits of this type in Alabama are found principally in the Cahaba field. Conditions here encountered are extremely variable. All the beds pitch; in seams now being worked the dip varies from 5 to 49 deg., the roof over the coal varies from fairly good to bad; in some instances, entries and roadways in rooms are cross-collared. The rooms are timbered closely with heavy capboards over the props. The bottom varies from hard to soft. With these extremes in mind, it is manifest that the systems of mining and timbering followed differ from mine to mine, or even from section to section in the same working.

Coal beds in this field are opened on slopes that follow the coal from the outcrop (see Fig. 14). At intervals of from 200 to 300 ft., depending on the thickness of the measure, entries or lifts are turned right and left from the slope on the strike. The slopes have one or two air courses paralleling them, with a pillar 25 to 50 ft. thick between. When two air courses are driven, one is brushed, if the thickness of the coal makes it necessary, to a height of 6 ft. so that it may serve as a manway. This passage is usually 10 ft. wide. The other air course is from 6 to 13 ft. wide and is driven to the height of the coal. Air courses parallel the cross entries, generally on the dip side. The entries are driven "water level"; that is, following the undulations of the seams on slightly rising grades, to facilitate transportation and drainage. Rooms are turned off the lifts to the rise on 35- to 60-ft. centers. The coal is won, where the pitch is not too steep and the thickness of the bed permits, by delivering the car at the face with mules or by the gravity method.

## ON MODERATE PITCHES CARS ARE JIGGED TO FACE

The general practice is to use the gravity method in beds of this class, where the pitch varies from 5 to 20 deg. Rooms are driven to the rise and double tracked, the track being placed close to ribs and extended to within about 10 ft. of the room face. Pulleys, from 8 to 12 in. in diameter, are clevised to posts set about 5 ft. in advance of the room tracks. A rope of ample length to provide for room advancement and encircling the pulleys, is attached to the loaded and empty cars. An improvised braking device (see Fig. 15), situated midway between and in line with the pulleys, enables the miner to regulate the speed of the outgoing car, as it pulls the incoming empty to the face. Such a method requires great care in the laying of room tracks, in the setting of pulley timbers and in the use of the rope.

In advancing rooms three lengths of rope are used; these ropes are 150, 250, and 350 ft. long. There are two links in each rope, which are fastened to it by clamps, the surplus rope being thrown on the mine cars; these links are moved along the rope as the room advances. When the room has progressed beyond the point where one length of rope can be used, this length is moved to some other room and a longer one substituted. The ropes are  $\frac{3}{8}$  to  $\frac{1}{2}$  in. in diameter, depending on the pitch.

It has been found that patent brake pulleys are not

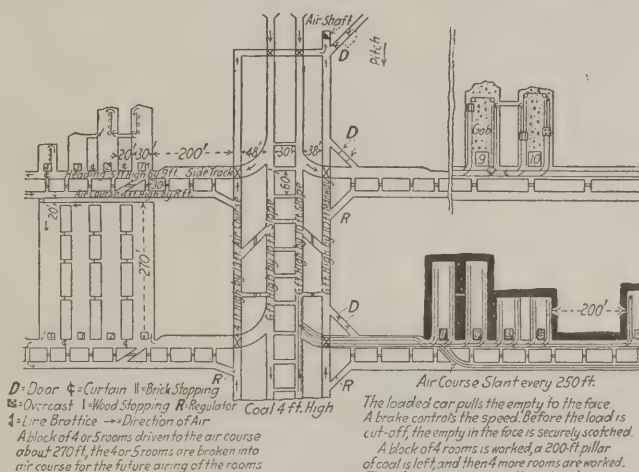


Fig. 14—A Mine in a Bed of Medium Pitch

A slope is driven from the outcrop directly down the pitch. From this levels are turned to either side and double-tracked, double-necked rooms turned up the pitch. Air courses are driven below the levels. Cars are jugged to and from the face.

successful. Sprags are used in the wheels of loaded cars where the pitch is 12 deg. or over. On this pitch wooden room rails are generally used as the damp steel rail does not give enough friction, even though the wheels are spragged.

A modified plan of mining a bed of medium pitch is shown in Fig. 16. The mine is developed through a slope, together with an air course and a manway. Level or strike headings driven double, spaced 700 to 800 ft. apart and averaging about 10 ft. wide, are turned right and left off the slope. Auxiliary slopes, or "dips," are turned off the headings about every 600 ft. The system of mining employed is the room-and-pillar panel plan with all wide work paralleling headings and auxiliary slopes paralleling the main slope. Hoist headings are driven to the rise a distance of 100 to 120 ft. off the headings for the purpose of handling coal from dip panels. Rooms, averaging 24 ft. wide with intervening 20-ft. pillars, are turned right and left off dip slopes and a barrier pillar approximately 40 ft. thick is maintained between the strike entry and the first room turned off dip slopes.

Coal is hauled, by rope, out of dip slopes by an elec-

NOTE—Third part of article entitled "Alabama Coal-Mining Practices," presented at the Birmingham meeting of the American Institute of Mining and Metallurgical Engineers.





Fig. 15—Gravity System or Jig in Operation

Braking is applied to the rope by the extremely simple yet efficient means here shown. The speed of the incoming and outgoing cars may thus be controlled. Sprags in the wheels are also employed if the pitch is sufficiently steep to warrant their use.

tric hoist placed directly in line with them but to the rise from the heading. From main partings in headings, coal is hauled to a side track, and thence up the main hoisting slope to the surface. Coal is undercut with machines in rooms off dips, but solid shooting is used for breaking down coal in all narrow work.

#### LONGWALL MINING PRACTICED TO SOME EXTENT

There are some modifications of this system, but they consist chiefly of semi-longwall operation. The application of this system is the same as that later described as applying to thick seams steeply pitching. Where thin and thick beds are mined on medium pitches, the method used is the same as that described for measures of medium thickness except as to the handling of rock in the thin seams and the depth of rooms in the thin and thick coals.

At one mine in the Cahaba field, a longwall system of mining has been practiced since 1906. This is employed in the Montevallo seam, a typical section of which was shown in Fig. 1, *Coal Age*, Oct. 9, page 474. (This seam is of medium thickness and medium pitch.) This particular mine, Fig. 17, was first developed through a slope on a room-and-pillar system, the rooms being cut together after they were necked and driven up the pitch. This system was continued until the slope had advanced about 2,400 ft. when the mine was changed to the longwall system. After the slope was driven through the basin, which was only 200 ft. wide, the bed began to slope upward on about a 12 deg. pitch, and the walls were advanced on the rise. Electric hoists are used to pull the cars up the pitch. One main hoist raises the empties to a common point of distribution, from which hoists located along the entries leading to the walls pull the cars to the face and drop back the loads. These hoists are equipped with 27½-hp. motors and have a rope speed of 400 ft. per minute.

The walls are 300 ft. in length and have been mined advancing. Experience has proved that if they are kept within 30 to 50 ft. of each other, when the weight comes on it is equalized between them. It has also been found that if the walls are kept 250 ft. part, the falls may be handled on each wall independently. Thus, when the wall farthest advanced gets a fall, it does not affect the coal through which the adjoining wall must be driven. The system of advancing the walls

and the location of the hoists for handling the empties are shown in Fig. 17.

When the walls are driven to the rise, a break occurs every 100 to 150 ft. unless a slip or cleavage line appears in the roof. This naturally brings on a break more quickly. Cover over this mine averages 600 ft.

Cribs are built along roadways and timbers are placed as indicated in Fig. 18. Timbers are set on 4-ft. centers staggered, with 2½ by 4-in. straps. These timbers are 1½ in. in diameter for each linear foot of length and are left in place. If the gob is inadequate, soft-wood cribs (usually of old timber or soft pine) are built behind in staggered position and left in place to serve as a cushion. The performance and condition of the roof determines whether or not the cribs must be built; where slips or cleavages occur, more cribs are required. If the roof has a tendency to fall more quickly than is normally the case, additional cribs must be built to counteract this feature.

#### DOUBLE ROWS OF CRIBBING PROTECT ROADWAYS

Headings are advanced 100 ft. under the coal in the bottom, the measure consisting of alternate coal, rash, and slate. The coal over the heading is then removed as the wall advances. The roadways are protected by cribs set in double rows. The conveyor used along these faces is of the shaker type. This is an English machine, known as the Mavor & Coulson shaker, or the reciprocal longwall conveyor. It is made in sections, each 9 ft. long, which are connected by eyelets and bolts. The motor driving the conveyor is placed be-

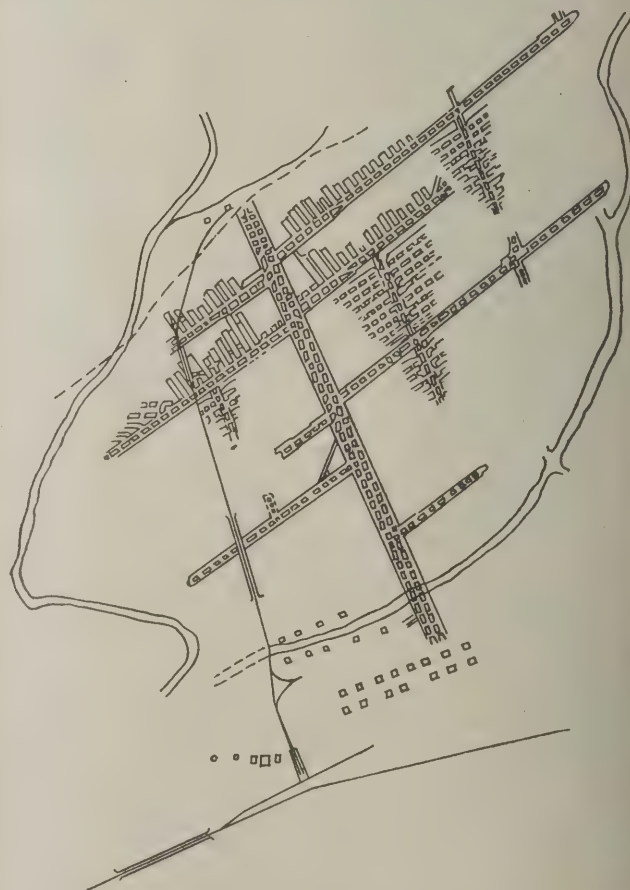


Fig. 16—Modification of Mining Used on Medium Pitches

A slope, an aircourse and a manway are driven down the pitch. Double levels are turned from the slope at intervals of from 700 to 800 ft. Room-and-pillar panel mining with all wide work paralleling the headings and auxiliary slopes paralleling the main slope, is the system followed.



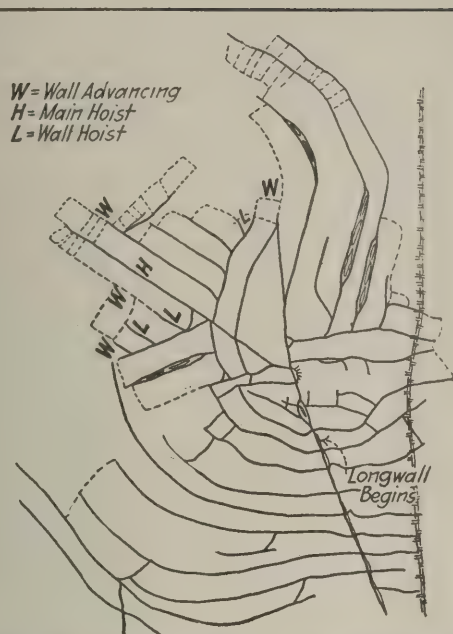


Fig. 17—Longwall Mine in the Cahaba Field

Longwall extraction has been followed in this operation for eighteen years, although the mine was at first developed on the room-and-pillar system. Electric hoists are used underground for car distribution. Operation is conducted advancing.

tween the rows of cribs and is connected to it by means of a rope.

There has been much discussion among engineers as to the proper place for connecting the driving mechanism to this type of shaker. At this mine, experiments to determine the proper location showed that it was more successful to drive the pan from the discharge end. The mining machine cuts its kerf in the rash directly over the bottom coal. Experience has demonstrated that it is most satisfactory under this system of mining to make the length of cutterbar on the machine 1 ft. for every foot of height of coal. In other words, a 4-ft. bed would require a 4-ft. cutter bar.

Coal in this mine is hard, without any butts or faces. With the system of mining described, it yields 67 per cent of lump coal over 4 in. in size, 9 per cent of  $1\frac{1}{2} \times 4$ -in. egg, and 7 per cent of  $\frac{1}{2} \times 1\frac{1}{2}$ -in. furnace nut, or a total of 83 per cent of domestic sizes.

A thick bed, known as the Henry Ellen or Mammoth,

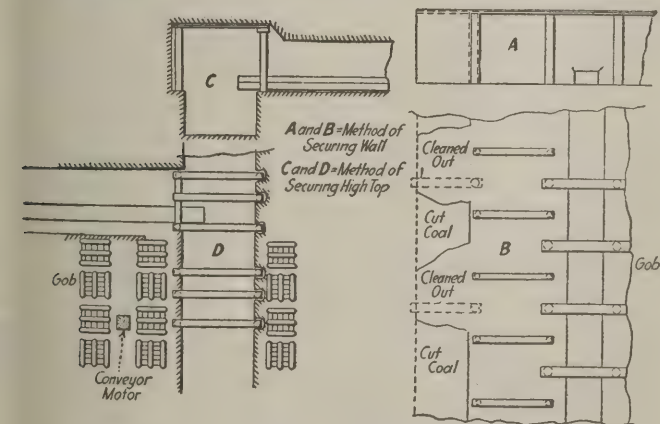


Fig. 18—Details of Longwall Timbering

Props, three-piece sets and cribs are used to support the roof. The cribs are chiefly employed however to ease the roof down. Shaking chutes are utilized to move the coal from the faces or walls to the mine cars. These are motor driven the motor being placed near the discharge end.

in the Cahaba field, is shown in Figs. 19 and 20, which illustrate the method employed in mining steeply pitching measures. This seam is 11 ft. thick with an 18-in. rash parting about the middle of the bed, and 3 to 4 in. of slate parting near the top. The pitch varies according to location along the outcrop and distance from the surface. The bed is steeper near the outcrop and flattens out somewhat as it nears the main faults, or limestone measures. The average pitch is about 26 deg. The seam is worked through a slope driven straight down the pitch with entries or headings driven at about right angles thereto. From these rooms are turned straight up the pitch, as shown. In headings and airways, the coal is loaded directly into cars. Chutes are used in the rooms and cars are loaded from them by opening the chute end gate. The cars are hauled to the sidetrack at the slope by mules and raised to the surface by electric or steam hoists.

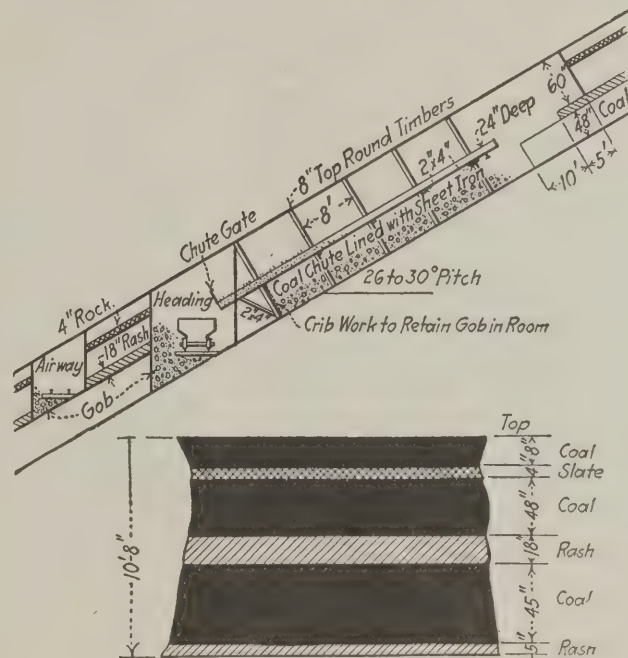


Fig. 19—Working a Thick Steep Bed

This shows a cross-section through an airway, a heading and an advancing room. The coal is here worked in benches, the slate being gobbled in the room and retained by crib work. Chutes lined with sheet iron convey the coal from the face to the heading where a car is loaded by simply raising the chute end- or discharge-gate.

The coal is shot from the solid with permissible explosives. Cutting shots are placed in the center of the working face in the top bench of coal. Slab, or dependent shots, are placed at intervals of 3 to 4 ft. each way toward the ribs. After the top coal has been shot down and loaded out, the middle parting of rock is removed with pick and shovel after which the bottom bench is drilled and shot up with a few light charges placed near the bottom of the bed. The top bench is carried 12 to 15 ft. in advance of the bottom bench in both headings and rooms. This bed gives off a large quantity of methane at the face of the coal, hence an efficient system of ventilation is required.

Ventilation is effected by means of a motor-driven exhaust fan connected to the air shaft by a duct fitted with explosion doors over the shaft. The air intake is through the slope and manway and is conducted throughout the mine on a split system, by means of overcasts, brattices and regulators, constructed of rock, concrete or wood, according to the permanency desired.



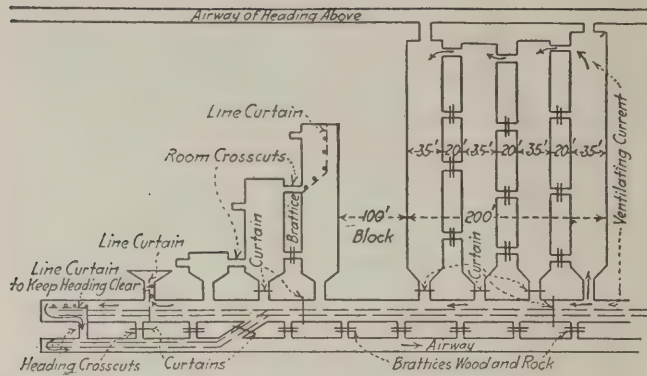


Fig. 20—Plan of Entry and Rooms in Pitching Bed

This also shows how the various working places are ventilated. As gas in fair quantity is frequently encountered it is often necessary to build line brattices or curtains in rooms or headings in order to thoroughly sweep the faces.

At times, it is necessary to use a line brattice or curtain from the last open crosscut (see Fig. 20), to the face of the working place. Electric cap lamps are used in this bed and the coal is brought down by "shot firers" after the men have left the mine. An average miner will load out from 12 to 20 tons of coal per shift.

In medium-thick beds of the third class, the difference in mining method lies in room depth and in handling rock on entries. There are no thin seams of this class mined in the state.

A semi-longwall method of mining has been applied in a few cases to thick steeply pitching beds. Fig. 21 illustrates this method. A slope was driven on the seam which pitched 35 deg. but flattened in the lower workings to about 25 deg. On the first two entries, rooms were turned up the pitch, the coal shot from the solid and loaded through chutes into 3-ton cars. This method was not a success, for the coal was almost completely shattered by the solid shooting. Accordingly, a semi-longwall system was adopted. A section of this seam is shown in Fig. 22. Entries were turned

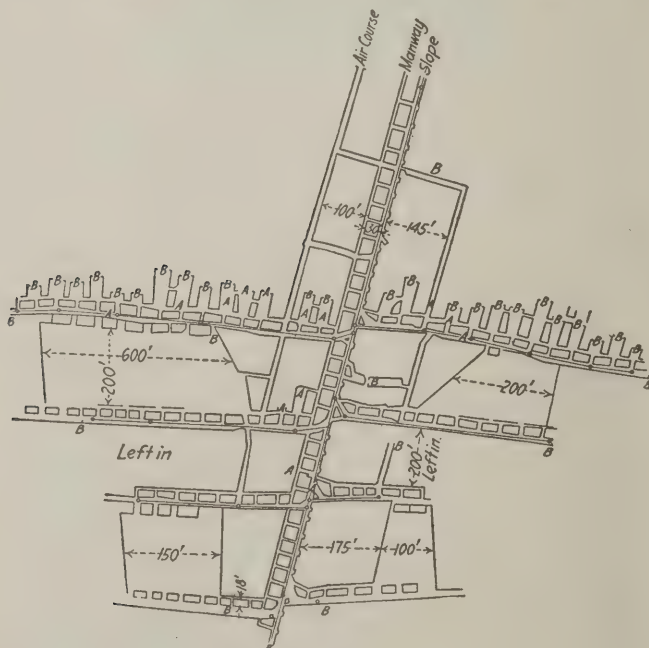


Fig. 21—Semi-Longwall in a Steep, Thick Bed

Room-and-pillar mining was first tried but was not successful. Panel longwall faces were then opened, alternate panels being left in place, the slope and manway in all cases being protected by heavy pillars. This system is more or less of an experiment and difficulty is feared when retreat on the panels left in place is attempted.

so as to provide walls 200 ft. long. Alternate panels are left solid with the idea of advancing with one panel and retreating with the other.

The walls are undercut, beneath the bottom rock, with chain machines of the longwall type fitted with a 5½-ft. cutter bar. These machines cut up the pitch. Each cuts about 100 ft. of face in approximately 2½ to 3 hr. This is about as much as the men can "rock down" in a shift.

In addition to the regular ropes on the machine, there is a safety rope by which it is lowered on the pitch after cutting. This rope is attached to a carefully placed face jack and winds around a drum on the rear of the machine; a friction mechanism attached to this drum is operated by the machine runner. When cutting on a pitch over 25 deg. this rope is kept taut, as a precaution in case the feed rope should break. On pitches of 25 deg. or less, the undercuts in the kerf will hold the machine should the feed rope break.

As the wall advances, ordinary mine timbers about 6 in. in diameter are set about 4 or 5 ft. apart. These are left in place until they begin to show weight, when four rows of large breaking timbers 10 in. in diameter and larger, are set to within 3 or 3½ ft. of the face. Next all the smaller timbers are removed and a break follows. After the first break, it is necessary to timber for additional falls, each time the face advances from 50 to 100 ft. On the lower entry of each wall, pillars 18 ft. wide and 25 ft. long with 10-ft. crosscuts are left to protect the entry. When the wall advances beyond a crosscut, the chutes are curved into the last one left open. The coal is loaded into the chute by the miner and flows by gravity into mine cars.

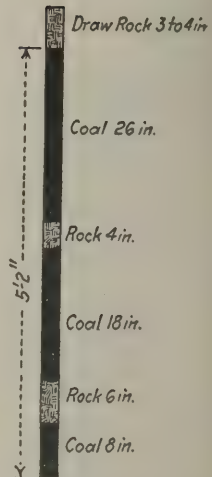


FIG. 22  
Section of Coal Bed

This is a section of the coal in the mine shown in Fig. 21. It exhibits the partings characteristic of Alabama measures.

Table VII—Output per Man per Day, Tons

Thickness of Coal, inches	Average Production per Man, Tons
28-30 (machine mined)	2.16
36 (machine mined)	3.90
44 (machine mined)	4.35
84 (solid shooting)	4.65
42 (steam shovel)	8.57

This system may, with conservatism, be said to be in an experimental stage. The operator anticipates some difficulty while retreating on the alternate panels. It is planned to drive "raises" through these panels at a distance of 1,000 ft. apart. Then, if trouble develops while retreating, a wall will be advanced from a "raise" toward the face. This system is used on medium-thickness beds of medium pitch. Where the pitch is under 18 deg., the chute is replaced with a conveyor, which consists, in most cases of a chain traveling in a trough. The movement of the chain is sufficient to bring the coal to the mine car on the entry.

As an indication of the influence of the thickness of bed on the average production per man, including company men, Table VII is submitted; these figures have been compiled by a large producing company and cover several months' operation.



# Conveyor That Facilitates Concentrated Mining

Adequate Transportation Necessary to Obtain Output from Any Mine—Flexible Sectional Conveyor Makes This Possible—Ability Quickly to Lengthen or Shorten Such a Machine Is a Primary Requisite

BY N. D. LEVIN  
Columbus, Ohio

**T**RANSPORTATION within the mine is one process in coal production that causes much delay and loss to both mine owners and workmen. In many cases the men have to wait half or more of their time for cars in which to load, when they would far rather be working and making money. With the ordinary room-and-pillar system no more than one or at most two men can work in each room; consequently a great number of rooms are required in order to obtain the desired output. This means a correspondingly large investment if the mine covers an extensive territory.

The Jeffrey Manufacturing Co., of Columbus, Ohio,

The rivets take no more stress than that required to hold the chain together; the shear is taken by the lugs on the side straps. This is the strongest chain for its weight that has yet been devised.

The single chain positioned in the center of the trough is easy to get at for connecting or disconnecting. When it is desired to add a section to the conveyor the procedure is as follows: The chain is disconnected near the tail end of the conveyor, and laid out on the floor back of the conveyor, as shown in Fig. 3. The sections are held together by bolts or by pins, as shown in Fig. 4.

There is a connection on both sides at each end of



Fig. 1—Conveyor Tail Section Detached

Particular attention should be directed to the type of chain employed. Placing lugs on the side links relieves the rivet or pin from the stress of pulling the chain.

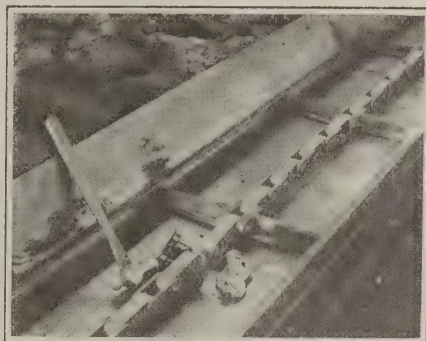


Fig. 2—Details of Chain Construction

Here the side links with their forged lugs readily can be seen as well as the grooved pins and the locking device. A hammer is used for disconnecting the chain.

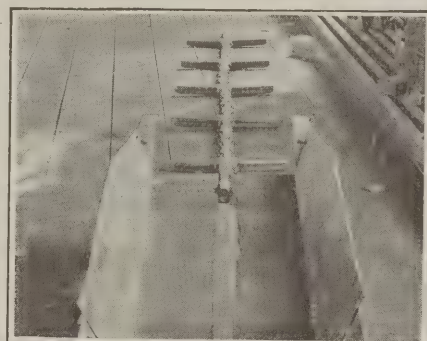


Fig. 3—Inserting a Conveyor Section

When it is desired to lengthen the conveyor the first step is the disconnection of the chain. The loose end is next straightened out in line with the conveyor.

recently developed a type of conveyor that makes concentrated mining possible under many and varied conditions. One of these machines and some of its applications are described in this article. This conveyor is so constructed that it can be lengthened or shortened quickly. The standard sections are made 6 ft. long, as this is the average advance of an undercutting machine. If, for instance, the conveyor is used to take the coal away from a "shortwall loader" that makes, say, one advance per hour, the machine must be lengthened eight times in a shift.

It accordingly is evident that each extension must be accomplished quickly and easily or otherwise too much time would be lost, and the delay incurred would offset any advantage derived from the use of the machine. In designing this conveyor, therefore, aside from reliability and the lowest possible cost, the ability to attach or detach a section quickly was given first consideration.

It is evident that it will require less time to uncouple one chain than two; consequently this conveyor was made with a single strand of chain. The coupling links shown in the accompanying illustrations can be taken out or put in place in an instant.

The chain is built up of forged side straps, the same type as is employed in coal-cutting machines.

every section. The pin or bolt—whichever is used—first is pulled out; then the tail section is drawn back 6 ft. In Fig. 5 two men are shown taking hold of his tail section to move it back. It is light enough so that two men can easily carry it, or, if necessary, one man can drag it.

The lower trough or pan is put in place first, after which the upper trough is added. Fig. 6 shows a man in the act of putting the upper half of the section in position. After this is done the four pins are put in place to hold the conveyor together. Next 12 ft. of chain is added and coupled to place. All parts of the conveyor are light, so that one man can do the work if necessary, but two men can perform it easily.

The bottom of the upper trough on which the coal rides is only 3 in. above the floor of the mine, so that this conveyor is extremely low. This is of great importance when working in low coal. Another feature of the conveyor is that it readily adapts itself to rolling bottom.

Fig. 7 is a shop view of one of these conveyors with 12-in. wooden blocking placed underneath a section joint. This makes more of a sudden hump than would be encountered in a mine, yet the machine will carry coal over this obstruction.

Fig. 8 is a view of the conveyor taken from the dis-





**Fig. 4—Disconnecting Tail Section**

The tail or rear terminal section may be disconnected by withdrawing the pins or bolts that join it to the conveyor proper, thus completely freeing it.

charge end. The size of the electrical equipment shown on the left is varied to suit the length of the conveyor and the duty it will be called upon to perform. Fig. 9 is a view looking toward the discharge end, and Fig. 10 shows the tail section by itself. This is the part that ordinarily is moved back when a straight section is to be added. On the right-hand side is shown a small wheel, in the circumference of which radial holes have been drilled. These are used for slackening the chain when it is to be disconnected. A slight pull on a bar inserted in one of these holes will give sufficient slack to couple or uncouple the chain quickly.

The conveyor is reversible, this provision being necessary inasmuch as no track is laid in the entries or rooms where this machine is used, and consequently timber and other material must be handled by the conveyor.

By reference to Fig. 12 a good idea may be obtained



**Fig. 6—Inserting a Straight Section**

Top and bottom pans are moved separately, the bottom pan being put in place first. Either is light enough as to be readily handled by one man. This is a decided advantage in restricted mine passages or where speed in making a change is essential.

of the way in which this conveyor is used. A "short-wall loader" is shown at A. The sectional conveyor carries the coal from this machine and discharges it at the point B, either into cars or onto a conveyor on the lateral entry as shown. At the face C is a "conveyor loader" which discharges into another sectional conveyor at D. This latter conveyor carries the coal to the point E. The driving units for these conveyors are located at B and E respectively. Each time the face C is loaded out, the conveyor is shortened at D. The sections removed are loaded out on the conveyor to E, transferred to the conveyor serving the "shortwall loader" and are used for adding on to this conveyor at the point A.

When the shortwall loader has driven through to the next lateral entry at the point K, the conveyor is not taken out, but is left in place. The head and tail ends are removed and their positions reversed. Thus the



**FIG. 5**

#### **Moving Tail Section Back**

Lightness is an essential characteristic of any portable conveyor. The tail section of this machine is of such small weight that two men can easily carry it or one man can drag it along the mine floor. As may be seen in this illustration, hand holds are provided to facilitate moving this section. Little time is consumed in lengthening this conveyor.





FIG. 7  
Uneven Floor  
Is No  
Obstacle

Humps and hollows make little difference to this conveyor as it is sufficiently flexible to surmount them. A joint is here supported on two 6x6-in. blocks.

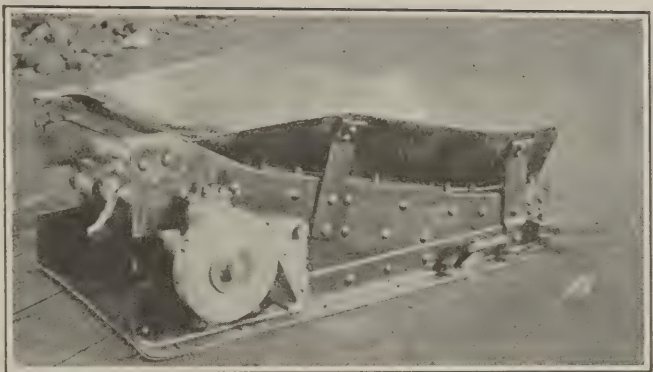


Fig. 10—Tail Section of Conveyor

The tail shaft is provided with an overhung disk with holes drilled radially in its circumference. This affords enough slack to permit of coupling or uncoupling the chain.

end that was nearest to the "shortwall loader" is placed at *B* and the driving or discharge end is put at the point *K*. When the face *C* has advanced to the point *E*, the conveyor is ready to receive the coal from this face and transport it to the point *K*. The same type

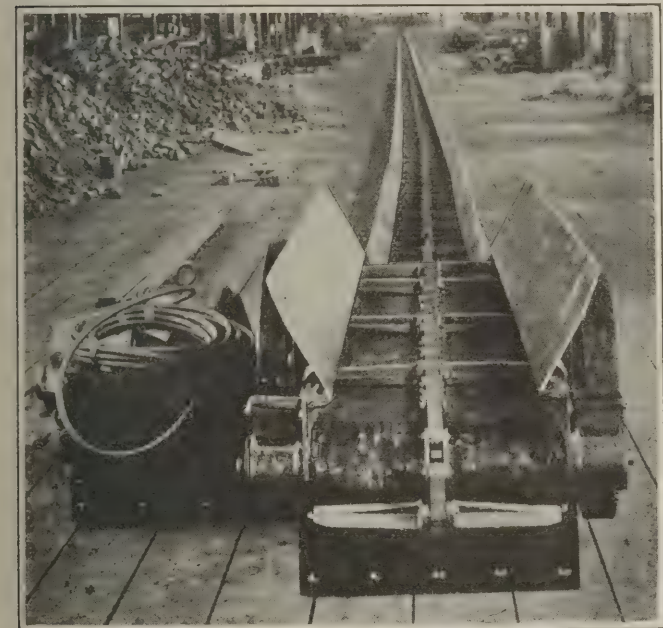


Fig. 8—View as Seen from Head End

The motor and driving machinery are well incased. The power of the motor may be varied to suit the work to be done or the weight of coal to be transported.

of conveyor, if desired, can be used along the face *C* instead of the "conveyor loader," the coal being loaded into it by hand. This latter method requires putting enough men along the face to load out a cut in one shift.

In mines where it is desirable to maintain the present room-and-pillar system the rooms may be driven

narrow, using a "shortwall loader" discharging to a sectional conveyor. When the rooms have been driven to their full depth slabbing cuts are made by mining machines and the coal loaded into the sectional conveyor.

In Fig. 11 is shown a room being driven 10 ft. wide with a shortwall loader, *A*. *B* is a sectional conveyor. To the right is shown a room that has been driven to its full depth. A shortwall machine is shown at *C* making a slabbing cut. *D* is the sectional conveyor that took the coal away from the shortwall loader when the narrow room was being driven and is now in position to be used for taking away coal made by the slabbing cut. *E* is a conveyor installed on the entry and em-

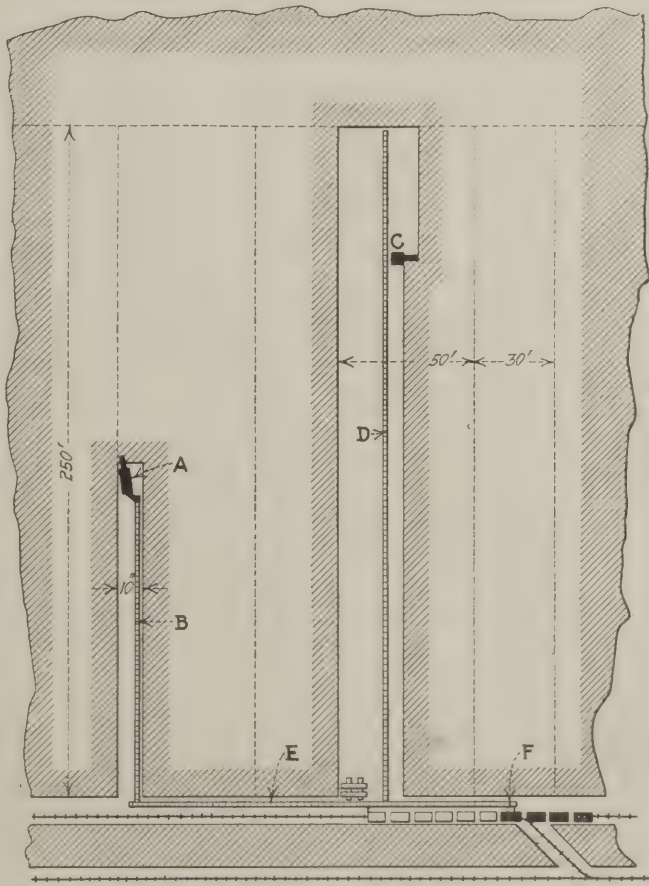


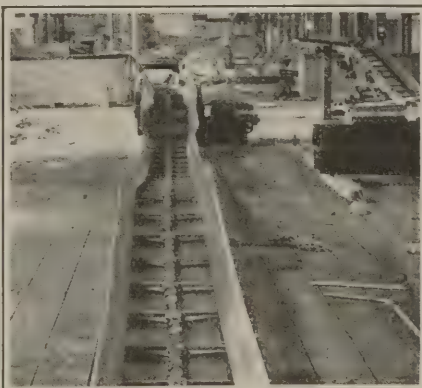
Fig. 11—Room Driving and Pillar Slabbing

The rooms are driven narrow and then widened out by slabbing cuts taken off the pillar ribs. Cars are loaded in trips on the heading, where unless grades are favorable each locomotive remains with its trip, successively spotting the cars until the entire trip is loaded.

FIG. 9

Looking  
Toward the  
Head End

Although the bottom plate of the coal pan is only 3 in. above the floor, making the complete conveyor low, its capacity is large, as may be judged from this view.





ployed in gathering coal from several rooms and discharging it into a trip of cars at *F*. This conveyor may be extended to the nearest entry if desired.

Many different systems of mining by mechanical means are being contemplated at the present time, and it is believed that this sectional conveyor will find a place in practically all of them. A saving will be afforded by its use because of the comparatively large quantity of coal that can be taken from a territory of given size. This will result in a lower cost of mine upkeep. No track is required where the conveyor is employed, and it is not necessary to take up bottom, shoot down top or remove rock in the entries in order to make room for cars.

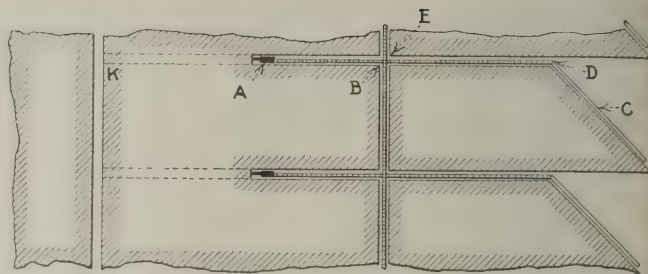


Fig. 12—Concentrated Mining by Conveyors

Both heading driving and pillar withdrawal are here shown. The method is thus rapid and the output large. Cars are loaded at a single point on a heading not shown in this drawing. Unless grades are favorable the locomotive does not uncouple from the trip.

## Alberta Experiments in Making Briquets From Coal Dust Hitherto Wasted

In the fourth annual report of the Scientific and Industrial Research Council of the Province of Alberta is found a detailed account of experiments in the manufacture of briquets from the fine coal dust usually wasted in the production of coal in Alberta. This work has been carried on at the University of Alberta since December, 1922, and Prof. Edgar Stansfield, secretary of the Council, in describing it and in outlining the conclusions reached says:

"In making briquets the coal is crushed to a suitable size, if dust is not used. A batch is then weighed out, transferred to the mixer, and heated. Usually, in our test plant, 18 lb. of coal is handled in one run. The binder also is weighed out, melted and poured into the mixer, and the temperature and moisture content of the mixture regulated as required. Usually two or three minutes is found to be sufficient time to complete the mixing, but this varies with the temperature and therefore with the fluidity of the mix.

"From the mixer the batch is transferred to a fluxer, from which it is allowed to run into the feed hopper of the press. As the rear plunger is drawn back, some of the material in the hopper falls into the die box. Here it is caught, squeezed between the two plungers, and finally ejected from the die box by the rear plunger, which has a longer travel than the front one and makes only half as many strokes per minute. The briquets fall onto a moving belt, are discharged at the front, collected in a box, and tested.

### TWENTY-FIVE BRIQUETS MADE PER MINUTE

"The press makes about twenty-five briquets per minute. Their size can be controlled by a regulation of the feed, but they usually were made to weigh about 4 oz.

"The briquets are classified by inspection, by their specific gravity, by drop test, and by rattler test. Of these, the specific-gravity and the rattler test seem to be the most satisfactory. Comparison of briquets made from the same coal with the same binder show that the quality of the briquet increases with the specific gravity.

"In the drop test, six briquets are given a 10-ft. drop onto a concrete floor, and the breakage determined. In the rattler test twenty briquets are placed in a container, which is revolved 200 times at 32 r.p.m. The material rubbed off the briquets as they revolve is then weighed, and the percentage determined.

"Tests were made to determine the best sizing of

the coal, best temperature for mixing, minimum time required for mixing, best temperature for pressing, also the effect of the addition of steam to the mix, and changes of pressure in the press.

### SOFT COAL-TAR PITCH USED IN TEST WORK

"Soft coal-tar pitch was used for most of these tests for the sake of uniformity and because it is in some ways the easiest binder to use for test work. Comparative tests were made with other binders. While we are not prepared at present to tabulate full results of our experiments, certain broad conclusions may be mentioned.

"The quantity of binder required varies with the type of coal. Thus, a carbonized lignite requires from two to three times as much as a coking bituminous coal.

"The higher the temperature, the less time required for mixing.

"Although blowing steam through the mix has advantages and is generally employed in commercial work a better briquet generally can be made under laboratory conditions without steam.

"Increase of temperature at the press results in increase of density of the briquet, but a limit is placed upon the temperature by the increasing tendency to stick to the plunger and by the friability of a hot briquet as it leaves the press. The tendency to stick to the plunger can be reduced by steam.

### SIZE OF PARTICLES AFFECTS QUALITY OF BRIQUET

"Increase of pressure naturally increases the density of the product, but a large increase in pressure is required for a small increase in density.

"The effect of the size of particles in the crushed coal used on the quality of the briquet made probably is far less in a coking bituminous coal than it is with either anthracite or carbonized lignite. If the particles are too large or large particles are present in too great quantity, the briquet is coarse and friable. Finer crushing gives a smoother and more shiny briquet, but excessive dust increases the amount of binder required.

"The department does not intend to continue the manufacture of briquets this autumn," concluded Professor Stansfield, "but more attention will be paid to suitable binders for the various grades of coal. Whether our results will form a basis of a future industry for northern Alberta depends on so many factors that we can say nothing about it. We are concerned only with the scientific side of the problem and not its commercial application."



# Kentucky Chief Electricians Learn How To Cut Costs

Men of Ten Related Companies Hold Round-Table  
Session at Williamsburg Reviewing Money  
Saving Methods

BY J. H. EDWARDS  
Associate Editor, *Coal Age*,  
Huntington, W. Va.

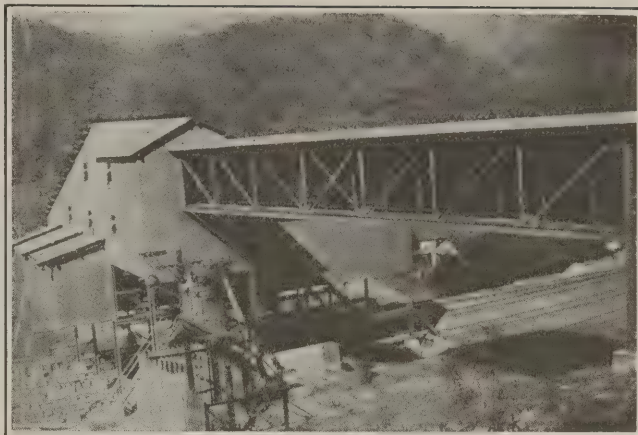
METHODS that have already cut power costs and are expected to cut them deeper were discussed in round-table session by the chief electricians of the Southern Mining Co. and nine related mining organizations at Williamsburg, Ky., Sept. 25-27. The electrical men sat around a table, elbow to elbow with their superintendents, some foremen, a scattering of company officials and equipment salesman, and went vigorously at the heart of many a problem that worries coal mining men. This gathering in of men from various departments was a new plan.

They discussed differences in efficiency between new and old locomotives and how to get the best out of such motors. They developed the fact that the life of bearings can be doubled and the cost of lubrication halved by shifting from cheap black oil to good, high-viscosity lubricants. They learned that cutter chains oiled when hot deliver better service. They were convinced of the value of setting cutter bits with exactness. They described various new practices they have adopted, and produced the figures to show that the sort of study they are making in their round-table meetings pays. One of the companies, since the last meeting, reduced its electrical department costs 9 cents per ton. Many cuts in power cost per ton have been made.

There were represented at the meeting 12 properties with an aggregate output of 14,000 tons per day and operated by ten associated companies. F. A. Signer, electrical engineer for the entire group, presided at all sessions. The registered total attendance was eighty. The meeting was conducted informally where men smoked and speakers were not required to stand.

An especially interesting part of the program was the reading of reports including comparative figures of electrical department costs for this year and for the period since the first meeting at which each electrical man pledged himself to find ways to reduce costs.

In the electrical department costs of the Southern and associated companies are included: purchased power, supplies for electrical and mechanical equipment, trolley wire, line material, armature repairs, repair depart-



New Steel Tippie at Black Snake, Ky.

The first coal wast just recently loaded from this tippie at the Southern Mining Co.'s new operation. A flight conveyor moves the coal from the monitor dump to the tippie. The eight tippie motors are supplied with alternating current from the transformers in the foreground.

ment labor, and the like. Table I is a summary of the results obtained. Reductions up to 9 cents per ton were made. The few cases of small increases in cost were generally due to reasons beyond the control of the chief electricians. It will be noted that the table includes power costs per ton. The average cost per kw.-hr. of purchased power for this group of mines is 2½ cents.

## MANY INTERESTING PAPERS WERE PRESENTED

At intervals between informal discussions, papers were read by each chief electrician. These included the following: "Economy of Automatic Substation Installation," by G. L. Birch, Southern Mining Co., Balkan, Ky.; "System Employed in Maintenance of Storage Battery Locomotives," by Jonas Jones, Southern Mining Co., Colmar, Ky.; "System Employed in Case of Haulage Locomotives and Mining Machines," by H. A. Sparks, Harlan Coal Co., Perkins, Ky.; "Performance and Repairing of CE-10 Mining Machines," by Gail Benge, Mahan-Ellison Coal Corporation; "Tippie Equipment General Remote Control," by Bryan Harkness, Southern Mining Co., Black Snake, Ky.

Mr. Birch's paper described the layout and performance of an automatic substation put into use April 23 of this year. Up to the present he has had only four trouble calls to this equipment. Twice the automatic apparatus was merely performing its duty in refusing to go on the line because of short circuits inside the mine. The other two times failure was found due to dust on control contacts. Mr. Birch suggested eliminating this trouble by inclosing the contacts.

The important subject of lubrication as influencing electrical department costs was approached, as were many other subjects, by calling on each chief electrician for a verbal report of the service he obtains and his suggestions for improvement. At one mine a 50 per cent cut in lubrication cost was reported. This was made possible by going to the carefully supervised use of good grade, high viscosity lubricants instead of the cheaper oils and greases. It was estimated that double the bearing life is now being obtained. The necessity for applying the lubricant to a mining machine cutter chain after completing a cut rather than before starting a shift was emphasized. If applied when the chain is warm the lubricant works in along the rivets where it is needed the most.

Mr. Sale explained that three-fourths of a pint of

Table I—Per Ton Costs Are Improving

Operation	Electrical Dept. Costs 7 months of			Power Only	
	1923	1924	Reductions	1923	1924
No. 1.....	.100	.071	.029	.040	.047
No. 2.....	.131	.123	.008	.091	.096
No. 3.....	.118	.123	.005	.048	.044
No. 4.....	.091	.070	.021	.039	.042
No. 5.....	.126	.131	.005	.099	.105
No. 6.....	.104	.079	.025	.052	.050
No. 7.....	.254	.161	.083	.099	.096
No. 8.....	.....	.189	.....	.....	.175
No. 9.....	.148	.139	.010	.....	.....
No. 10.....	.....	.108	.....	.....	.....
No. 11.....	.055	.057	.....	.055	.048

This table shows the results of close studies of power problems by the Southern Mining Co., and eight related companies in Kentucky. Electrical department costs including purchased power, parts and supplies, wire and line material, repair labor, etc., have been cut as much as 9 cents per ton. Power costs per ton show some reductions also.





"On Top of the Hill" at Black Snake

The two trolleys are supported by one row of heavy posts. A large bracket and a  $\frac{1}{2}$ -in. rod support the  $1\frac{1}{2}$ -in. galvanized pipe. The same posts support a telephone and low voltage a.c. line.

proper lubricant if applied properly is sufficient for the cutter chain during an entire shift. It is preferred to apply the oil in two doses, one after the first cut and the other during the middle of the shift, however, in some cases satisfaction is obtained by only one application per shift. Mr. Sale exhibited curves of amperage, first when using black oil on the cutter chain and later when using a good lubricant. In the first case the load was 135 amperes and in the second case 100 amperes. Mr. Signer also emphasized the poor lubrication by black oil, citing tests he had made where the load on a mining machine motor was reduced from 27 hp. to 21 hp. by discontinuing the use of black oil and substituting the use of a high grade lubricant.

Black oil will not adhere to the chain. If the chain is well oiled before beginning a cut there will be an increase of about 3 hp. before the cut is finished, most of this increase being due to decreased lubrication. Joe Gider described a comparative test during the past two years on two cutter chains, one being lubricated by black oil and the other by a high grade liquid grease. A recent inspection of the chains revealed that the first is nearly worn out, but the other is still in excellent condition. The use of a special gear compound rather than heavy grease was indorsed for locomotive gears.

Next in order was a discussion of arc weld bonds. The steel terminal bond applied with a mild steel  $\frac{1}{2}$ -in. diameter metallic electrode is the standard of the companies. The terminal is applied at the apex of the angle between the base and web of the rail and welded only along the top and end. The bonds are always put on the inside of the rails in which position the flanges of derailed equipment will not cut them off.

The same size and type of steel terminal is used on the cross-bonds; however, the terminal is turned upside down and its length placed at right angles to the length of the rail. It is welded along both sides to the top of the base of the rail. With the cross-bond terminal in this position a 90-deg. bend in the copper cable is avoided thus saving several inches in length of bond required and there is provided the required offset of the copper below the top of the ties thus affording protection. The breaking of a few rails at the point of bond application was reported but no one present emphasized this feature as being a serious objection.

The discussion of trolley wire installations and mine circuits in general was quite spirited. The importance of applying hangers or suspensions at intervals of not over 20 ft. and of aligning the trolley wire properly

with regard to the track was illustrated. A straight properly located wire means less strain and wear on the trolley wheels, harps and suspensions, also a great saving in time consumed by putting poles back on the wire. The waste of using several hangers screwed together one above the other at points of high roof was condemned. Mr. Birch exhibited graphic meter charts taken before and after a general repairing and reinforcing of bonding and feeders. These comparative charts indicated clearly the power saving achieved.

Following this came the subject of inspection of equipment in service. A point stressed is the necessity for effort in persuading the mining machine operators always to use a gage in setting machine cutter bits. A method of checking the care used by the machine operator is to gage a few of the dull bits he leaves at the shop. The bright marks indicate the last set screw position, this giving a point from which to measure.

In the discussion of substation maintenance the cases were cited of two fires being started by an accumulation of dust on top of the oil switches. One of the most important items of converter and motor-generator inspection brought out at the meeting is that brushes should never be allowed to get stuck in the holders.

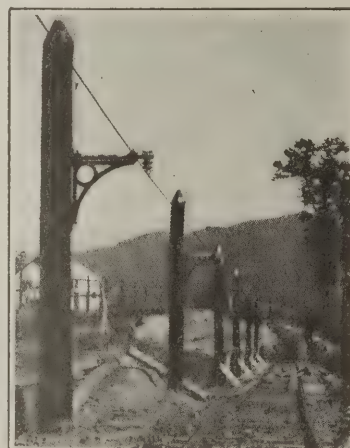
In a discussion of locomotive and mining machine cables it was held that the braided type of cable lasts an average of ten months at these mines. The all-rubber cables are very much favored. The cost is about two and one-fourth times that of the braided but the life is three to five times as great.

Outside frame locomotives were favored by most of those present for use where clearance inside the mine permits. The outside frame type is inherently better than the type carried on an inside frame although, of course, it is more expensive when renewing tires. The difficulty of re-railing a wheel is overcome to a great extent in the latest locomotives by designs which afford 5 to 10-in. clearance between the bottom of the frame and the track.

One great advantage of the outside frame locomotive lies in its better journal bearings. Dirt and grit are excluded from at least one end of the bearing and the end thrust can be taken on a quickly renewed plate on the end of the shaft. The bearing is out where it can be lubricated and inspected easily. The added room between frames of the outside type is a valuable feature

where narrow gages would otherwise tend to cramp the equipment and limit the cab space so necessary in low coal where the motorman must get down almost level with the top of the locomotive.

The difficulty often experienced in getting full tractive effort out of new or newly re-tired locomotives was referred to by some. It requires the wear of about  $\frac{1}{8}$  in. of metal off of the properly tapered tread before full tractive effort is exerted. The Kentuckians find this wear takes place in



New Construction

The same standard bracket is used regardless of the length of arm. Pole extension above the bracket provides support for future wiring.





**Trolley Supports in Perfect Alignment**

This is one of the many photographs used at the meeting in connection with the discussion of trolley wire installation.

a few days or weeks depending on the service. It was suggested that possibly the tires should be furnished

with a flatter tread contour when first put in place.

A report was made on the performance of a 13-ton locomotive equipped with contactor control. Little or no trouble was experienced and it was agreed that the maintenance is less than with the drum control.

This meeting of chief electricians was not lacking in entertainment. One feature was a get-together dinner. Here good fellowship prevailed and serious thoughts of speakers were clothed and intermingled with wit and humor. The dinner was attended by most of the officials of the associated companies. The character of the whole gathering from start to finish was such as to make it impressive to those who attended. It is confidently expected that when the next session is held additional dollars and cents results will be reported from better electrical department methods suggested at this round table and more hearty co-operation between electrical and mining departments.

## Mining Congress Discusses Coal Situation At Sacramento Convention

**M**OST OF THE papers presented at the American Mining Congress convention held at Sacramento from Sept. 29 to Oct. 4, dealt with metal mining. However, there developed some interesting discussions on the coal situation.

Senator Oddie of Nevada, in discussing the needs of the mining industry, advocated the encouragement of seasonal buying and did not agree with the recommendation that the problems of the coal industry should be referred to the Interstate Commerce Commission for solution.

Falcon Joslin, of Seattle, explained the Alaskan situation and told of the difficulties experienced by those who had attempted to develop coal and petroleum prospects in Alaska. He said that Alaskans wanted laws that will stabilize property rights in mineral holdings and a system of government that protects capital and investments.

The needs of the coal mining industry were briefly outlined by S. Pemberton Hutchinson, president of the National Coal Association. His address in part was as follows:

### NEED OF COAL INDUSTRY IS TO BE LET ALONE

"The only need of the industry today is to be let alone to work out its own salvation. Over development, coupled with a somewhat depressed industrial situation, is usually given as the reason why there have recently been so many idle coal miners.

"Of course there is some over development for normal needs, caused by the unprecedented demands for coal during the war. This industry, as well as all other industries, cannot and should not attempt to support more men than are needed to meet the demand in normal times. Those mines that are today working the greatest percentage of full time are naturally those which can produce coal at the lowest cost. The situation in the industry is already improving and will continue to improve with a general resumption of industrial activity.

"It is often said that the stabilizing of production is the great need of the coal industry. By that is meant, I suppose, that the consumer shall buy an equal amount of coal each month. I do not believe that such

a plan is practicable. There is no power to compel the consumer to buy coal when he thinks he does not need it. Lack of storage space, uncertainty as to the future of his business, and consequently of his needs, will always be governing factors in the consumer's mind.

"Some advocate regular production and storage at the source of supply, but any one who is at all familiar with bituminous coal production knows that this is utterly impracticable for physical reasons at many mines, since they are in narrow valleys where storage space is not available. Furthermore, there is the cost of rehandling with a certain loss in volume and a greater loss through degradation as well as loss in interest on the money advanced by the producer to cover the storage period.

### STORAGE ONLY ADDS TO CONGESTION

"If the operator stores coal, with the consequent cost thereof, he must surely face the day when his stored and weather-beaten coal goes into competition with his freshly mined product. Those who advocate storage of coal at the mines in order to provide against a possible shortage during strikes or severe weather apparently forget that shortages have been largely caused by lack of transportation facilities. Storage wherever it involves reloading on railroad cars affords no relief from this difficulty, but rather slows down traffic and adds to congestion.

"Taking it by and large, over the long period of years since bituminous coal was first mined, the consumer has been able to secure an uninterrupted supply of coal at the pit mouth at a reasonable price. Private ownership and competition have effected this. Will government regulation do any better? I challenge the advocates of any form of paternalism to prove their case.

"The regulation of the bituminous coal industry can safely be left to economic forces. Attempts to stabilize production or buying can at best be only partially successful.

"There are certain hard facts as old as mankind which must be recognized. The bituminous coal industry is up against them and it must work out its own problems. That is the same thing as saying that the solution is economic, and other industries are faced with the same situation."



## Concrete-Lined Pipes Resist Acidulous Mine Water

Lining Is Spun to Place and Requires No Puddling—  
Tests Prove Impermeability and Strong  
Adhesion to Metal

By C. H. S. TUPHOLME  
London, England

**O**WING to the deleterious action of mine and other acidulous waters on metal pipes, and the incrustation and corrosion which occurs from this cause, an allowance in the size of the bore of the pipe has usually been necessary in order to secure the desired effective carrying capacity of the line. This allowance has been estimated by some engineers to be as high as 40 per cent. Various corrosion-resisting metals have been developed and used in the construction of pipes intended to carry acidulous waters. Most of these, however, have proved impracticable chiefly on account of their high cost.

The recent introduction, into Britain by the Stanton Ironworks Co., of a centrifugal method for making both iron and concrete pipes, is claimed by some disinterested parties to have provided a solution to this problem. By this method also it is possible to line a metal pipe with concrete, thus forming on its inner surface a corrosion-resistant coating.

In this process special runners are fitted to the external surface of the metal pipe that is to be lined. This pipe is then placed on the Stanton-Hume concrete machine and a concrete lining run to place on the inner surface in a manner similar to that employed in the manufacture of concrete pipes.

### CONCRETE PIPE SPUN TO SHAPE WITHIN MOLD

The machine employed in making concrete pipes consists of a cylindrical mold, cut longitudinally, the edges being rejoined by keys. At the ends of the mold, the internal diameter of which equals the external diameter of the pipe to be made, flanges are fixed. The difference between the internal diameter of these flanges and the inner diameter of the mold determines the thickness of the wall of the pipe to be made. Incidentally these flanges serve as wheels upon which the mold is rotated when placed horizontally upon the machine with the flanges bearing against friction rollers. While the mold is revolving at low speed the necessary amount of concrete is inserted, and spreads itself over the inner surface. The speed of rotation is then increased. After a few minutes the mold is brought to rest and the water, which by action of centrifugal force, has been squeezed out of the concrete, is allowed to run off. About 7 per cent of water is left behind in the body of the pipe.

The machine is again started and the pipe once more rotated for a few minutes. During this final spin the inner surface of the pipe is polished by passing a steel bar over it.

Pipes thus formed are lifted from the machines hydraulically after which they are passed successively through chambers containing a saturated atmosphere. They are next placed in the curing yard, kept well watered while in the early stages of setting, and the conditions for curing maintained as nearly as possible to ideal for several weeks.

Lining a metal pipe is performed in exactly the same manner as above described except that the pipe itself takes the place of the split mold. Either cast or wrought pipes may be lined with equal facility in this manner.

In testing the adhesion of the concrete to the metal a 27-in. cast-iron pipe with a  $\frac{1}{2}$ -in. lining was used. A hole was drilled through the iron only, just touching the outer surface of the concrete lining. This was then tapped and connected to a pump. Pressure was gradually applied until it reached 560 lb. per square inch. This pressure was maintained constant for a period of 10 min. during which time the pipe was kept under continuous observation. At the end of this interval moisture was seen coming through the concrete lining at a point opposite that at which the pressure was applied. The pressure was then increased to 1,120 lb. per square inch, when moisture appeared on parallel circumferential arcs 2 ft. long and 12 $\frac{1}{2}$  and 15 in. respectively from the point of pressure application. This concluded the test.

This trial clearly demonstrated the impermeability of the lining. The layer of dense concrete on the inside of the lining is the portion that is impervious to water at reasonable working pressures. By a "reasonable working pressure" is meant one at least 50 to 75 per cent above the working pressure that the pipe is designed to withstand.

### TEMPERATURE CHANGES HAVE LITTLE EFFECT

Atmospheric temperatures have no apparent effect on concrete-lined pipes. The coefficient of expansion of cast iron is only slightly higher than that of concrete (0.000011 as against 0.0000106), and although the conductivity of the metal is much higher than that of the concrete, the rate of change of temperature is so slow that no separation of the metal and concrete can take place. To demonstrate this fact the following experiment was performed:

Four concrete-lined iron pipes were successively subjected to temperatures of 80, 90, 100 and 200 deg. F., with no separation between metal and lining occurring. In order to make this test as severe as possible the pipes were rolled direct from the heating chamber into the cold air and vice versa. The pipes were left for 7 hr. at each of the higher temperatures and intermittently for 5 hr. at atmospheric temperatures ranging from 48 to 62 deg. F. In order to ascertain if any separation between lining and metal had taken place in the body of the pipe, sections were cut off from time to time and inspected.

In a freezing test a 12-in. ring cut from a 27-in. cast-iron pipe lined with  $\frac{1}{2}$  in. of concrete was sent to a refrigeration plant and left in a freezing chamber at 1 deg. F. for 24 hr. This also had no effect on the lining.

In another test two concrete-lined iron pipes were joined and caked, after which the following loads were applied:

Load, tons	Deflection, inches
0.5 .....	0.011
1.0 .....	0.019
1.25 .....	0.025
1.50 .....	0.030
1.75 .....	0.040
2.00 .....	0.101
2.25 .....	0.161
2.50 .....	0.214
2.75 .....	0.272
3.00 .....	0.315
6.5 .....	1 $\frac{1}{2}$ approx.



The sections joined were finally deflected 17 deg. from a straight line yet no sign of damage appeared in the concrete lining.

It is possible to cut a concrete-lined metal pipe with a diamond chisel. Such pipes also may be drilled and tapped in the ordinary way. Aside from the protection it affords, the concrete lining imparts a material increase in the pipes resistance to external pressures. Deflection tests have shown that the concrete lining does not add to the pipes rigidity. A 4-in. pipe placed on supports 10 ft. apart gives exactly the same deflection lined as unlined. The interesting feature of this test, however, is the fact that the concrete bends with the iron without cracking. If the pipe is fractured the break in the concrete lining follows the lines of break in the metal and shows no splintering. Even the pieces flying off when lined pipe is shattered still retain the concrete lining.

THE EXECUTIVE COMMITTEE of the National Safety Council elected at the meeting at Louisville, Oct. 2, to serve until annual meeting of members, 1925, included the following fourteen members at large: C. B. Auel, Westinghouse Electric and Manufacturing Co.; Charles B. Scott, Bureau of Safety, Chicago; Walter G. King, American Optical Co., New York City; George T. Fonda, Fonda-Tolsted, Inc.; C. E. Pettibone, American Mutual Liability Insurance Co.; L. R. Palmer, Equitable Life Assurance Society; H. A. Reninger, Lehigh Portland Cement Co.; Homer E. Niesz, Commonwealth Edison Co., Chicago; Harry E. Webber, Illinois Bell Telephone Co., Chicago; A. L. Watson, Hooker Electro-Chemical Co.; E. W. Beck, United States Rubber Co., New York City; Harry A. Adams, Union Pacific Railroad Co., Omaha, Neb.; James P. Barnes, Louisville Street Railway Co.; Dr. Otto P. Geier, Cincinnati Milling Machine Co., Cincinnati.



Double Tipple No. 32 of the Red Jacket Consolidated Coal & Coke Co., Red Jacket, W. Va.

Where coal beds lie flat and occur close together, as in the case here shown, it is often advantageous to place two dump houses tributary to one conveyor leading to the tipple. By this means the first cost of the entire installation is kept to a minimum.





## News Of the Industry



### Consumers' Reserves of Soft Coal Shrink To 47,000,000 Tons on Sept. 1

Decrease of 15,000,000 Tons Since Jan. 1—Present Supply Would Last 45 Days at Current Rate of Consumption—Retailers' Stocks of Anthracite Sufficient for 58 Days

Commercial stocks of soft coal on Sept. 1, 1924, according to the government's inventory of coal stocks, taken recently, totaled 47,000,000 net tons, a decrease of 4,000,000 tons from stocks on June 1, and 15,000,000 tons from the record of Jan. 1, 1924. The course of stocks has been constantly downward since the early weeks of the year; stocks on Sept. 1, 1924, were 9,000,000 less than on the same date a year ago, and were more than double those on Sept. 1, 1922, at the close of the miners' five months' strike; compared with Aug. 1, 1921, there was an increase of 6,000,000 tons.

Measured in terms of tons, stocks decreased 24 per cent during the first 8 months of 1924. Measured in terms of days' supply the decrease was but little over 2 per cent. These percentages are based on averages which assume that the supply was evenly distributed.

In addition to the estimated quantity in storage piles of actual consumers, the following quantities are known to have been in transit on Sept. 1: On the commercial docks of Lakes Superior and Michigan, 6,600,000 tons; in storage at the mines or at intermediate points, at least 300,000 tons.

**Anthracite.**—Retail dealers' stocks of anthracite were 71 per cent larger on Sept. 1, 1924, than they were on the corresponding date of 1923, and they were but 7 per cent less than on Nov. 1, 1921, two months later in the season. As a result of the steady movement of anthracite up the Lakes the stocks, which stood at 450,000 tons on June 1, had increased to 1,400,000 tons by September 1.

The estimate of soft coal in the hands

of commercial consumers on Sept. 1—about 47,000,000 tons—which is based on reports from a selected list of about 5,000 consumers, does not take into account the coal in the bins of householders, concerning which no data are available, nor steamship fuel, nor the tonnage on the Lake docks, which is considered coal in transit.

It will be seen from Fig. 1 that the period of accumulation of reserves that began with the termination of the miners' strike of 1922 and that resulted in stocks of 62,000,000 tons on Jan. 1, 1924, came to an end during the early months of this year. By June 1 stocks had dropped to 51,000,000 tons, and a further decline during the following three months carried them down to 47,000,000 tons.

The reports from consumers, supplemented by information from other sources, indicate that the total consumption of soft coal during the first eight months of 1924, including coal that entered into the foreign trade, was approximately 310,000,000 tons, or at a daily rate of about 1,270,000 tons. For the five months ended May 31, the average daily rate of consumption appears to have been about 1,370,000 tons, and for the three months ended Aug. 31, it was but slightly over 1,100,000 tons.

#### Stocks in Days' Supply

Fig. 2 compares the days' supply held by the seven principal classes of consumers on Sept. 1, 1924, with that on the same date the year before. Here again the importance of the rate of consumption in determining the adequacy of reserve stocks is strikingly illustrated. As against a 46 days'

supply on Jan. 1, 1924, at the rate of consumption then prevailing, the average consumer on June 1 had a supply sufficient to last 49 days, despite a decrease of 11,000,000 tons in the actual quantity on hand. On Sept. 1, after a further reduction of 4,000,000 tons, the storage piles still held a 45 days' supply at the rate of consumption in June, July and August.

In studying these figures of average days' supply, it should be borne in mind that the reserves on Sept. 1 were based on the summer rate of consumption, whereas the weeks following Sept. 1 almost invariably witness an increase in consumption owing to the change of seasons.

In Fig. 3 the variations in stocks in the several states are graphically presented. The map shows the days' supply held at general industrial plants, excluding byproduct coke and steel works. This is the largest single group of consumers, both numerically and from the viewpoint of consumption, and the one that illustrates best the geographical distribution of reserves. This group is a sensitive business barometer, and changes in its activity are quickly reflected in the coal market, and likewise important changes in the production and prices of coal are soon manifested in the stocks held by the industrials.

Over the country as a whole the industrials had a 48 days' supply on Sept. 1, against a 53 days' supply on June 1 and a 56 days' supply on Sept. 1, 1923. In the case of the industrials, also, the days' supply appears large because of the reduced rate of consumption.

As usual, the reserves varied with the distance from the mine and the character of the coal used. Consequently the map shows that New England, Wisconsin, the Upper Peninsular of Michigan, and the northern Rocky Mountain region had a 90 days' supply, and that New York, New Jersey and the Carolinas had better than a 60-days supply.

In the belt of states extending from Maryland to California, and from Texas

Days' Supply of Bituminous Coal in Hands of Various Classes of Consumers, Nov. 11, 1918, to Sept. 1, 1924 (a)

(Figures represent number of days supply would last at current rate of consumption at time of stocktaking)

	Nov. 11, 1918	Jan. 1, 1919	Jan. 1, 1921	Nov. 1, 1921	Jan. 1, 1922	Mar. 1, 1922	Jan. 1, 1923	Sept. 1, 1923	Oct. 1, 1923	Jan. 1, 1924	June 1, (b) 1924 (b)	Sept. 1, (b) 1924 (b)
Byproduct coke plants.....	35	32	29	38	42	39	19	30	33	35	34	30
Steel plants.....	45	42	42	46	48	48	27	33	39	43	56	42
Other industrials.....	71	65	64	67	51	51	40	56	56	55	53	48
Coal-gas plants.....	85	81	55	87	89	89	60	110	91	91	88	90
Electric utilities.....	49	49	44	54	51	51	33	52	49	51	63	58
Coal dealers, bituminous.....	37	39	30	46	33	33	16	38	36	34	40	46
Railroads.....	31	32	23	31	35	35	16	44	41	44	50	42
Total bituminous.....	45	42	39	43	41	41	26(c)	46(c)	45(c)	46(c)	49(c)	45(c)

(a) The figures in this table are estimates based on incomplete data. (b) The rate of consumption used in calculating the days' supply on June 1, and Sept. 1, 1924, was the quantity consumed from June 1 to Aug. 31. (c) Subject to revision.



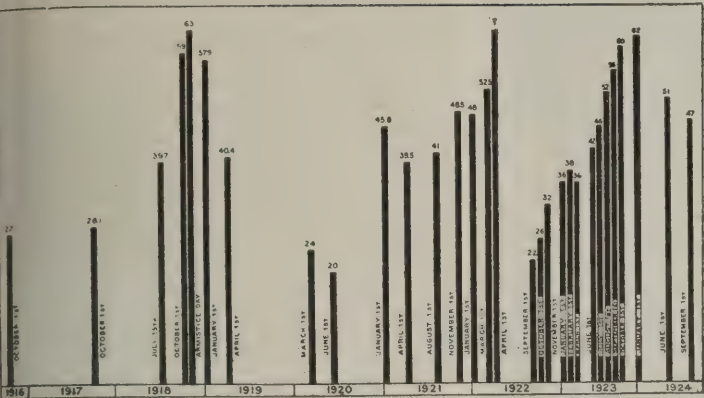


Fig. 1—Total Commercial Stocks of Bituminous Coal, Oct. 1, 1916, to Sept. 1, 1924

Figures represent millions of net tons and include coal in the hands of railroads, industrial consumers, public utilities and retail dealers. Coal for steamship fuel, on Lake docks, in transit and in the bins of householders is not included. These exceptions are important, as the coal on wheels at times has proved a greatly disturbing factor in the calculations of would-be statisticians. Figures for 1923 and 1924 are subject to revision.

to Washington none had as much as a 60-day supply, and in many stocks would have lasted less than 30 days. Some of those states, however, use mostly lignite, and in others little coal is burned owing to the availability of water power, electricity and fuel oil.

As usual, the public utilities were in a particularly strong position regarding stocks; on Sept. 1 electric power plants had a supply sufficient to last 58 days, and manufactured-gas plants had a 90-day reserve.

Complete returns from the manufacturers of byproduct coke and iron and steel showed the following reserves on Sept. 1, 1924, and Sept. 1, 1923:

Byproduct Coke Plants	
Sept. 1, 1924	Sept. 1, 1923
Low volatile.....	33 days
High volatile.....	29 days
	30 days
	30 days
Steel Works	
Sept. 1, 1924	Sept. 1, 1923
Steam coal.....	36 days
Gas coal.....	56 days
	42 days
	33 days

The greatly decreased activity at steel plants was reflected by a decrease of 39 per cent in the daily rate of consumption of coal from June 1 to Aug.

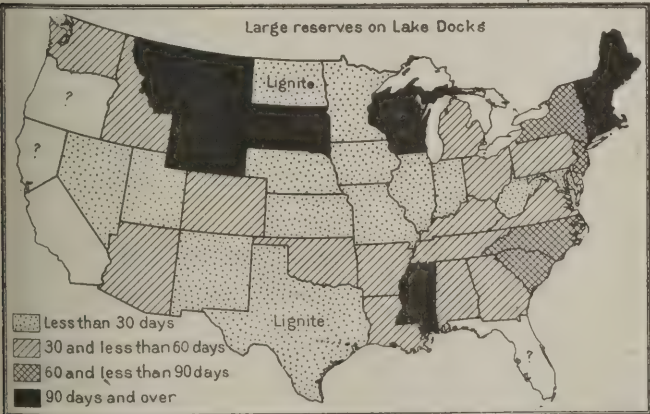


Fig. 3—Days' Supply of Soft Coal on Hand at Industrial Plants, Sept. 1, 1924

At the average rate of consumption during the summer of 1924, stocks at industrial plants, other than steel and byproduct coke, would have lasted on the average 48 days. New England, Wisconsin and the Upper Peninsula of Michigan had supplies sufficient for at least 90 days, and of the states east of the Mississippi only Illinois, Indiana, Maryland and West Virginia had less than 30 days' supply. Based on reports from 2,093 industrial plants.

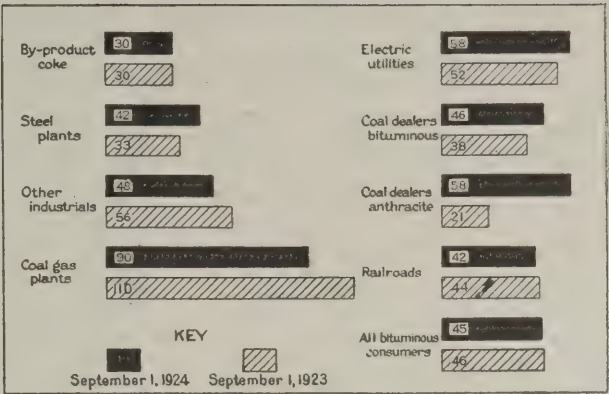


Fig. 2—Days' Supply Held By Different Classes of Consumers, Sept. 1, 1924, and Sept. 1, 1923

At the rate soft coal was burned from June 1 to Aug. 31, 1924, the total stocks on Sept. 1 were sufficient to last 45 days on the average, against a 46 days' supply on Sept. 1, 1923, at the rate of consumption then prevailing. The tonnage now in reserve, although 16 per cent less than a year ago, is nearly as adequate for the present needs as was that on hand a year ago.

the supply a year ago. Compared with Nov. 1, 1921, two months later in the season, the day's supply was identical, but the actual tonnage on hand was 20 per cent less.

The total quantity of soft coal in transit has never been measured accurately, but there is sufficient evidence to indicate that the figure runs into millions of tons, and that it is subject to sudden and wide fluctuation. The available information indicates that the quantity in transit on Sept. 1 was about the same as on Jan. 1, 1924. Reports from an incomplete list of producers who store showed a total on Sept. 1, 1924, of about 300,000 tons against 385,000 tons on Jan. 1, and 440,000 tons on Sept. 1, 1923. The total quantity of unbilled coal standing in cars at the mines was about 750,000 tons.

Manufacturers of byproduct coke accumulated stocks of unsold coke during the first eight months of 1924, and on Sept. 1 a group of 21 plants had on hand a record total of 1,114,000 tons. This was an increase of nearly 45 per cent over the stocks on Jan. 1, 1924, and exceeded the previous high mark established on March 1, 1922, by more than 10 per cent.

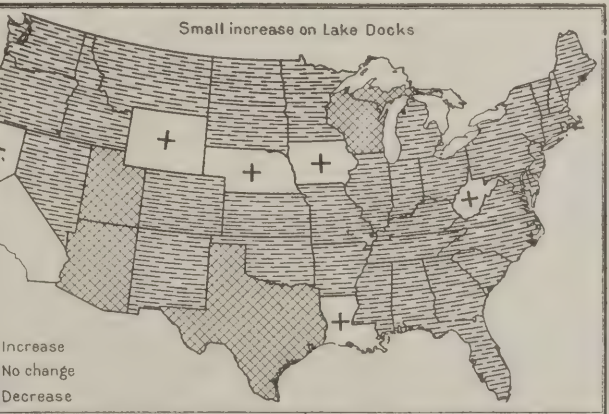


Fig. 4—How Stocks at Industrial Plants on Sept. 1, 1924, Compared With Those on Sept. 1, 1923.

The map shows, state by state, the changes in stocks at 1,839 identical industrial plants, other than steel and byproduct coke works. In only 6 states were stocks larger than they were a year ago, and in the eastern part of the country, West Virginia or W. Va., showed an increase. The decrease in stocks appears to have been due to a sharp decline in requirements, which led consumers to reduce their reserves.



## Unfavorable Reaction Develops Toward Proposed Coal Institute

Wadleigh Plan Would Include Associations of Producers, Wholesalers and Retailers—To Interpret Coal to Public and Foster Research—Stronger Local Organizations Chief Need

By PAUL WOOTON  
Washington Correspondent of *Coal Age*

Coal specialists in Washington do not react favorably to the coal institute which F. R. Wadleigh, former Federal Fuel Distributor, is advocating. None doubts Mr. Wadleigh's sincerity and unselfishness. The very fact that he has sponsored the idea has given big impetus to a proposal which would have been cast aside without serious attention had it come from anyone not known to be thoroughly public spirited.

The coal institute, as proposed by Mr. Wadleigh, is a sort of three-party affair to be composed of the associations representing the producers, the wholesalers and the retailers of coal. It is to be a center of information. Coal is to be interpreted to the public. The organization is so set forth in a dignified way the importance of coal in the national economy. It is to constitute a united front for a campaign to improve public relations. It is to foster research. It is to give technical advice in the art of using coal to the best advantage. It is to eliminate waste in distribution, and is to be a great center of statistical activity covering all branches of the industry.

### Aims to Eliminate Waste

No one attempts to dispute the fact that the aims of Mr. Wadleigh's conception are entirely praiseworthy. At a time when the industry is suffering as never before from overproduction and the attending evils of bankruptcy and unemployment, when distribution is conducted on such slender profits as to imperil its efficiency, any proposal is welcome which will eliminate waste, improve practice and unify the industry. Even the late lamented Coal Commission would have applauded the carrying out of the aims set forth for the proposed organization. It coincides exactly with the plan of constructive trade association activities prescribed by Secretary Hoover.

Desirable as is an *entente cordiale* between the various branches of the coal industry, the majority view in Washington is that the building must be done from the bottom up rather than from the top down. Before a great superstructure can be supported by the National Coal Association, the American Wholesale Coal Association and the National Association of Retail Coal Merchants, the pillars must be strengthened.

In this matter, as in all national questions affecting coal, the views of the Washington coal specialists are entitled to consideration because they reflect not only the thought in the three branches of the bituminous industry but also the viewpoint of the public and of various types of consumers.

Convincing reasons are advanced to show that the first requisites of the coal institute plan are strong national

associations functioning vigorously in their own fields. It can be said truthfully that the National Coal Association, the American Wholesale Association and the National Association of Retail Coal Merchants do not receive the support that they have the right to expect. Incidentally this situation reflects adversely on various elements within those branches of the industry.

The opinion is that the first task is to create three strong national bodies. For instance, in the matter of statistics the institute would get its figures from the national associations. These associations can furnish the facts and figures only if they in turn have the hearty co-operation of all local associations. Not only must there be hearty co-operation but there must be strong local associations before stability can be obtained by the national associations.

In studying the problems which confront our industry there is an increasing tendency to find out if there is anything in the practice of other coal mining countries which can serve as a guide to us. In this particular instance it is worth while to consider what has been done in this line in Great Britain. The association idea has advanced much further in that country than is the case here, yet there has been no federation of the associations. It is true that the British associations have carried on some of the activities suggested for the coal institute but they do not try to do things in common, although each is more ready to take up cudgels for other branches of the industry when it is under a pact, in Parliament or without, than is the case in this country.

The Lancashire and Cheshire associations for a long time have supported research on problems such as spontaneous combustion, mine explosions and permissible explosives. Other associations have been active in financing research work which the trade in this country has been willing to leave to the government. The British associations have carried statistical work to a degree not common in this country. Complete current data are available on costs, on the export trade, on employment, on wages and earnings, on the productivity of labor and on many other matters. The Mining Association of Great Britain has far more data of this character than has its counterpart in this country, the National Coal Association. It has monthly returns of cost from every field and a great mass of other data which enables that association to be the mouthpiece of the coal operator in fact as well as in name. Its board of directors is representative of all the districts. It maintains cordial relationships with other associations, but no super-organization has been created.

### Howat Ineligible for Office, Says Lewis

A recent message from President Lewis to officials of District 14, United Mine Workers (Kansas), declaring Alex Howat, deposed president of the district, ineligible for office in the organization, followed the action of several locals in placing Howat in nomination for the office he once held. Lewis explained that while the application of Howat for reinstatement was accepted by one of the locals several months ago, it has not yet been approved by the International Board, and until such action Alex is not qualified to hold office.

### Interesting Meet Planned by Coal Mining Institute

Deep interest is being manifested in the coming meeting of the Coal Mining Institute of America, at Pittsburgh, Pa., Dec. 3-5. Though all the details of the program have not been completed mining men far and wide urge that plans be made early to attend. The importance of this year's gathering to executives and operating men is only partly disclosed by an announcement of some of the subjects and speakers.

Men of national reputation will describe some of the advances during the last few years in operating methods. For instance, Thomas W. Dawson, chief engineer of the H. C. Frick Coke Co., will present a paper on "Underground Belt Transportation" and Graham Bright will read one on "Recent Developments in Electricity in Coal Mines." Edward Steidle, of the Carnegie Institute of Technology, will speak on "Modern Rock-Dusting Practices." The effect of certain practices such as rock dusting on the health of the miner will be treated in the language of the layman by Dr. R. R. Sayer, U. S. Bureau of Mines, in a paper entitled "Health Hazards in Coal Mining." Other subjects of no less importance will be presented.

Each year the institute invites men from all sections to present practical operating problems for solution, and the practice has been followed this year. At an early date the discussion leaders will meet and choose the best of these problems for "the Question Box."

### Gaskill Reappointed to Trade Commission

Nelson B. Gaskill, of New Jersey, was reappointed a member of the Federal Trade Commission by President Coolidge last week. His term had expired but it was decided at a conference at the White House between the President and Senator Edge of New Jersey to give him a recess appointment. It has not been decided, according to Senator Edge, whether the reappointment of Mr. Gaskill will be made permanent when Congress convenes.



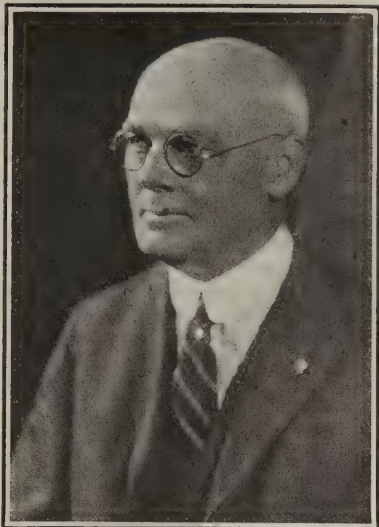
Frederick R. Low Honored at Rensselaer Centenary

Rensselaer Polytechnic Institute, at Troy, N. Y., on Oct. 2-3, celebrated the 100th anniversary of its founding in two days of fairly continuous ceremonies which were participated in by eminent educators, delegates from practically every engineering society in this country, and a number of the leading societies abroad, and by a large body of the engineering alumni of the Institute. In addition to the unveiling of several commemorative tablets at different parts of the campus and an excellent pageant in the evening outlining the history of the school, the exercises consisted mainly in addresses by prominent educators and engineers.

The principal addresses were made by Secretary of Commerce Hoover, Sir Charles L. Morgan, president of the Institution of Civil Engineers of Great Britain; Henry Abraham, past president of the Society of Electrical Engineers of France; Luigi Luiggi, president of the Society of Civil Engineers of Italy; Arthur Surveyor, president of the Engineering Institute of Canada; C. E. Grunsky, president of the American Society of Civil Engineers; Fred R. Low, president, American Society of Mechanical Engineers; William Kelly, president, American Institute of Mining and Metallurgical Engineers; Farley Osgood, president of the American Institute of Electrical Engineers; Prof. Albert A. Michelson, president of the National Academy of Sciences; and Presidents Angell of Yale, Birge of Wisconsin, and Stratton of the Massachusetts Institute of Technology.

At a banquet, at which about a thousand were present, addresses were made by President Livingston Farrand, of Cornell; H. W. Jervey, dean of the Law School of Columbia University, and J. H. Odell, of Wilmington, Del. Honorary degrees of Doctor of Engineering were conferred on the heads of the engineering societies who spoke, and of Doctor of Philosophy upon the presidents of the universities and Dr. Michelson.

Frederick Rollins Low, president of the American Society of Mechanical



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F. R. Low

Engineers, who was one of the recipients of an honorary degree, has been the editor of *Power* since 1888. He was born in Chelsea, Mass., April 3, 1860, and received his education in public schools. For a while he was a clerk with the Western Union Telegraph Co., was a court stenographer from 1874 to 1880 and then was on the staff of the *Boston Journal of Commerce* from 1880-1888. This was at a time when the steam-engine indicator was coming into use, and, being interested in this new device, he did some indicating of engines. Later he invented a compound indicator and planimeter and finally started a department of steam engineering in the paper. At about this time he also invented an arc indicator, a cleaner for vertical tubular boilers, a shaft leveling target, an elevator control and a rotary engine which were developed by the Clark & Low Machine Co.

Mr. Low is the author of "The Power Catechism," "The Compound Engine," "Condensers," and "The Steam Engine Indicator." He was a councilman in Passaic, N. J., from 1901 to 1903, president of the Council in 1905 and 1906 and Mayor of Passaic, 1908 and 1909.

Western Canadian Miners Accept Wage Cut

An agreement to settle the coal strike in District 18, United Mine Workers (Alberta, Can.) has been reached between miners' representatives and the coal operators. By the terms of the settlement the miners will accept a reduction of \$1.17 a day on contract work and one-eighth reduction for day workers, which will amount to about 90c. a day for day workers. This is to be a three-year contract subject to six months' notice of cancellation by either side after March 31 next. Miners generally will vote on the proposed settlement immediately.

Negotiations on a new wage scale between the Western Fuel Corporation, of Canada, which operates mines in the Nanaimo field, Vancouver Island, and its 1,400 employees for a while proved abortive. The old wage contract ended on Sept. 30, and the company posted notices at the pitheads giving terms on which it is prepared to enter into a new wage contract.

The company took the position that there should be a readjustment on the basis of a reduction of 25c. a day. During the war what was known as a "war bonus" of \$1 a day was added to the base rate, which brought it up to \$5. The company felt that, the war being over and the cost of living considerably reduced, this \$1 should be reduced 25c. a day. The men maintained that conditions had altered so little that no reduction was warranted. There were other differences relative to the wages of contract miners on timbering and on production, but the one cited affected all workers below and above ground and was the main issue.

Ultimately a compromise was agreed to, the men undertaking to accept a 10c. a day reduction on the war bonus, making the latter 90c. and putting the base rate in effect for the next three years at \$4.90 a day. While some of the men were reluctant to adopt the recommendation of their committee the latter's advice was finally approved without dissension and a three-year agreement was signed.

Output and Value of Coal from Iowa Mines in 1923

(Compiled by U. S. Geological Survey)

County	Loaded at Mines for Shipment (Net Tons)	Sold to Local Trade and Used by Employees (Net Tons)	Used at Mines for Steam and Heat (Net Tons)	Made Into Coke at Mines (Net Tons)	Total Quantity (Net Tons)	Total Value	Average Value per Ton	Number of Employees				Average Number of Days Worked
								Miners, a	Others	Surface	Total	
Appanoose.....	863,671	48,737	19,259	.....	931,667	\$3,464,000	\$3.72	2,364	488	248	3,100	146
Boone.....	216,092	46,235	2,107	.....	264,434	1,222,000	4.62	402	215	51	668	178
Dallas.....	527,520	14,430	3,911	.....	545,861	1,915,000	3.51	646	272	90	1,008	213
Guthrie, Lucas and Wayne..	696,154	9,144	19,821	.....	725,119	2,509,000	3.46	617	247	76	940	187
Jasper.....	81,852	15,223	6,316	.....	103,391	363,000	3.51	122	70	27	219	142
Jefferson, Keokuk, and Van Buren.....	6,927	7,659	.....	.....	14,586	41,000	2.81	26	3	2	31	193
Mahaska.....	26,702	9,720	989	.....	37,411	130,000	3.47	72	12	7	91	169
Marion.....	675,054	42,686	22,577	.....	740,317	2,478,000	3.35	850	337	111	1,298	203
Monroe.....	1,490,213	32,536	35,033	.....	1,557,782	5,510,000	3.53	1,630	601	180	2,411	198
Page and Taylor.....	9,954	18,685	.....	.....	28,639	136,000	4.75	57	14	6	77	219
Polk.....	380,606	274,802	12,423	.....	667,831	2,428,000	3.63	852	397	122	1,371	191
Vapello.....	150	32,267	650	.....	33,067	108,000	3.27	67	10	6	83	146
Warren.....	43,857	4,056	3,967	.....	51,880	187,000	3.60	92	43	16	151	174
Total, excluding wagon mines	5,018,752	556,180	127,053	.....	5,701,985	20,491,000	3.59	7,797	2,709	942	11,448	181
Wagon mines served by rail..	8,750	.....	.....	.....	8,750	26,000	3.00	.....	.....	.....	.....	...
Grand total.....	5,027,502	556,180	127,053	.....	5,701,735	20,517,000	3.59	.....	.....	.....	.....	...

a Includes also loaders and shotfirers.



## N. C. A. Directors Start Movement to Increase Use of Bituminous Coal

Despite the long period of depression through which the coal industry has been passing, the board of directors of the National Coal Association, at its meeting in Washington, Oct. 10, voted unanimously to continue the assessment of one mill a ton for the support of national association work. It emphasized a full determination to maintain an active and virile association.

Full sympathy was expressed by the board with the purposes of the proposed coal institute, but in a resolution offered by J. T. Bradley, the board registered its conviction that these purposes could be achieved more effectively and more economically by the existing organizations without the creation of a new one.

S. Pemberton Hutchinson, president of the association, reviewed the arguments presented for and against a Department of Mines, at the Sacramento meeting of the American Mining Congress, which he had attended. The board then voted its formal disapproval of the proposed department.

The board approved the action of the research committee in urging that immediate contacts be established with architects and builders looking to the construction of houses in such a way as to make most convenient their heating with bituminous coal. Steps also were taken looking to co-operation with other associations and with the manufacturers of coal-burning equipment for the opening of exhibits at which proper methods of fuel utilization might be explained to the public.

The board of directors and the research committee are much impressed with the possibilities of "keeping cool with coal," as was suggested editorially in a recent issue of *Coal Age*. Orders were issued to leave no stone unturned to ascertain the feasibility of such a development and to encourage research to that end.

Consideration is to be given co-operation with the Stoker Manufacturers Association with the idea of disseminating information as to how bituminous coal can be used with greater satisfaction.

Announcement was made at the meeting of the promotion of Thomas F. Edmunds to be editor of *Coal Review* and of the employment of C. V. Huntress as associate editor, who also will devote a considerable portion of his time to general publicity work.

Mr. Gandy reviewed the Canadian situation before the foreign trade committee. He admitted that the efforts being made by the Canadian Government to stimulate the use of Nova Scotian and British coals are causing some concern, but that everything possible is being done to safeguard the interests of American producers. The board of directors instructed the secretary to acquaint members of the association as far in advance as possible with forthcoming exhibitions in other countries where displays of American coal might be made to advantage.

## French Chemists Test Gasoline Substitute

The search of French chemists for a substitute for gasoline apparently is nearing success, two methods having been described at a conference of scientists on synthetic carburants held in Paris early this month. The first test was made with a fixed motor. Then the empty tank of an automobile was filled with the new substitute by one of the spectators. In both cases as good results were obtained as with ordinary gasoline. For its composition this new carburant needs only lignite coke and water, though charcoal dust has been used with equal success.

The second substitute was described by Professor Maihle, of Toulouse. During a study of ether salts he discovered the existence of an excess of hydrocarbon, which led him to pursue his examination and in his own words "discover a gasoline absolutely analogous to that of Pennsylvania." The new product's calorific power—between 10,800 and 10,960 calories—equals the force of the natural product, he says. His raw materials are animal and vegetable fats heated with chloride of magnesium or sodium, and only a simple apparatus is necessary.

The problem of commercial manufacture he admits, however, presents difficulties, for to produce \$85 worth of the synthetic oil it cost him more than \$150.

## Boston Shippers May Drop Pool Classification

One of the big developments in the tidewater bituminous market at Boston the past week was the suggestion by a committee of the New England Wholesale Association appointed for the purpose of devising some means of bringing about greater uniformity in offerings, that the offering by pool classifications be discontinued. This committee discussed the problem from all angles and came to the conclusion that both sellers and buyers would be best served if West Virginia coal were offered under a trade name and the analysis.

The committee submitted its plan to the board of directors of the association, and while that body has reserved opinion it is generally believed that the plan will be recommended to the members and its use urged.

## Maynard Case Postponed

The Court of Appeals of the District of Columbia has granted an indefinite postponement of argument in the Maynard Coal Co. case pending the action of the U. S. Supreme Court in the Claire Furnace case. The same principle is involved in the two cases. Each action grew out of the effort of the Federal Trade Commission to exact full information as to costs of production.

## Five Glen Alden Collieries Tied Up by Outlaw Strike

(Special to Coal Age)

Scranton, Pa., Oct. 14.—Five Glen Alden collieries were closed down and as many more worked with reduced forces on Monday as the result of an outlaw strike called by members of the general grievance committee at a meeting in Wilkes-Barre a few days before. Today showed an improvement in the strike condition with every colliery in the Lackawanna County group operating with practically full forces. The unauthorized strike went into effect despite a warning against such action by John L. Lewis, international president of the miners' union, who was informed of the general grievance committee's move. Mr. Lewis telegraphed to Rinaldo Cappellini, president of District 1, United Mine Workers, and ordered him to do all in his power to counteract the strike move.

The organizers and other district officials with President Cappellini succeeded in bringing several local unions to meetings and in rescinding the strike vote. The attitude of several of the locals who were led into the strike by the radical element and were outvoted on the motion was expressed in a resolution adopted by the Truesdale Colliery Local against obeying the strike order "first, because it is unlawful and only tends to disrupt the union; second, because the so-called general grievance committee has no legal standing in the constitution of the United Mine Workers, and third, because the only committee which is expected to be recognized by the operators is the colliery grievance committee."

## Two Fires at Anthracite Mine Within Few Days

A section of the No. 1 Ebervale slope of the Jeddo-Highland Coal Co., near Hazleton, was idle last week on account of a fire which broke out in the big vein. The fire is thought to have originated from a broken feed cable. A slight cave, caused by the high water, handicapped the working forces in reaching the flames. The obstacle was finally surmounted and the fire extinguished.

Several days later coal was found burning in the western section of the mine. Since then a large force of men has been fighting the flames.

## Zeigler No. 1 Mine Again Breaks Output Record

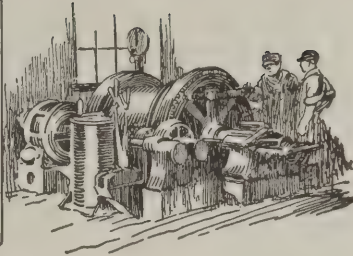
Zeigler Mine No. 1 of the Bell & Zoller Coal Co., at Zeigler, Ill., has again beaten the world's record of 1922. In September, a short month, Zeigler Mine No. 1 hoisted to the surface 171,907 tons.

This is the fourth record credited to the Zeigler mines. In 1917 these mines established the world's record. In March, 1922, Mine No. 1 alone established a record of 164,085 tons hoisted to the surface. In January, 1924, a record was established for the combined production of the two Zeigler mines with a total of 310,053 tons shipped during the month.





# Practical Pointers For Electrical And Mechanical Men



## Insulating Rubber Cable Ends to Reduce Leakage to a Minimum

THERE are few points on an electrical system so vulnerable to dampness, and where leakage in consequence is so common as the ends of cables where the conductors are exposed. While rubber insulated cables are among the most robust that may be used about the mines, yet inattention to details, especially where cables are used in damp places may give rise to serious current leaks. The ideal method of insulating cable ends where they are connected to motors or other apparatus, is to vulcanize them; but this entails considerable expense which in most cases is unwarranted. Consequently in these notes reference is made only to the well-known method of finishing off with rubber and adhesive tape. It is safe to say that in the majority of cases, the ends of rubber cables are improperly prepared before taping, and are seldom completed in a manner likely to reduce leakage to a minimum.

**PRINCIPLE OF INSULATION**

The principle on which the end of a conductor should be insulated and finished off, is that there shall be a sufficient break between the conductor itself and any moisture-conducting material, which may form a part of the insulating and protective coverings. These in the case of rubber-insulated cables consist first of a thin sheath of pure para rubber next to the conductor. Over this and vulcanized to it is a layer of rubberized tape which is covered by a very thin double layer of cotton fabric. Over this is placed the protective covering of braid or whipcord, the stoutness of which depends upon the conditions under which the cable has to work.

In Fig. 1 are shown the various stages in the preparation and finishing of a cable end that is being fitted with a terminal lug. The first part of the process is to bare the conductor as shown at A, care being taken to prevent the knife from cutting into and weakening the outside strands of wire. The outer braid should then be cut back a short distance, depending upon the size of the conductor, but not less than about  $\frac{3}{4}$  in. This will expose the thin cotton fabric which surrounds the vulcanized rubber insulation as shown at B. This thin cotton fabric should not be disturbed until after the lug has been sweated on to the conductor, as the fabric prevents the heat from expanding the rubber unduly when this is being done. After the lug has been

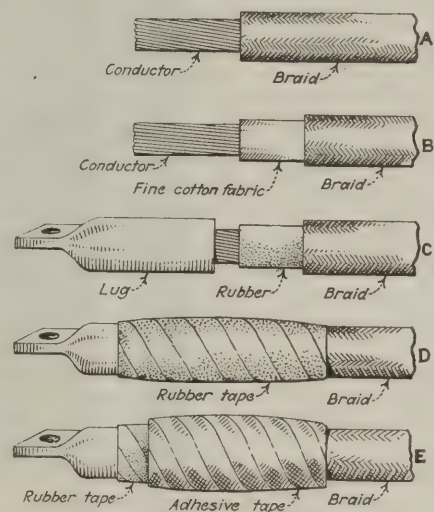


Fig. 1—Cable Ends Made Like This Will Not Leak

A. The first step in the preparation of a cable end consists of cutting back the insulation without injuring the wire. B. Shows the outer braid cut still farther back so that it cannot act as a wick and cause moisture to get at the wire. C. The terminal is now in position and a sufficient section of the wire is still exposed to permit the proper wrapping of tape. D. Rubber tape is wrapped partly over the terminal so as to form a long leakage path between the exposed surface of the terminal and the wire. E. After the adhesive tape has been put in place a coating of insulating varnish should be applied to the joint; this will effectively seal the layers of tape together.

sweated on and the thin cotton fabric has been removed, the cable end appears as at C, and in practice there should be at least  $\frac{3}{4}$  in. between the outer braid and the conductor. Thus, in the event of the outer braid being exposed to moisture this cannot work itself along to the conductor as the short length of rubber insulation intervenes. If the fine cotton fabric is not removed, moisture, after reaching the point at which the outer braid is cut off, continues along this fabric, at the end of which only the radial thickness of the rubber insulation is interposed between the moisture-conducting material and the conductor itself.

The cable end is now ready to be insulated. This should be done with pure para rubber strip. It should be wrapped tightly in order to eliminate air spaces, extended well onto the body of the lug and well past the point where the outer braid has been cut off. The cable end should then appear as at D, the rubber taping being applied until it

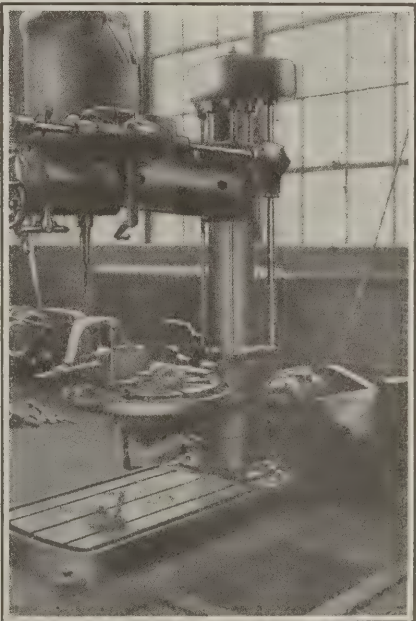
is slightly larger in diameter than the cable itself. The end of the rubber strip should be fastened down with solution. Adhesive tape should then be applied, starting on the outer braid of the cable covering and brought to within  $\frac{1}{2}$  in. of the end of the rubber taping on the lug, thus still preserving the break between all moisture-conducting material and the cable lug. The finished end is shown at E. A coating of varnish extending from the body of the lug to just where the adhesive tape ends, completes the work and makes an efficiently insulated terminal attachment. The foregoing is applicable to cables of almost any sectional area.

ELECTRICIAN.

## Drill Press Conveniences

The machine shop in the central shops building of the Island Creek Coal Co., Holden, W. Va., is equipped with two drill presses; one of these is shown in the accompanying illustration. The drill press itself is not different from the usual type, but an attachment to the drilling table in the form of a vise and a pit in the floor to one side of the base impart greater utility to the machine and facilitate its operation.

The vise is held by bolts in the retaining slots of the drilling table and is attached or detached with little effort. It serves for holding strap-iron and other objects of such shape that they cannot be conveniently held on the



Two Conveniences for a Drill Press

A vise on the drilling table and a pit on one side of the base facilitate the drilling of holes in many objects.



platen. The pit in the floor enables the drill operator to work with long angle-shaped objects by allowing one end to project into the pit.

### Hinged Track Enables Incline To Cross Railroad

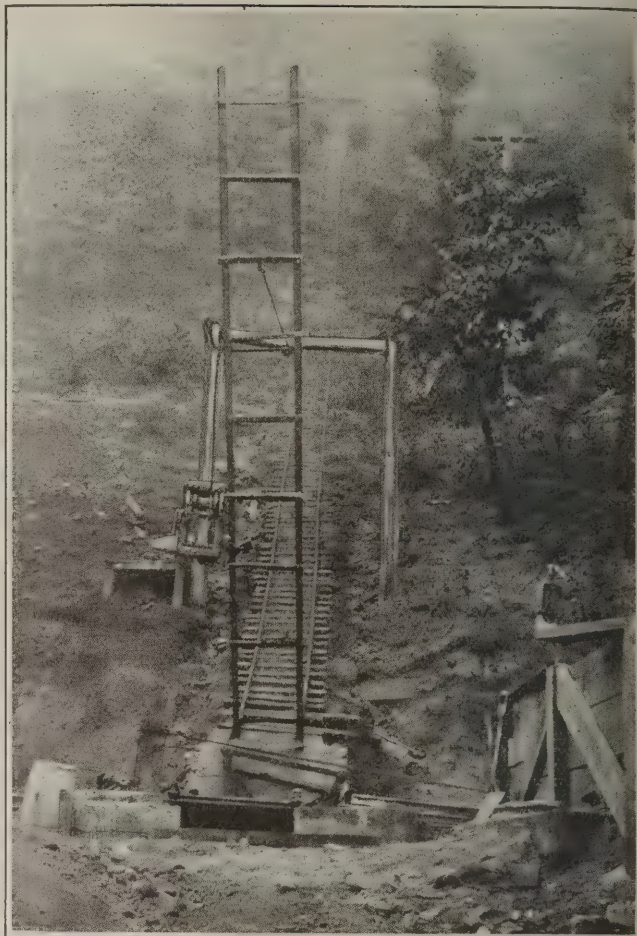
Where a mine in a mountainous district lies at an elevation considerably higher than that of the tippie, it often is necessary to crowd the tippie against the hillside. Usually there is little or no level ground between the hillside and the railroad track for laying out a supply yard, in which case the incline leading to the mine must be provided with some sort of crossing over the railroad to connect it with a mine track leading to the supply yard.

#### BRIDGE SWINGS VERTICALLY

Such a condition prevails at the Gay mine of the Gay Coal & Coke Co., Mt. Gay, Logan County, West Virginia. The crossing of the mine track over the railroad is effected by a bridge track which swings vertically over the railway. One end of the bridge track is hinged at the foot of an incline supply tramway and the other end, when lowered across the railroad, connects with a turntable which can be revolved through 90 deg. to butt with the mine track leading to the supply ward. When not in use the bridge track is swung upward into the clear by a rope that passes from one of the steel ties on the bridge track, around a sheave on a timber set to a windlass.

#### A Successful "Bridge Track"

Because the railroad at the tippie lies between the incline and the supply yard at the Gay mine, a swinging bridge track that is hinged to the lower end of the incline, and connects with a turntable in the foreground, was constructed. This bridge track is raised and lowered by a windlass.



### Gas-Driven Generator For Emergency Power Service

Our company, like others, has often found itself in difficulties due to power interruptions. We take power from a public-utility line which serves many coal mines and other industrial plants in our region. We have been delayed

frequently because some one on the line would have an excessive overload and trip out the main circuit breaker. No doubt power-plant overloads line troubles, grounds and short circuits are contributing causes to our delays.

Whenever the power fails the fan stops and this necessitates much running around to call the men from the

working places and at the same time trying to determine how long it will be before service is restored. All operations stop when no power is available but over-head charges mount up unproductively.

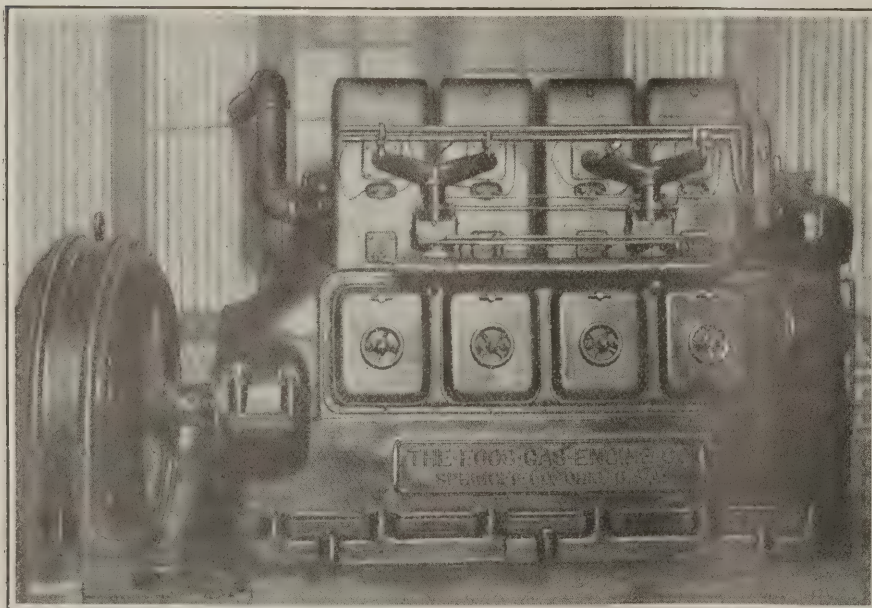
If the power is off for an hour or more and then restored it is frequently a difficult task to get the workmen back to their places. Some already have left the mine because they have an idea that service will not be restored for a few hours and have consequently gone home.

To overcome these conditions we recently purchased a four-cylinder, 100-hp. gas engine. To this unit is connected a 68-kw., 440-volt generator which is connected to a double-throw switch. The power lines from the utility company are connected to one side of the switch and the wires leading from our generator are connected to the other side. Now, when the power company service fails the double-throw switch, normally connected to the power company's lines, is thrown over. This arrangement gives us ample power to drive our fan, of course, other machines are taken off the lines or they would overload our engine.

The ease and quickness with which our stand-by outfit can be started, eliminates the necessity for calling the workmen from their working places, in fact, in about three minutes after a power failure the fan is again started and running with energy supplied from our generating outfit.

JOHN ROUTLEDGE,  
Engineer.

Majestic Coal Co.,  
Majestic, Ala.



#### Gas Engine Drives Stand-by Generator for Emergency Purposes

Whenever the public-utility power fails this unit is started and supplies 440 volt energy for driving the mine fan. Now the workmen may continue with their work, until power is again restored. In this way each man is afforded every opportunity to do a full day's work.





## Problems In Underground Management



### Subsidence, How Far It Extends, Its Depth And Rapidity of Movement

Stretches Furthest Beyond Coal Face When Workings Advance to  
Dip—The Greater the Profundity of the Seam, the  
Less Pronounced the Sag

IN HIS testimony before the Royal Commission on Mining Subsidence, of Great Britain, T. A. O'Donahue, declared that subsidence theories were conceived and then facts were sought to fit the theories. He believed that the observations should be made first and then a theory be formed to accord with them. Mr. O'Donahue said that though he had experience in many fields, he had more intimate knowledge of conditions in Lancashire. He had commenced taking levels in March, 1901, and had continued at intervals of from three to six months from that date to the present time.

During that period, the effect on the surface of workings had been observed over an area extending several miles, the depths of the seams worked varying from 500 to 3,400 ft. In fact as ordnance (government) bench marks were generally available over the area evidence of the settlement was obtained by the first levelings. The surface is covered with a drift of extremely irregular depth, the thickness of which, where proved, ran from 40 to 60 ft.

#### BREAK TO SURFACE SLOPES BACKWARD

In the Upper Seam, which has workings from 500 to 2,500 ft. deep, a line drawn from the edge of the excavated face to the point where subsidence begins to occur at the surface would bear back over the coal face about 5 deg., where the inclination of the seam is about  $16\frac{1}{2}$  deg. With another working face in the same seam, however, subsidence did not extend beyond a vertical line. The difference may be ascribed partly to the steepness of the inclination of the measure (20 deg.).

In the Deeper Seam, which has workings from 1900 to 3,400 ft. deep, the subsidence also extends beyond the edge of the workings to the rise. The maximum angle of the point of "draw"\* beyond the vertical line is 8 deg. The greater angle in this case no doubt is partly due to the lower inclination of the strata. With workings to the dip the subsidence in all cases is found to extend not merely beyond the edge of

the workings but also beyond a line drawn from the edge of the workings at right angles to the plane of stratification.

In the Upper Seam, where the strata are inclined 18 deg., with workings at 1,940 ft. depth, the draw beyond the vertical was 23 deg., or 5 deg. beyond the right-angle line. In the Deeper Seam, with workings 3,000 ft. deep, the draw beyond the right-angle line extended 8 deg., but the inclination of the strata was 12 deg. only, so the total draw beyond the vertical line was 20 deg.

#### SURFACE SUBSIDENCE IS SMALL

The maximum subsidence produced by the Upper Seam was 1 ft. 9 in., where the seam was about 850 ft. deep. The seam at this point was 3 ft. 4 in. thick, and about 6 in. of warrant (worthless material) was excavated with the seam. As roads had to be ripped, the total thickness, in place, of the rock packed into the waste (exclusive of falls of roof) may be taken to average 10 in. over the whole area. The subsidence recorded in this area is exceptionally low compared with all other cases.

At a depth of 1,900 ft. the total subsidence was 1 ft. 6 in. The thickness of the seam at this point was 2 ft. 10 in. and the thickness, in place, of the packing material may be taken to average 10 in. over the whole area. In the Deeper Seam, with workings nearly 3,000 ft. deep, 1 ft. 5 in. of subsidence was recorded. The coal was 4 ft. thick and 1 ft. of fireclay was mined with the coal. As 2 ft. of ripping was taken down, the total waste packing may be taken as being equal to an average thickness of 1 ft. 5 in. over the whole area.

In no case does the full subsidence occur beyond the edges of the workings. In the Upper Seam this maximum is found nearly 900 ft. behind the face of the workings, which are on the rise side. With workings to the dip the full subsidence in one case is 600 ft. behind the edge of the workings. In the Deeper Seam, with the workings to the dip, the full subsidence is 550 ft. behind the edge of the workings. The regularity of the subsidence throughout the entire

area and the comparative rarity of distinct breaks has been due, no doubt, to the thickness of the alluvial drift at the surface. In consequence, extensive buildings over the area to which reference is made have suffered little damage.

Subsidence did not commence until two years after the date of working where the workings were 1,000 ft. deep and advanced to the rise at the rate of 160 ft. per annum. The subsidence then continued for ten years, when it reached the maximum of 1.31 ft. In the Deeper Seam, with workings 3,000 ft. deep, advancing to the dip at the rate of 200 ft. per annum, subsidence occurred 500 ft. in advance of the face and it required twelve years to give the maximum subsidence of 1.44 ft.

### Mine-Haulage Accidents Far Too Frequent

Complaint frequently is made that the haulage-accident rates in mines are inexcusably high. It is true that next to falls of rock and roof come accidents incident to underground transportation, but sight frequently is lost of the fact that half of the tonnage carried by the railroads of the United States first must be transported underground, in the dark and for the most part over temporary roadbeds. Underground hauls of 5 miles are not uncommon. To obtain the economies of quantity production, this haulage must be done at high speeds.

Many underground haulage accidents are due to poor roadbed. Though better roadbeds probably could be provided in many instances, account must be taken of the economic factor and the fact that only the main haulage-way will be used long enough to justify thoroughly substantial construction.

One of the difficulties in the study of these accidents arises from the absence of statistics. Despite the fact that more than \$600,000 annually is made available by the government for the study of safety in connection with rail transportation on the surface, no money has been appropriated for studies of rail transportation underground, which handles half as much tonnage. The Bureau of Mines has made some study of the matter, but the work has been limited by such small sums as could be diverted from the sums assigned to other branches of mine-safety work. The increasing rate of haulage accidents in mines is giving rise to a demand that the government give more attention to studies looking to their reduction or entire prevention.

\*Mr. O'Donahue apparently uses the word "draw" as meaning the point of remotest discoverable subsidence. As a matter of fact that would not necessarily be the point of remotest rupture.



## Rock-Dusting Car for Use At Springdale Mine

So conclusive has been the proof of the effectiveness of rock dusting to check coal-dust explosions that many bituminous mines are accepting it as standard practice. The use of rock-dusting prior to the time its feasibility was generally recognized was so limited that the problems of distributing it most expeditiously are only beginning to be solved. Nowadays a rock-dusting car in its early stages of construction, or completely built, is not an uncommon sight in mine shops.

The accompanying illustration shows a rock-dust distributing car throwing a cloud of dust in the open air. It was built in the machine shop at the Springdale mine of the Allegheny Pittsburgh Coal Co., Logans Ferry, Pa. The construction of the car in its present form is entirely experimental, it being the purpose of the company to determine the best principles upon which to base the design of the rock-dust distributing equipment that ultimately will be adopted.

### METHOD OF OPERATION

The car as shown is equipped with a Sirocco blower that develops about 1,800 cu.ft. of air per minute. It is driven by a 5-hp. direct-current motor. Rock dust is introduced into the blower through a funnel hopper with a fly-leaf valve feed control. The discharge is nothing more than a standard length of 6-in. stove pipe which is connected to the blower by a piece of flexible composition hose. The discharge pipe is moved up, down or to either side by a fulcrum bar to which it is attached by a chain-link coupling; this bar swings in a keeper after the fashion of an oar in the rowlock of a row boat.

It will be noted that the equipment is located on the rear end of the car. In all probability the blower later will be shifted to the front end of the car so as to leave room for a hopper behind it. Rock dust will be fed from the hopper

to the blower by a bottom screw feed. Of course a supply wagon will accompany the distributing car. The rock-dusting outfit will be pulled by a locomotive moving against the air current so that the dust will be carried away from the work trip which will always be in the clear.

## Nova Scotia Man Shows What Has Been Done

In the July 3, 1924, issue of *Coal Age* (Vol. 26, p. 22) a West Virginia Operator requests suggestions from mining men and engineers for the best method of working a somewhat peculiar coal bed. Although the operator making inquiry appears to consider the conditions difficult, I can hardly regard them as such, as I have had experience in mining a somewhat similar measure.

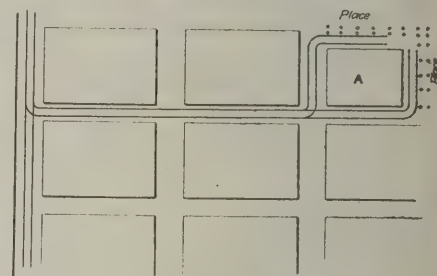
As several plans for working this coal bed have already been suggested I shall confine myself to describing briefly the method of operation with which I am most familiar. The coal bed to which I refer carried a 10-in. drawslate and the upper coal band was 4 ft. thick. An 8-in. rock parting occurred about 12 in. from the floor. In all there were three benches of coal and two of slaty material in addition to the drawslate.

If among these various strata a good mining ply occurs, places or rooms can be driven, say, 12 ft. wide, the mining being done with hand picks. Blocks or pillars 50 or 60 ft. square are left. This process of opening out is slower than by means of double rooms but it will prove more economical and efficient in the end, because when the pillars are being extracted the roof weight makes the use of mining machine unnecessary.

The general plan above outlined proved most advantageous for working the bed described. In some cases the pillars were brought back by longwall retreating, all the faces of a range of pillars being kept in line, while in others they were drawn in lifts. As soon as a lift is finished the roof behind

it is allowed to come down. The accompanying drawing illustrates the method followed.

When a section has been opened out to, say, 400 ft. square the work of extracting pillars may be started. This may be done as at A in the drawing or by working a single longwall face on the rear of the pillar. In such a layout as that shown the longwall face would be preferable because the rock and refuse produced in mining could be disposed of more readily. Experience in coal mining has demonstrated that when dirt occurs in a coal bed the only



Plan of Mining

This is practically a block system of operation instead of a room-and-pillar system. Only a comparatively small proportion of the coal will be secured in blocking out a panel, the chief source of output being the pillars.

satisfactory way of separating it from the coal is to pick it out. Its logical place is in the gob and not on the dump.

Hand operation—that is, pick mining—is advocated for working this bed. This may appear to some to be a somewhat antiquated practice, but it should be borne in mind that so far statistics have never proved conclusively that mining machines have lowered the cost of coal. I believe also that in most cases a far smaller proportion of the cost of producing coal is charged to transporting it from face to tippie and there loading it into the railroad car than would be justified if facts were honestly considered.

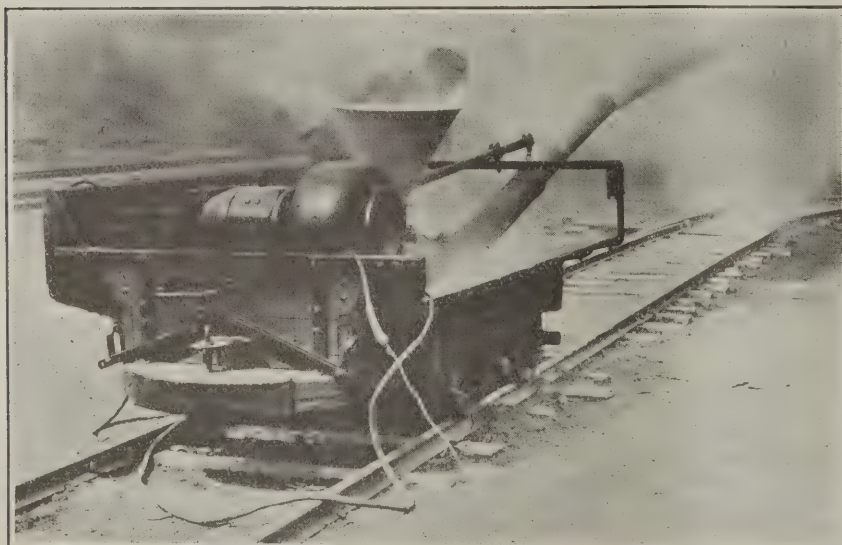
MAC.

River, Herbert, N. S.

Experience with mining machines has shown them extremely profitable both in reducing the cost per ton at the face and in increasing production and thus lowering handling charges per ton. They also have decreased the percentage of small sizes wherever hand mining had deteriorated, as in many places, to shooting off the solid. Undercutting is safer than the indiscriminate solid shooting likely to be employed where mining machines are not used. In most instances, however, union contracts have made the differentials for machine mining over extraction by hand so small that often no economy could be effected in the cost at the face by providing machines.

We are sometimes disposed to believe that mining men of British or other foreign extraction when on this continent are too ready to tackle problems like those they have faced abroad, wholly forgetting that in most parts of America there are so many clean beds that it is inadvisable to attempt the task of working less desirable beds which can be worked successfully only when operating for a market where competition is largely with coals mined under similarly unfavorable conditions.

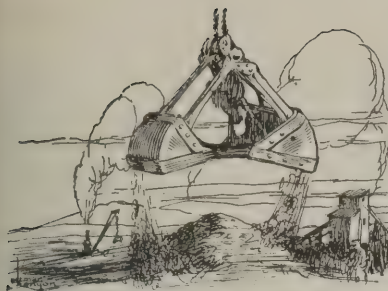
—EDITOR.



Trying Out New Rock-Dust Equipment at Springdale

As will be readily seen this outfit is frankly experimental, being placed within the body of an ordinary mine car and mounted so that the dust must be carried in another car not easy of access. It will, at least, test the equipment. The problem of adjusting the car to the outfit will come later.





# Production And the Market



## Trend of Bituminous Coal Market Is Upward Though Course Is Irregular

The bituminous coal market continues to move irregularly, but the trend is unmistakably upward. Marked strength pervades the trade in New England, reflecting a pickup in the textile industry, but western Kentucky just now probably shows the greatest improvement. In Illinois and Ohio, on the other hand, "no bills" have appeared again, though Cincinnati is an outstanding exception, slack having become scarce there. Caution is in evidence throughout the trade, which means that competition is fairly keen.

### Healthy Undertone Indicated

Much light is thrown upon hitherto dark places by the government's report on commercial stocks of soft coal as of Sept. 1. Though the total reserves in the hands of consumers—47,000,000 net tons—is 4,000,000 tons less than on June 1 and 15,000,000 tons less than on Jan. 1, the supply would fall only one day short of lasting as long as the surplus at the beginning of the year, the disparity being due to the greatly decreased rate of consumption. The steady though gradual increase in demand and output despite the size of the reserves is indicative of healthy underlying conditions in the market.

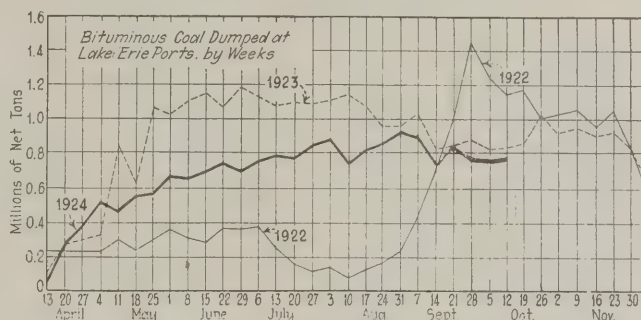
Coal Age Index of spot prices of bituminous coal for the sixth consecutive time registered an advance last week, standing on Oct. 13 at 174, the corresponding price for which is \$2.10. This compares with 171 and \$2.07 respectively on Oct. 6.

A slight increase in activity was in evidence at Hampton Roads last week, dumpings of coal for all accounts during the seven-day period ended Oct. 9 totaling 340,447 net tons, compared with 331,398 tons handled during the preceding week.

Movement of coal across the lakes continues in good volume although it had been expected to fall away markedly by this time. Dumpings at Lake Erie ports

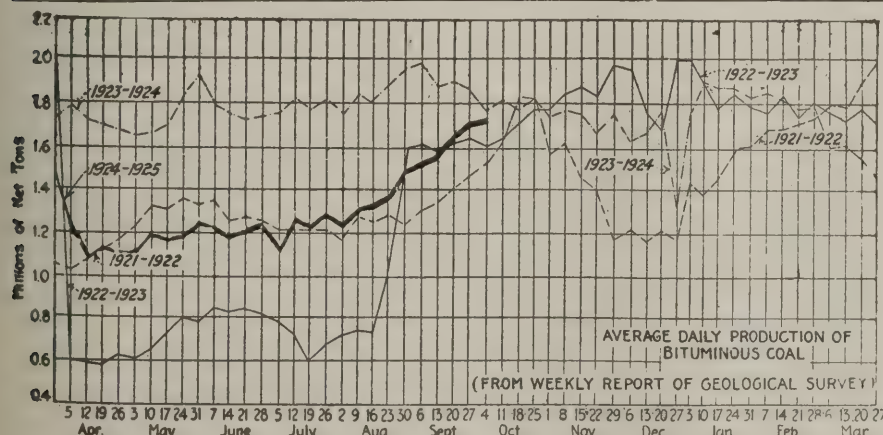
during the week ended Oct. 12, according to the Ore & Coal Exchange, were as follows: For cargo, 737,102 net tons; for fuel, 40,547 tons, compared with 731,604 and 45,145 tons during the previous week.

Anthracite is moving without much difficulty on the whole, stove being in rather strong demand, though chestnut is picking up noticeably and egg is holding its own fairly well. Steam sizes are in fair demand, No. 1



buckwheat showing notable firmness. Independent prices have occasioned much surprise, having soared 75c. above company schedule in some instances. Output is still greatly hampered by floods at the mines, which are even more serious than was at first supposed.

Production of bituminous coal continued to show improvement during the week ended Oct. 4, when, according to the Geological Survey, the estimated output was 10,268,000 net tons, an increase of 128,000 tons over the week ended Sept. 27, when 10,140,000 tons was produced, according to revised figures. On the other hand, there was a sharp decline in the output of anthracite, the total for the week ended Oct. 4 being 1,425,000 net tons, compared with 1,942,000 tons during the preceding week. The falling off was due to the water in the mines.



### Estimates of Production

(Net Tons)			
BITUMINOUS			
	1923	1924	
Sept. 20.....	11,454,000	9,830,000	
Sept. 27 (a).....	11,347,000	10,140,000	
Oct. 4 (b).....	10,699,000	10,268,000	
Daily average.....	1,783,000	1,711,000	
Cal. yr. to date.....	421,712,000	342,341,000	
Daily av. to date.....	1,798,000	1,711,000	
ANTHRACITE			
Sept. 20.....	877,000	1,851,000	
Sept. 27.....	2,025,000	1,942,000	
Oct. 4.....	2,015,000	1,425,000	
Cal. yr. to date.....	73,279,000	69,276,000	
COKE			
Sept. 27 (a).....	321,000	132,000	
Oct. 4 (b).....	312,000	139,000	
Cal. yr. to date (c)...	14,76,000	7,598,000	

(a) Revised since last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.



### Fine Coal a Drug on Midwest Markets

Continued mild weather has affected the Chicago market in so far that off-grades of southern Illinois domestic coal are looking for orders and may be had at somewhat reduced prices to get business, but only on egg and nut. Lump is firm in every field with operators hopelessly behind in making shipments. Some of the large operators in the southern Illinois field have found it necessary to close down because of unsold screenings, hoping thereby to stimulate prices. The tracks are full of "no-bill" fine coal in every district and it is a buyers' market.

From all indications retailers in the central northwest have delivered much coal to domestic users. Eastern Kentucky is firm and Pocahontas screened coal cannot easily be had. Dealers are showing a tendency to bid the price up. Anthracite is moving fairly well and is being rapidly consumed, but no change of price is indicated.

Southern Illinois is still short of lump coal, but egg is not moving as freely as it was a week ago. This is the condition in the Cartersville field although some mines are pretty well sold up on egg. Nut is still plentiful and the smaller steam sizes are heavy and are in the way. Some mines are unable to work on account of "no bills" but most of them are getting on an average four days a week. Railroad tonnage is light. In the Duquoin field conditions are similar to those of the Cartersville district. In the Mt. Olive

field there has been a good movement of all sizes. Most of the small sizes are going on contract and domestic sizes are moving well, as is railroad tonnage. In the Standard field it is still a guess as to whether the prices are bringing the cost. Conditions are unsatisfactory and many mines are idle and will not start up and those that are working have "no bill" steam sizes on hand.

Warm weather caused the St. Louis market to ease off a little this week. There is, however, a fairly good movement, most of it coal sold during the recent cool spell. In a domestic way, however, business is good from the country and for the better grades of coal principally. Two-inch Standard is not taking in the country district this year. As a matter of fact, Standard is hard to move to the country dealer. Locally steam shows activity, especially in wagon load.

### Many Kentucky Mines Oversold

The Louisville local market is in excellent shape, the jobbers' principal complaint being over inability to obtain deliveries from the mines, many of which are oversold. Prices are advancing steadily until the peak quotations in both eastern and western Kentucky are \$4 a ton on best grades of block, although there is not much eastern Kentucky at over \$3.50@3.75. Lump is \$2.50@3; egg, \$2.25@2.75; nut, \$2@2.25; mine run, \$1.35@1.75 and screenings, 85c.@1. Eastern Kentucky is operating on wage scales

### Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern		Market Quoted	Oct. 15 1923	Sept. 29 1924	Oct. 6 1924	Oct. 13 1924†
Smokeless lump.....	Columbus....	\$6.35	\$4.10	\$4.35	\$4.25@	\$4.50
Smokeless mine run.....	Columbus....	3.05	2.10	2.20	2.10@	2.35
Smokeless screenings.....	Columbus....	2.25	1.20	1.20	1.15@	1.30
Smokeless lump.....	Chicago....	6.10	3.85	3.85	3.75@	4.00
Smokeless mine run.....	Chicago....	2.85	1.90	1.90	1.85@	2.00
Smokeless lump.....	Cincinnati....	5.85	4.00	4.10	3.75@	4.00
Smokeless mine run.....	Cincinnati....	2.50	2.00	2.25	2.25@	2.50
Smokeless screenings.....	Cincinnati....	1.60	1.20	1.15	1.25@	1.35
*Smokeless mine run.....	Boston....	4.65	4.25	4.25	4.25@	4.35
Clearfield mine run.....	Boston....	2.00	1.90	1.90	1.45@	2.35
Cambria mine run.....	Boston....	2.60	2.35	2.25	2.00@	2.40
Somerset mine run.....	Boston....	2.35	2.10	2.05	1.75@	2.60
Pool 1 (Navy Standard).....	New York....	3.10	2.75	2.75	2.50@	3.00
Pool 1 (Navy Standard).....	Philadelphia....	3.15	2.70	2.70	2.50@	2.90
Pool 1 (Navy Standard).....	Baltimore....	2.25	2.55	2.60	2.35@	2.85
Pool 9 (Super. Low Vol.).....	New York....	2.35	2.05	2.10	2.00@	2.25
Pool 9 (Super. Low Vol.).....	Philadelphia....	2.45	2.15	2.15	1.95@	2.35
Pool 9 (Super. Low Vol.).....	Baltimore....	2.25	1.85	1.85	1.80@	1.90
Pool 10 (H.Gr. Low Vol.).....	New York....	2.05	1.85	1.90	1.80@	2.00
Pool 10 (H.Gr. Low Vol.).....	Philadelphia....	2.05	1.75	1.75	1.65@	1.90
Pool 10 (H.Gr. Low Vol.).....	Baltimore....	2.15	1.65	1.65	1.60@	1.70
Pool 11 (Low Vol.).....	New York....	1.85	1.60	1.60	1.50@	1.75
Pool 11 (Low Vol.).....	Philadelphia....	1.75	1.45	1.45	1.35@	1.60
Pool 11 (Low Vol.).....	Baltimore....	1.80	1.55	1.55	1.50@	1.60
High-Volatile, Eastern		Market Quoted	Oct. 15 1923	Sept. 29 1924	Oct. 6 1924	Oct. 13 1924†
Pool 54-64 (Gas and St.).....	New York....	1.65	1.50	1.55	1.50@	1.65
Pool 54-64 (Gas and St.).....	Philadelphia....	1.65	1.50	1.50	1.40@	1.60
Pool 54-64 (Gas and St.).....	Baltimore....	1.75	1.40	1.40	1.35@	1.50
Pittsburgh so'd gas.....	Pittsburgh....	2.55	2.40	2.40	2.30@	2.50
Pittsburgh gas mine run.....	Pittsburgh....	2.20	2.10	2.10	2.00@	2.25
Pittsburgh mine run (St.).....	Pittsburgh....	1.85	1.85	1.85	1.75@	2.00
Pittsburgh slack (Gas).....	Pittsburgh....	1.20	1.15	1.25	1.15@	1.35
Kanawha lump.....	Columbus....	3.15	2.10	2.10	2.00@	2.25
Kanawha mine run.....	Columbus....	1.85	1.40	1.40	1.30@	1.55
Kanawha screenings.....	Columbus....	.95	1.15	.95	.85@	1.00
W. Va. lump.....	Cincinnati....	3.35	2.60	2.60	2.75@	3.75
W. Va. gas mine run.....	Cincinnati....	1.65	1.60	1.50	1.40@	1.65
W. Va. steam mine run.....	Cincinnati....	1.65	1.45	1.40	1.35@	1.50
W. Va. screenings.....	Cincinnati....	.80	.95	.95	.90@	1.10
Hooking lump.....	Columbus....	3.05	2.50	2.50	2.40@	2.65
Hooking mine run.....	Columbus....	1.85	1.60	1.60	1.50@	1.75
Hooking screenings.....	Columbus....	.95	1.05	.95	.85@	1.00
Pitts. No. 8 lump.....	Cleveland....	2.55	2.35	2.35	1.95@	2.80
Pitts. No. 8 mine run.....	Cleveland....	1.90	1.85	1.85	1.85@	1.90
Pitts. No. 8 screenings.....	Cleveland....	1.05	1.15	1.15	1.00@	1.15
Midwest		Market Quoted	Oct. 15 1923	Sept. 29 1924	Oct. 6 1924	Oct. 13 1924†
Franklin, Ill. lump.....	Chicago....	\$4.05	\$3.35	\$3.35	\$3.25@	\$3.50
Franklin, Ill. mine run.....	Chicago....	2.60	2.35	2.35	2.25@	2.50
Franklin, Ill. screenings.....	Chicago....	1.35	1.35	1.35	1.25@	1.50
Central, Ill. lump.....	Chicago....	3.10	2.85	2.85	2.75@	3.00
Central, Ill. mine run.....	Chicago....	2.10	2.20	2.20	2.15@	2.25
Central, Ill. screenings.....	Chicago....	.80	1.15	1.15	1.10@	1.25
Ind. 4th Vein lump.....	Chicago....	3.35	3.10	3.10	3.00@	3.25
Ind. 4th Vein mine run.....	Chicago....	2.60	2.35	2.35	2.25@	2.50
Ind. 4th Vein screenings.....	Chicago....	1.20	1.35	1.35	1.25@	1.50
Ind. 5th Vein lump.....	Chicago....	2.50	2.60	2.85	2.75@	3.00
Ind. 5th Vein mine run.....	Chicago....	2.10	2.10	2.10	2.00@	2.25
Ind. 5th Vein screenings.....	Chicago....	.80	1.25	1.25	1.20@	1.35
Mt. Olive lump.....	St. Louis....	3.10	2.85	2.85	2.75@	3.00
Mt. Olive mine run.....	St. Louis....	2.25	2.50	2.50	2.50@	2.50
Mt. Olive screenings.....	St. Louis....	1.25	1.25	1.25	1.25@	1.25
Standard lump.....	St. Louis....	3.00	2.85	2.85	2.75@	3.00
Standard mine run.....	St. Louis....	2.05	1.80	1.80	1.75@	1.85
Standard screenings.....	St. Louis....	.55	.80	.80	.75@	.90
West Ky. lump.....	Louisville....	2.55	2.85	3.35	3.75@	4.00
West Ky. mine run.....	Louisville....	1.75	1.65	1.70	1.50@	1.90
West Ky. screenings.....	Louisville....	.55	.90	.80	.75@	.90
West Ky. lump.....	Chicago....	2.60	2.85	2.85	2.75@	3.00
West Ky. mine run.....	Chicago....	1.75	1.65	1.65	1.35@	1.95
South and Southwest		Market Quoted	Oct. 15 1923	Sept. 29 1924	Oct. 6 1924	Oct. 13 1924†
Big Seam lump.....	Birmingham....	3.75	2.85	3.00	2.75@	3.25
Big Seam mine run.....	Birmingham....	1.95	1.60	1.60	1.50@	1.75
Big Seam (washed).....	Birmingham....	2.35	2.00	1.85	1.75@	2.00
S. E. Ky. lump.....	Chicago....	3.35	2.85	3.10	3.00@	3.25
S. E. Ky. mine run.....	Chicago....	2.25	1.60	1.60	1.50@	1.75
S. E. Ky. lump.....	Louisville....	3.10	3.00	3.10	3.25@	4.00
S. E. Ky. mine run.....	Louisville....	2.00	1.55	1.60	1.35@	1.75
S. E. Ky. screenings.....	Louisville....	.85	.90	.90	.85@	1.00
S. E. Ky. lump.....	Cincinnati....	3.10	2.75	2.75	3.00@	3.75
S. E. Ky. mine run.....	Cincinnati....	1.55	1.55	1.55	1.35@	1.75
S. E. Ky. screenings.....	Cincinnati....	.80	1.00	1.00	.90@	1.15
Kansas lump.....	Kansas City....	5.00	4.50	5.00	5.00@	5.00
Kansas mine run.....	Kansas City....	3.50	3.25	3.25	3.25@	3.25
Kansas screenings.....	Kansas City....	2.25	2.35	2.35	2.35@	2.35

\* Gross tons, f.o.b. vessel, Hampton Roads.

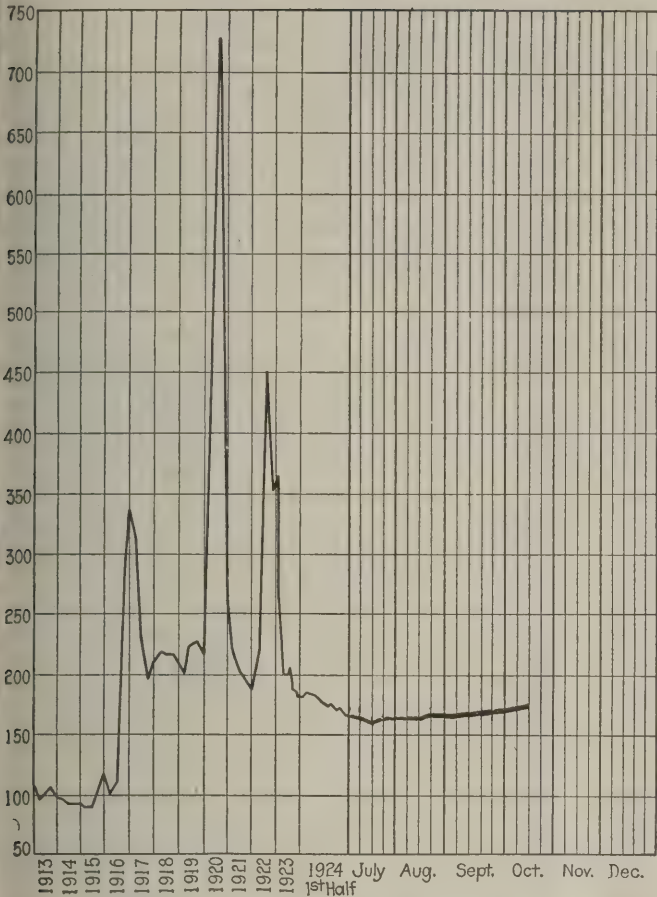
† Advances over previous week shown in heavy type, declines in italics.

### Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

		Market Quoted	Freight Rates	Oct. 15, 1923		Oct. 6, 1924		Oct. 13, 1924†	
				Independent	Company	Independent	Company	Independent	Company
Broken.....	New York....	\$2.34		\$9.60@	\$12.25	\$8.00@	\$9.25	\$8.00@	\$9.25
Broken.....	Philadelphia....	2.39							
Egg.....	New York....	2.34		9.85@	12.25	8.75@	9.25	9.25@	9.25
Egg.....	Philadelphia....	2.39		9.85@	12.20	8.75@	9.25	8.80@	9.25
Egg.....	Chicago*.....	5.06		9.60@	12.50	8.00@	8.35	8.17@	8.27
Stove.....	New York....	2.34		9.85@	12.25	8.75@	9.25	8.75@	9.50
Stove.....	Philadelphia....	2.39		9.85@	12.20	8.90@	9.25	9.35@	10.00
Stove.....	Chicago*.....	5.06		9.60@	12.50	8.00@	8.35	8.63@	8.75
Chestnut.....	New York....	2.34		9.85@	12.25	8.75@	9.25	9.25@	9.25
Chestnut.....	Philadelphia....	2.39		9.85@	12.20	8.90@	9.25	9.25@	9.25
Chestnut.....	Chicago*.....	5.06		9.60@	12.50	8.00@	8.35	8.26@	8.40
Pea.....	New York....	2.22		6.75@	8.25	6.15@	6.65	5.00@	6.00
Pea.....	Philadelphia....	2.14		6.75@	9.00	6.35@	6.60	5.75@	6.00
Pea.....	Chicago*.....	4.79		6.00@	6.75	5.40@	6.05	5.13@	5.45
Buckwheat No. 1.....	New York....	2.22		2.50@	3.50	3.50		2.25@	3.00
Buckwheat No. 1.....	Philadelphia....	2.14		3.00@	3.50	3.50		2.50@	3.00
Rice.....	New York....	2.22		2.00@	2.50	2.50		1.85@	2.25
Rice.....	Philadelphia....	2.14		2.00@	2.50	2.50		2.00@	2.25
Barley.....	New York....	2.22		1.15@	1.50	1.50		1.25@	1.50
Barley.....	Philadelphia....	2.14		1.25@	1.50	1.50		1.50	
Birdseye.....	New York....	2.22		1.60		1.60		1.35@	1.60

\* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.





Index	1924			1923
	Oct. 13	Oct. 6	Sept. 29	Oct. 15
Weighted average price	174	171	170	185
	\$2.10	\$2.07	\$2.06	\$2.24

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and send, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board.

equal to or below the 1917 level, for the most part, and is quoting under western Kentucky, which is asking \$3.75@ \$4 for block and lump; \$3@ \$3.75 for egg; \$1.90@ \$2.75 for nut; and \$1.50@ \$1.90 for mine run. Western Kentucky screenings are 75@90c. It has been reported that some eastern Kentucky screenings have sold as low as 75c. Movement is as full as operating conditions will permit, there being a good car supply and steady demand.

Northwest Markets Unruffled

Pocahontas lump is cutting heavily into the hard-coal business at Duluth. This is creating a serious situation in Pocahontas, as there is much of this coal on the docks in screenings form which cannot be disposed of. Prices are the same all down the line. Docks are loading out rapidly, but most of the coal goes to dealers and little is on its way to industrial concerns. The public utilities, however, are showing signs of life and may come in soon for some of the screenings. It begins to look as if there would be an oversupply of hard coal. Last week 28 cargoes arrived at this port, of which only one was hard coal. Sixteen are reported on the way from lower lake ports, and of these only two are anthracite.

In the Twin Cities no real progress seems to be made in the coal business with the advance of the season. Consumers insist that they can get fuel as they need it, and under the going market and refuse to stock to any extent. This does not seem likely, as a firm market bids fair to prevail for some time. Dock receipts are moderate, indicating that there is not likely to be any great amount received in the remaining weeks of navigation. Present totals

are about the same as a year ago, but the prospective market is greater. The all-rail trade continues to be in considerable of a change, due to the increase in rates on southern Illinois rather cutting off that market in favor of the other districts of Illinois and Indiana. But as yet the demand has been small, and it is something of a question what will happen when the rush begins.

Coal movement has fallen off at Milwaukee during the past week owing to weather conditions. Dealers report a freer movement by rail, but continued difficulty in getting West Virginia splint, Pocahontas and Kentucky coal. Pocahontas advanced at the mines to the extent of a dollar during September. All of this advance has not been reflected by the retail market, but Pocahontas is now selling in Milwaukee at \$11.25 for egg and lump spouted, and \$12 for the same grades carried in. Movement by lake continues free and steady. Receipts thus far in October total 108,019 tons—12,900 tons of anthracite and 95,119 tons of bituminous coal.

Western Domestic Demand Gains Momentum

Demand for domestic grades through the Southwest continues to grow stronger and the mines are working full time. But, as there has been no corresponding improvement in the industrial market, the surplus of screenings, noticeable the last two weeks, is mounting. No changes in prices have been announced.

Colorado coal seems to be moving at a fairly good pace now and with the advent of colder weather operators look for a busy and more lucrative season. Colorado mines worked on an average of 31 hours last week with 21 per cent of the working time lost attributed to "no market." Prices remain unchanged as of Sept. 1 and the supply of labor is sufficient. Transportation and car supply have been very good except in Routt County and the Trinidad district, where shipping of other commodities has caused a slight delay in the movement of coal.

Utah mines are increasing output, but operations still are far below 100 per cent of the full-time capacity; 55 per cent would be the outside. There is a shortage of slack coal, which some believe may become acute. Intermediate sizes are a drug on the market. Both retail and wholesale prices are unchanged.

Domestic Strong, Steam Draggly in Ohio

Many of the largest Cincinnati shippers and wholesalers are "sold up" either to the extent that they have practically nothing to offer or only enough free coal to care for the day to day turn of the market. Nut and slack residue and screenings are holding firm and in most cases show 5c. to 10c. advance in price. Domestic coals, however, have the center of the stage. Central Michigan, northern Indiana and the West were slow in getting into action but have come crashing in with orders. Steam coals are lagging, the range continuing between \$1.35 and \$1.65 for run of mine and 90c. and \$1.10 for screenings. The smokeless market has gone skyrocketing with the rest of the list. Under heavier buying orders practically all of the screenings that were held have disappeared.

Columbus trade is considerably one-sided. There is still a strong demand for domestic sizes, but steam business is slow and draggly. This has resulted in an accumulation of screenings, which have been selling extremely low, and causes the operator to hesitate before taking any further domestic business until he can find a place for the resultant sizes. On the whole the steam trade is not as strong as a week ago, but many producers are still booked up on orders and are running full blast, or at least as much as the labor situation will permit. Retail prices have advanced in sympathy with the higher domestic prices at the mines. Pocahontas and other smokeless grades are strong and little free coal is to be had. Lake shippers are closing up contracts after a rather good season.

Except for a continued strong domestic demand, the Cleveland market has experienced a slight reaction. Spot prices on No. 8 slack and nut and slack are off 5 to 10c. per ton, slack being quoted at \$1@ \$1.05, and nut and slack at \$1.10@ \$1.15, with softening tendencies. Retailers are active. Spot prices on Pocahontas lump have advanced during the past two weeks from \$3.50@ \$3.75 to \$5@ \$5.25 f.o.b. mines, and on West Virginia Panhandle splint lump from \$2 to \$2.50@ \$2.75 f.o.b. mines. The steam trade, however, is quiet and "distress" coal has appeared.

The Buffalo market hears much of the return of business activity all over the country, but does not see much of it,



as business is still dull. But for the increased output there is no doubt that the coal trade would be doing better now. The difficulty is that the operators anticipated this and have already killed the goose before she began to lay.

There is no noticeable improvement in the industrial demand at Toronto and movement is quite limited. Wholesale quotations are as follows: Steam lump, \$6.25@\$.65.0, slack, \$5@\$.5.25; Pennsylvania smokeless, \$5.75@\$.6.25.

### Pittsburgh Feels Stimulus of Cool Snap

Movement of domestic coal has increased rather sharply at Pittsburgh due to a cool snap. Offerings have been plentiful, however, so that prices have not advanced, although they are regarded as far too low, considering the value of domestic coal in the ground. They are much lower than last year. Current quotations are \$2.50@\$.2.65 for 14-in. lump and \$2.65@\$.2.80 for 2-in. lump. Considering the low prices of resultant slack and nut the realization is poor. Steam slack continues soft but is still quotable at \$1@\$.1.10. Gas slack remains at \$1.15@\$.1.35, but there is little going at over \$1.25. A few buyers, particular as to quality, are willing to pay \$1.35.

Production continues to increase in the central Pennsylvania field, 14,043 cars having been loaded during the first week in October, as compared with 13,973 in the last week in September. At Windber, where the Berwind-White operations are located, there is an upward tendency in operations. From three days a week, the company's mines are now operating four and some weeks five days.

### New England Market Still Forging Ahead

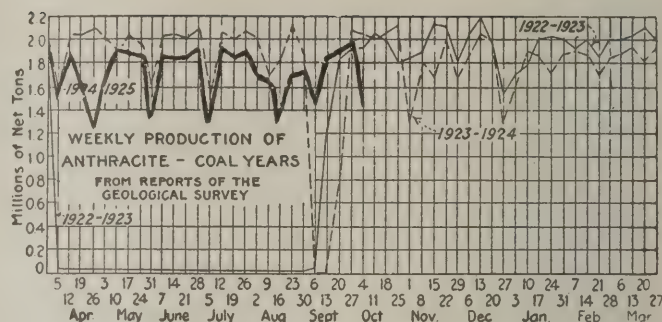
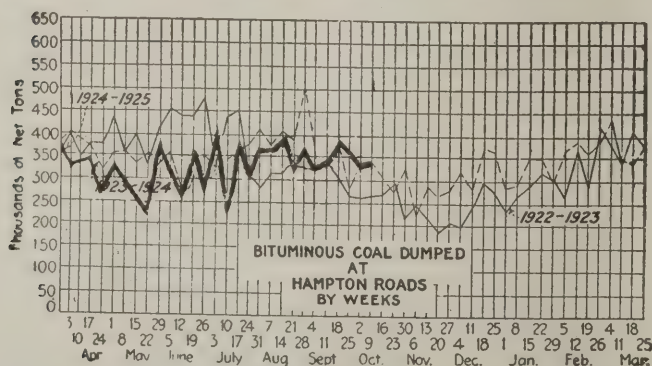
The New England tidewater bituminous market has advanced further with prices higher at the southern loading piers. The lowest at which strictly high grade run of mine New River and Pocahontas is now offered is \$5.40 gross ton on cars Boston, but \$5.50 is generally asked with shadings of more than 5c. infrequent. For late October shipments \$5.60 on cars Boston is named. After an early week softness, when some tonnage of New River was sold at less than \$5.35 on cars Providence, there has been a strengthening there too and \$5.40 is the minimum, with \$5.50 asked.

Local shippers have been unable to pick up really high grade mine run at less than \$4.25 gross ton f.o.b. Hampton Roads the past week and \$4.35 has been paid for a fair tonnage by one large local factor. With consumer demand expanding the market has assumed the greatest activity for months, a worth-while increase in textile operations having taken place.

There is little new in the all-rail situation. Sales are being made here and there, in one instance \$2.75 net ton mines having been obtained for a medium volatile extra lumpy coal. It is only in cases where extra lumpy coal is desired that Pennsylvania coal will interest buyers because even at the advanced prices at tidewater the landed cost of tide coal is under that of rail coal at most New England points.

### Demand Firmer in Atlantic Markets

The market at New York continues to go along without much change. Demand is a little stronger, but this has been met by heavier output, with the result that prices remain about stationary. There is a stronger tendency at tidewater and along the line. Consumers are more inclined to place orders and not so much disposed to question the price if they know they are getting good coal.



Fall business is well under way at Philadelphia and each day brings reports of industrial improvement, especially textiles, and these concerns are taking more interest in coal and are buying somewhat better. That all hands expect better market prices is shown in the care with which commitments are made, as there is an increased tendency not to take on big orders at current prices over an extended period.

The Baltimore market is ascending. Demand has increased from both large and small industrial groups and movement of coal from the mines is now running far ahead of that for October, 1923. Prices have not stiffened, however. The export situation is not as healthy as it should be for this season, the first ten days of October having dropped behind the same period of September.

Little change is reported in the Birmingham steam trade over a week ago. A good sprinkling of orders for spot coal continues—possibly a small gain over last week—but individual orders for substantial tonnages are rather scarce, even the railroads taking minimum allotments. The return of unseasonable weather quickly brought about a retrenchment in domestic buying. Quotations on steam and domestic coal f.o.b. mines are firm. Coal is moving better, production being higher than at any time in the last four months.

### Anthracite Plentiful Despite Flood

Considerable activity in the anthracite market at New York centers around stove coal, with a heavy call for chestnut. Buyers want stove almost exclusively but are asked to take either egg or chestnut with it and sometimes pea or buckwheat No. 1 is added. Consumption has not reached the point where retail dealers are hard pressed for supplies. Dealers' yards are filled to overflowing and they have large reserve stocks of egg and chestnut. Pea moves with some difficulty. Of the steam coals buckwheat No. 1 is the easiest, though rice and barley are in better shape.

Shipments to Philadelphia have been meager during the past week, as production has been greatly hampered by floods at the mines, which are even more serious than was at first reported. Since the cool spell retail trade has slumped. There was surprise when independents advanced prices 75c. above company schedule. Stove is the only size in strong demand, but even this is losing strength. Nut is becoming more popular.

Baltimore dealers report a fairly active demand. While some dealers are having trouble in getting all of the popular sizes they desire as ordered, the majority are able to meet the situation promptly. Most of the yards have fair supplies on hand, with coal running, and are keeping well abreast of their trade.

More coal is moving at Buffalo, but the demand is not large, as the days continue to be sunny and mild. There is all possible promise of a good supply of natural and by-product gas, but beyond that the consumer seems likely to be dependent on the regular anthracite supply for the winter. A few are using coke and finding it good, but sales are light.

### Car Loadings, Surplusages and Shortages

	Cars Loaded	
	All Cars	Coal Cars
Week ended Sept. 27, 1924.....	1,087,447	193,422
Previous week.....	1,076,553	183,315
Week ended Sept. 29, 1923.....	1,097,493	200,955

	Surplus Cars		Car Shortage	
	All Cars	Coal Cars		
Sept. 30, 1924.....	116,689	58,375		
Sept. 22, 1924.....	143,345	72,279		
Sept. 30, 1923.....	41,745	5,651	15,331	5,439



## Foreign Market And Export News

### Inland Demand Active in British Market; Export Trade Depressed

Conditions are still far from satisfactory in the Welsh steam coal trade, though anthracite and dry steam coals are active and firm. The inland trade is showing the usual activity at this season of the year, but this is not enough to make much difference to the trade as a whole in the face of the acute depression in the export field. Demand from the Continent is particularly quiet. Shipments to France and Italy are low on account of the supplies of German reparation coal going to those countries. Welsh steam coal is quite unable to compete, and it is only in respect of contract deliveries and in cases where the highest quality coal is essential that the Welsh exporters are able to hold their own.

In a number of cases collieries are working only about half time and in several instances large collieries have been closed for a week at a time. The Bedlinog Collieries, employing 2,000 men, have stopped. Notices have been given at two collieries owned by Crayshaw Brothers, which will throw 2,300 men out of work at the end of a fortnight. Notices are expiring also in regard to some 3,000 or 4,000 other miners. Thirty-eight thousand miners are reported to be unemployed. Despite the fact that working costs are so much in excess of market prices, colliery owners have been compelled to make further reductions in quotations.

The general position of the Newcastle market is unchanged, with slight improvements in certain sections. Best steams are fairly steady, but the rates are weak compared with normal times. Small steams have been temporarily scarce, and for a time improved a little, but the firmness is due rather to the refusal of owners to make concessions than to any expansion of business.

Output by British collieries during the week ended Sept. 27, a cable to *Coal Age* states, was 5,210,000 tons,

according to the official reports. This compares with 5,135,000 tons produced during the week ended Sept. 20.

#### Coastal Trade at Hampton Roads Heavier; Prices Stiffen

Little change is perceptible in the activity at Hampton Roads. The market continues firm, with a slight increase in coastwise movement and bunker trade. Foreign movement is unchanged, with scattered cargoes for Italy, Brazil and other countries. Prices show a tendency to stiffen, indicating higher levels in the immediate future. Supplies at tidewater are dwindling to some extent in the face of heavier rail movements to the West and elsewhere.

General movement over the piers is on the increase and many good orders were reported in the trade for movement within the next ten days or two weeks.

#### French Industrial Inquiry Slow; Household Shipments Lower

Inquiry for industrial coals continues slow in the French market and wholesale prices hold to the level on Oct. 1, with the exception of industrial briquets, which have been reduced from 142.20 to 135.20f. The spread between British and French prices has been increased by the further rise of sterling.

Shipments of house coals from the mines are lower, as the merchants' autumn supply is now sufficient to meet consumer demand. Retail prices in the Paris market have been raised an average of 5 to 10f. per ton on September; anthracite nuts have been increased by 15f.

French imports of British coals are now nearer normal, but the quantities received for open sale from Germany are still weak. Shipments of sized coals

from Belgium are delayed through the rolling stock position there.

Deliveries of indemnity fuels from Germany to France and Luxemburg during the first twenty days of September were 610,700 tons, including 295,200 tons of coal, 297,500 tons of coke and 18,000 tons of lignite briquets, a daily average of 30,000 tons. Since Oct. 1, deliveries have been made under the Dawes plan.

During September the O.R.C.A. received 275,896 tons of coke, a daily average of 9,200 tons, as against 280,938 tons in August.

#### Export Clearances, Week Ended Oct. 6, 1924

FROM HAMPTON ROADS		Tons
For Argentina:		
Ital. Str. Piave for Buenos Aires.....		7,206
For Canada:		
Ital. Str. Genazio Florio, for Montreal.....		6,296
Ital. Str. Valpurga, for Montreal.....		7,332
For Cuba:		
Br. Str. Berwindmoor, for Havana.....		9,520
Br. Str. Silverway, for Havana.....		3,291
Amer. Schr. Dewitt Brown, for Cienfuegos...		1,720
For France:		
Fr. Str. P. L. M. 21, for Marseilles.....		8,103
For Italy:		
Ital. Str. Golden Gate, for Genoa.....		3,524
For West Indies:		
Nor. Str. Bur. for Fort de France.....		6,084
FROM PHILADELPHIA		
For Cuba:		
Br. Str. Portmore, for Havana.....		—
Newfoundland:		
Nor. Str. Recto, for St. Johns.....		—
FROM BALTIMORE		
For Porto Rico:		
Am. Str. Delfina, for Guanica.....		592
Am. Str. Delfina, for San Juan (coke).....		180
For Italy:		
Ital. Str. Astor, for Genoa.....		9,027

#### Hampton Roads Pier Situation

N. & W. Piers, Lamberts Pt.:	Oct. 2	Oct. 9
Cars on hand.....	1,505	1,128
Tons on hand.....	98,085	71,373
Tons dumped for week.....	99,331	115,089
Tonnage waiting.....	10,000	6,000
Virginian Piers, Sewalls Pt.:		
Cars on hand.....	1,347	1,210
Tons on hand.....	93,650	83,650
Tons dumped for week.....	81,410	106,433
Tonnage waiting.....	7,315	6,666
C. & O. Piers, Newport News:		
Cars on hand.....	1,132	1,176
Tons on hand.....	57,265	59,725
Tons dumped for week.....	115,151	82,449
Tonnage waiting.....	350	510

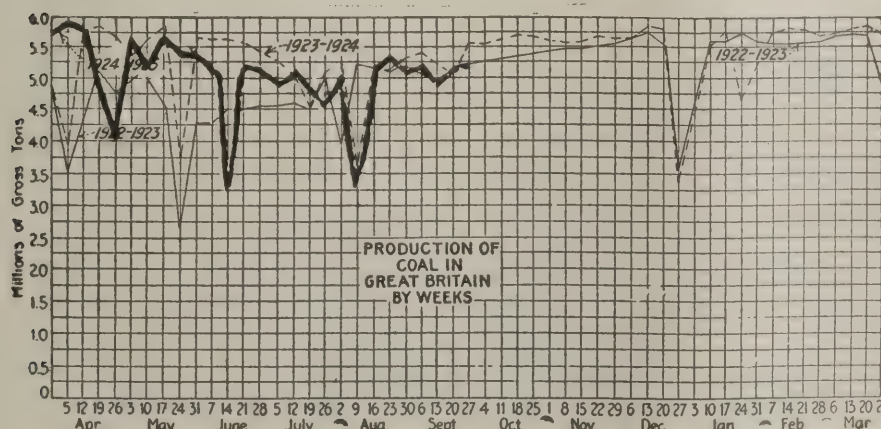
#### Pier and Bunker Prices, Gross Tons

PIERS		Oct. 4	Oct. 11†
Pool 9, New York...	\$4.75@5.05	\$4.75@5.05	
Pool 10, New York...	4.60@4.75	4.60@4.75	
Pool 11, New York...	4.35@4.50	4.35@4.50	
Pool 9, Philadelphia...	4.90@5.25	4.90@5.25	
Pool 10, Philadelphia...	4.45@4.70	4.45@4.70	
Pool 11, Philadelphia...	4.30@4.50	4.30@4.50	
Pool 1, Hamp. Roads	4.15	4.25	
Pool 2, Hamp. Roads	4.05	4.10@4.15	
Pools 5-6-7 Hamp. Rds.	3.90	4.00@4.10	
BUNKERS			
Pool 9, New York...	\$5.00@5.30	\$5.00@5.30	
Pool 10, New York...	4.85@5.00	4.85@5.00	
Pool 11, New York...	4.60@4.75	4.60@4.75	
Pool 9, Philadelphia...	4.90@5.25	4.90@5.25	
Pool 10, Philadelphia...	4.75@4.95	4.75@4.95	
Pool 11, Philadelphia...	4.50@4.70	4.50@4.70	
Pool 1, Hamp. Roads	4.25	4.25	
Pool 2, Hamp. Roads	4.15	4.10@4.15	
Pools 5-6-7 Hamp. Rds.	4.00	4.00@4.10	

#### Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations by Cable to Coal Age		Oct. 4	Oct. 11†
Cardiff:			
Admiralty, large.....	27s.		27s.@27s.6d.
Steam smalls.....	14s.6d.@15s.		
Newcastle:			
Best steams.....	23s.@24s.		17s.9d.@18s.6d.
Best gas.....	21s.@22s.		21s.@22s.6d.
Best bunkers.....	18s.6d.@19s.		17s.6d.@18s.6d.

†Advances over previous week shown in heavy type, declines in italics.







## News Items From Field and Trade



### ALABAMA

Work has begun on the addition of 25 Koppers byproduct ovens at the plant of the Alabama Byproducts Corporation, Boyles, for which the contract was recently awarded.

The Pratt Fuel Co., Birmingham, of which Walter Moore, 715 American Trust Bldg., is president, is reported to have acquired the coal lands, mines and leases of the Nelson Coal Corp., of which Frank Nelson, Jr., is president. This purchase includes 1,200 acres in Walker County and the Red Star mines and equipment.

The Moss-McCormick Coal Co. is opening new coal mines near Jasper. They will have five openings, the coal from which will be handled over one centrally located tippie. C. E. Crandall, superintendent, says that the total tonnage of this company will approximate from 2,000 to 3,000 daily when the property is fully developed. This company will build a railroad from the mines connecting with a spur of the Frisco Railroad. Employment will be given to 600 miners.

At the sixth annual Alabama first-aid meet, held at Rickwood Field, Birmingham, Oct. 7, three interesting events in first-aid work were staged and participated in by forty-nine teams. First prize was won by the white men's team of the DeBardeleben Coal Corporation, Empire (J. L. Shores, captain), which made a score of 99½ per cent, second prize going to the white men's team of the Woodward Iron Co., Bessemer, (W. E. Street, captain), with a score of 97 per cent. The ladies' teams from the Majestic Mines of the Majestic Coal Co., (Mrs. Geo. Rudd, captain) and a team from the Empire mines of the DeBardeleben Coal Corporation (Mrs. J. D. Sumners, captain) tied for the ladies' prize, the former winning in the run-off with a score of 97½ per cent. The winning colored teams were: First prize, Woodward Iron Co., Dolomite (Henry Dean, captain); second prize, Woodward Iron Co., Mulga (Chester Fuller, captain). These teams tied, the former being winner in the second trial, making a score of 96 per cent.

A new washery will be constructed and extensive changes and improvements will be made to the tippie at the Empire Mines of the DeBardeleben Coal Corporation, located on the Frisco Railroad, Walker County, involving an expenditure of approximately \$100,000, according to official announcement. The old washery is located some distance from the coal tippie, involving a switching cost at present, which the location

of the new washery will eliminate. Coal is mined at Empire from two openings, Nos. 1 and 2, on the Black Creek seam and is dumped at the same tippie, motor and tail-rope haulage being employed.

According to reports from the Walker County field the Galloway Coal Co. is considering the development of its Mill Creek properties, near Carbon Hill.

Coal mines are being opened at Altoona, Etowah County, on the Underwood seam by W. L. Smith and associates of Gadsden. A production of 400 or 500 tons daily is planned. A spur track and tippie structure are in course of construction.

The Birmingham agency of the Westinghouse Electric & Manufacturing Co. has been moved from the Brown-Marx Building to Rooms 1407-11, Age-Herald Building and advanced to a branch office with John Gelzer, Jr., as manager. The new quarters are much larger than the offices formerly occupied.

Contract has been awarded by Moss-McCormack Co. for the construction of a spur to its new developments near Carbon Hill, Walker County, on lands acquired from the federal government about two years ago. The track will be an extension of the Frisco Ry. spur to No. 11 Mine of the Galloway Coal Co., which connects with the main line at Carbon Hill. Stanley & Singer, of LaFayette, will construct the new line.

### ILLINOIS

The Lovington mine, near Paris, resumed work Oct. 1, after approximately a year of idleness. The mine is one of the largest in central Illinois. It was closed last fall because of lack of orders.

### INDIANA

A conference of mine workers' officials with representatives of the Knox Consolidated Coal Co. held Oct. 1 at the office of Phil Penna, secretary of the Indiana Bituminous Coal Operators' Association, failed to bring any solution regarding the division of work in the Bicknell field. The Knox company owns five mines in that field, only three of which have been operating. Those who had been employed at the idle mines asked that the company divide the work so the idle mines would operate part of the time. In the contracts the operators have agreed to a fair division of the work whenever business conditions permit. They explained to

the committee that business conditions are not such that the company can operate the two idle mines and that further division of the work is impossible.

### IOWA

Coal has been found on the August Witt farm, near Merrill, Iowa, a 15-in. vein having been struck by drillers at a depth of 415 ft. Another test will be made east of Merrill and if a satisfactory amount of coal is located, active mining will be begun.

### KANSAS

The campaign for complete unionization of District 14, United Mine Workers, recommended recently by two representatives of the International board, is under way. Osa Gasaway, International board member from District 8, and D. F. Frampton, of Moberly, Mo., an International organizer, are at work among the non-union miners of the district.

### MARYLAND

The Eastern Fuel Co., has opened an office at 638 Equitable Building, Baltimore, in charge of Hall Hammond.

### MINNESOTA

Bids for fuel for the county home and the Ancker City and County Hospital, St. Paul, were rejected a few weeks ago and new ones taken on a B.t.u. basis. Buying the old way resulted in a loss of nearly \$13,000, according to estimates by the City Chemist.

The County Board of Control in St. Paul has awarded contracts to the Northern Coal & Dock Co. for furnishing West Virginia splint for the county home at \$5.40 on track, and for the Ancker City Hospital at \$6.25 delivered. Both are on the B.t.u. basis of 14,100. Previous bids on a straight basis were rejected.

### MISSOURI

James Duncan, of Alton, Ill., was named permanent receiver for the St. Louis Coke & Iron Co. by Federal Judge Fitzhenry at Springfield, Ill., Oct. 6. Mr. Duncan, who is president of the Litchfield & Madison R.R., has been acting as temporary receiver for the company since Sept. 8, when a friendly receivership suit was instituted by the Iron Mountain Co., a creditor.



## NEW YORK

Will A. Brown, who is well known to the coal trade, having been engaged in the New York market for many years, has removed his office from 25 Beaver Street to No. 1 Broadway.

The request for offers to furnish slack coal to the Buffalo waterworks in 300- and 500-car lots brought out 17 bids, which were opened Oct. 6. Prices offered ran from \$3.47 to \$3.89 including mostly a \$2.24 freight rate. It will be some days before the lowest regular bid is fixed upon.

The New York Stock Exchange has stricken from the trading list, at the request of the Consolidation Coal Co. \$40,205,448 of its capital stock as a result of correspondence between the company and the listing committee regarding the issuance last spring of \$10,000,000 preferred stock, following which the stock previously outstanding became common stock. An amendment to the company's charter by the Maryland Legislature, required to make the change, was obtained after some delay.

When the war broke out the government took over the Donner-Hanna Coke Corporation's plant at Buffalo, then nearly finished and ran it as long as was desirable, then turning it back to the company, but never entirely relinquishing ownership. For this reason the private corporation has refused to pay taxes on it. On Oct. 6 Supreme Court Justice George E. Pierce decided that on account of the failure of the company to bring a certiorari proceeding in time, it will be obliged to pay \$130,000 in taxes and interest to the city and county.

## OHIO

Tom Dew, formerly vice-president of the Western Coal Co., has been appointed to represent the R. R. Smith Coal Co., of Huntington, W. Va., on the Cincinnati market. He will continue to retain his interest with the Humphrey Coal Co.

William S. Ranson and Delvin Orr, formerly identified with the Matthew Addy interests, have opened a wholesaling and jobbing concern in coal, coke, charcoal, pig iron and alloys in the Dixie Terminal Building, Cincinnati, under the name of the Ranson & Orr Co.

A petition has been filed in the Columbus courts, asking for the appointment of a receiver for the Consolidated Mining Co., a corporation, which formerly had offices at No. 8 E. Broad St. and which has since ceased to function as an active business. The petition was filed by the Central West Coal & Lumber Co., which holds an unsatisfied judg-

ment of \$9,462 against the defendant company. In the suit Henry Watkins and Albert Goff, president and vice-president, respectively, of the Consolidated Mining Co., were made co-defendants.

Coal men generally extended their condolences to Fred Legg, president of the Logan & Kanawha Coal Co., Cincinnati, whose father died at Montgomery, W. Va., on Sept. 26. His father, Richard Legg, had long been identified with the coal and railroad interests of the Mountain State.

J. T. Dunnigan, who for several years has been identified with the Harlan Kileoka Coal Co., at Harlan, passed through Cincinnati on Sept. 30 to take charge of the Coal River Collieries, owned by the Brotherhood of Locomotive Engineers. He will have general charge and supervision of these properties.

It was announced by officials of the Ohio Collieries Co., New Lexington, recently that Mine No. 256, at Glouster, and Mine No. 281, at Modoc, would reopen soon giving employment to about 600 men. The two mines have a daily capacity of 4,200 tons of coal and are the largest in the Hocking field.

Operations were resumed Oct. 9 at the Blue Rock Mine, located in Muskingum County, near the river bearing that name, for the first time since the disastrous flood of 1913. Following the flooding of the workings the mine was sealed and only recently Jerome Watson, head of the Ohio Mines Department, and a number of deputies explored the mine and has put it in shape for working. The mine is one of the oldest on the Muskingum River, having been opened in 1845, when the product was shipped by river exclusively. A squeeze occurred in 1854, when four miners were entombed and a new opening was made at that time. The gas formed to such an extent in the mine before it was opened by the mine department that it burst through the hill a few months ago.

## OKLAHOMA

After only a few days of quiet, hostilities were reopened in Oklahoma on the night of Oct. 6, when gateways to Mine No. 12, of the Rock Island Coal & Mining Co., near Hartshorne, were dynamited, and an attempt was made to burn two railroad trestles leading to the mine. The mine, which employs 350 men, has been operating part time. The company has been paying the 1924 wage scale approved by the union at its No. 12 mine, but had announced its intention to reopen other mines on an open-shop basis paying the 1917 scale.

## PENNSYLVANIA

The mine and other coal property of the Hess Coal Co., near Punxsutawney, was sold at auction on Oct. 1, being bid in by Scott Calderwood, one of the creditors and a stockholder in the company, for \$27,000.

The Somerset Realty Co. has purchased the Koontz farm, near Somerset, Somerset County, and has opened a coal mine. The company will be known as the Somerset Springs Coal Co. and the product will be known as "Coffee Springs Coal." The officers of the new concern are David Goodstein and W. Curtis Truxal.

A new service for members of the United Mine Workers in District No. 2, which includes fourteen counties in central Pennsylvania, was inaugurated recently when a compensation department was opened in Johnstown. Attorney Peter Jurchak has been named superintendent, with offices in the United States National Bank Building. This department has been under consideration for eight years and was finally authorized at the convention in Altoona early this year. The department will serve members of the union of all fourteen counties in District No. 2, which are included in the jurisdictions of these compensation referees, as follows: Jacob Snyder, of Altoona; W. W. Champion, of Williamsport, and G. Scott Smith, of Kane. The district includes these counties: Cambria, Somerset, Bedford, Blair, Clearfield, Huntingdon, Centre, Indiana, Armstrong, Jefferson, Clarion, Elk, Cameron and Tioga.

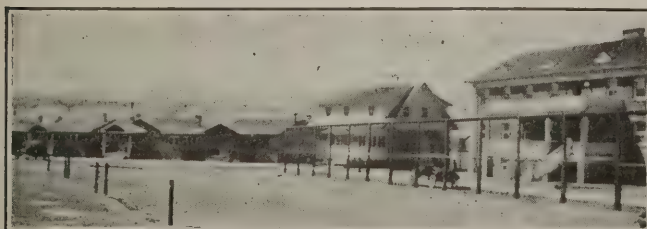
After pumping out the water in the old No. 5 anthracite slope at Silver Brook, the John C. Haddock Coal Co., which is reclaiming the operations after an idleness of over thirty years, expects soon to increase its tonnage from the local breaker. Free access now is afforded to sections of the mine which were submerged. A large force of men is working and additional employees will be taken on soon, it was announced. Silver Brook, formerly operated by J. S. Wentz & Co., was closed and abandoned when a disagreement arose over the terms of a new lease. The lessees are erecting homes for their men who desire to live near the mines.

## UTAH

J. A. Stallings, sales-manager for the Spring Canyon Coal Co., Salt Lake City, who had been ill for some months and returned to his desk recently has had to lay off again.

H. F. Fernstron, manager of the Western Fuel Co. and president of the Utah-Idaho Retail Coal Dealers' Association, has been selected chairman of the advertising and publicity committee of the Salt Lake City Chamber of Commerce.

B. W. Dyer, district engineer of the U. S. Bureau of Mines in Utah; State Coal Mining Inspector John Crawford and other officials will soon begin an investigation of the explosion at the Rains mine of the Carbon Fuel Co., this



Wardell Court.

A Square in Front of Union Pacific Coal Co.'s Club, Rock Springs, Wyo.



city, which resulted in the loss of five lives and wrecked the mine. Mr. Dyer said that the investigation had not been commenced yet because the ventilation had not been restored. He hoped, he said, to be able to issue a report about Oct. 11. Mr. Crawford completed an inspection of the mine about one week prior to the disaster and pronounced it safe. A. H. Jenkinson, secretary-treasurer of the company, declared that all of the new mine safety regulations of the Industrial Commission had been complied with.

## WEST VIRGINIA

The Buffalo Thacker Coal Co. has disposed of three of its mines at Ottawa, on the Chesapeake & Ohio Ry, and one mine at Chattaroy, on the Norfolk & Western Ry. It is understood the Eastern Coal & Export Co. was the purchaser.

James L. Crawford, of Page, and Joseph A. Graft, of Beckley, civil and mining engineers, have opened offices in Oak Hill. Mr. Crawford, who will be the chief engineer at the Oak Hill offices, formerly was chief engineer for the Loup Creek Collieries Co. at Page, and has had 12 years' practical experience in addition to his courses in civil and mining engineering.

The Diamond Fuel Co., in the Scotts Run field, has posted notices at its Liberty plant that hereafter the 1917 wage scale will be paid. Fifteen families were evicted during the first ten days of October. Although a number of men and women have congregated around the plant since the company first posted notices, there had been no outbreak of any kind at last reports. Six companies in this field either have resumed operations on an open-shop basis or are preparing to do so. They are the Diamond Fuel Co., the Continental Coal Co., Bunker Coal Co., Shriver Coal Co., Brady-Warner Coal Corporation and the Chaplin Collieries Co.

## CANADA

Nanaimo, B. C., is this year's winner of the Montizambert Cup, emblematic of the Canadian first-aid championship. Second, third and fourth positions were taken by Coleman, Alta.; Montreal, and Ottawa, Ont., respectively. In the Coderre Cup competition, open only to miners' teams, Nanaimo took second place, first honors having been won by Canmore, Alta. Another notable victory for Nanaimo was in the Wallace Nesbitt provincial junior competition. Fernie, Trail, Vancouver and Victoria followed in the order named. For the Lady Drummond Challenge Cup the Nanaimo ladies' first-aid team carried off second honors, being outpointed by representatives of the City of Montreal. The Ottawa ladies were third. The prizes were presented by Lieutenant Governor W. C. Nicholl.

Coal production in British Columbia, while not as heavy as in previous summer seasons because of the strike in the Crows Nest Pass, has been maintained at a fairly high level in the

Vancouver Island and the Nicola-Princeton fields. In June it was 135,872 tons; in July 146,217 tons and in August 131,284 tons. That the output should have advanced in July and dropped in August is a little out of the ordinary and is hard to account for. Statistics for the months of July and August show that the production of the Canadian Collieries (D), Ltd., and of the Western Fuel Corporation, Ltd., the two largest collieries of the island, has fallen to the extent of some thousands of tons. Other island collieries, however, have been advancing their output slightly, chief among these being the Granby Collieries and the Nanoose Collieries. The July output in the Nicola-Princeton District was 18,788 tons while that of August was 17,565 tons.

The mine managers of the Dominion Coal Co., Ltd., of Glace Bay, N. S., that are to make an educational trip through the principal coal-mining districts of Pennsylvania, West Virginia and Illinois are Daniel J. McCuish, manager of Dominion No. 1B mine; Billy S. McDonald, manager of Dominion No. 2; J. R. Dinn, manager of No. 4, and Tom J. Casey, manager of No. 11 mine. They will start on the trip within the next two weeks. The proposal of J. E. McLurg, vice-president of the British Empire Steel Corporation, Ltd., with the co-operation of Harry J. McCann, general manager of coal mines of the Dominion Coal Co., Ltd., to inaugurate a series of educational trips for representative men of the various departments of the steel company and the coal company, and associated companies, was well received by the general personnel of the corporation.

Total output of coal from Canadian mines during 1923 was 16,990,571 net tons, as compared with 15,157,431 tons in 1922, or an increase of 12 per cent, according to the official government report just issued. The previous high record, 16,946,764 tons was made in 1920. The value of the coal output in 1923 was \$72,058,986, or an average of \$4.24 per ton. Higher values were recorded in 1920 and 1921. Compared with 1922, the 1923 total value was an increase of \$6,540,489. Alberta had an output of 6,854,397 tons; Nova Scotia followed with 6,597,838 tons, while British Columbia produced 2,823,306 tons. The latter province and New Brunswick, which accounted for 276,617 tons, showed slight decreases from the quantities produced in 1922. Saskatchewan increased its production to 438,100 tons during 1923.

## Trade Literature

**Hi-Test Sucker Rods.** Marion Machine Foundry & Supply Co., Marion, Ind. Folder describing the different rods manufactured by this company.

**Blacker Hammers.** Blacker Engineering Co., Inc., Grand Central Terminal, New York City. Pp. 8; 7 1/2 x 10 in.; illustrated. These hammers travel over the anvil face, performing hand-forging operations and utility smithing without helpers.

**Little Giant Electric Hammer Drill.** Chicago Pneumatic Tool Co., 6 East 44th St., New York City. Bulletin 896. For use in drilling concrete and soft stone as well as for light chipping of metals. Equipped

with a Universal motor and will operate interchangeably on direct or alternating current. Illustrations of the drill are shown in this two-page bulletin.

**Walter A. Zelnicker Supply Co.,** St. Louis, Mo., in Bulletin 326, gives information on rails, including switch material and track accessories; cars, locomotives, shovels, cranes, etc.

**"National" Pipe for Power Plants.** National Tube Co., Pittsburgh, Pa. Pp. 51; 8 x 11 in.; illustrated. Among the data included are standard specifications for power piping; weights, dimensions, etc., of various classes of pipe and fittings; information on bends, pipe columns and hand railings; articles on steam, superheated steam and flow of steam; tables of various data of interest and help to those engaged in power-plant design and operation.

**Automatic Station Control Equipment.** General Electric Co., Schenectady, N. Y. Bulletin 47,731. Pp. 27; 8x10 in.; illustrated. Briefly describes the uses and advantages of this type of equipment. List of installations up to Jan. 1, 1924, is included, giving names of companies, stations, types of apparatus, kilowatt capacity and incoming and outgoing voltage.

**Turbo Waughammer, Model 37.** Denver Rock Drill Mfg. Co., Denver, Colo. Pp. 15; 6 x 9 in.; illustrated. In addition to fast drilling, ease of handling and ability to drill deep holes in any class of ground, this hand hammer, on account of its unusual rotative power, due to the drill still being rotated independently of the hammer action, eliminates the danger of "stuck steel."

**The Automatic Control of Combustion.** Carrick Engineering Co., Chicago, Ill. Catalog 99. Pp. 32; 8 x 11 in.; illustrated. Discusses automatic control methods and systems, bringing out the limitations of the various systems and why they fail. Analyzes the conditions to be met in coordinating supply of steam with the demand and gives some interesting charts of steam pressure.

**Systems for the Automatic Control of Combustion.** Carrick Engineering Co., Chicago, Ill. Bulletin M. Pp. 16; 8 x 11 in.; illustrated. Complete specifications, together with diagrams and list of equipment required for thirty-three distinct methods of automatically controlling boiler-room equipment, are given. Thirteen different methods of controlling powdered coal are included. Each method is illustrated and described and the apparatus necessary listed.

## Recent Patents

**Coal Spreader;** 1,491,401. John W. Himmelsbach, Chicago, Ill. April 22, 1924. Filed May 31, 1923; serial No. 642,452.

**Flotation Process;** 1,491,863. Thomas A. Janney, Garfield, Utah. April 29, 1924. Filed Oct. 21, 1920; serial No. 413,466.

**Pulsating Jig;** 1,491,870. Martin J. Lide, Birmingham, Ala. April 29, 1924. Filed Oct. 18, 1920; serial No. 417,783.

**Conveying Apparatus;** 1,492,078. Nils D. Levin, Columbus, Ohio, assignor to the Jeffrey Mfg. Co., Columbus, Ohio. April 29, 1924. Filed Dec. 1, 1922; serial No.

**Coal Chute;** 15,839. John E. McMinn, Louisville, Ky., assignor to Peerless Mfg. Co., Louisville, Ky. May 13, 1924. Filed Oct. 5, 1923; serial No. 666,860.

**Coal-Washing Apparatus;** 1,493,510. George W. Wilmot and Francis H. Blatch, Hazleton, Pa., assignors to Wilmot Engineering Co., Hazleton, Pa. May 13, 1924. Filed June 14, 1922; serial No. 568,124.

**Coal-Mining Machine;** 1,493,701. Richard T. Quaas, New York, N. Y. May 13, 1924. Filed March 30, 1920; serial No. 369,921.

**Safety Mining Needle;** 1,493,823. Andrew Palsha, Ashley, Pa., assignor of one-half to Thomas Henichek, Jr., Ashley, Pa. May 13, 1924. Filed Feb. 14, 1924; serial No. 692,723.

**Expansion Coal Cutter;** 1,494,274. James G. Morgan, Wilkes-Barre, Pa. May 13, 1924. Filed Aug. 2, 1921; serial No. 489,169.

**Mine Switch - Operating Mechanism;** 1,495,283. Harry W. White and Wm. J. Galbraith, Stonington, Ill. May 27, 1924. Filed Feb. 9, 1924; serial No. 691,745.

**Mine Shaft;** 1,495,352. Edward O'Toole, Gary, West Va. May 27, 1924. Filed Feb. 20, 1923; serial No. 620,248.



## Traffic

### Indiana Chamber to Fight On For Lower Rates

A second strenuous fight for lower and equalized freight rates on coal shipments is to be made by the Indiana Chamber of Commerce in behalf of Indiana manufacturers and other coal consumers. Testimony in the chamber's second eastern bituminous coal case will be heard before an examiner of the Interstate Commerce Commission at 10 a.m. Friday, Nov. 28, in the Federal Building at Indianapolis. All railways carrying coal to Indiana consumers from mines in Kentucky, Tennessee and West Virginia are named as defendants.

The State Chamber was led into taking up the fight for Indiana consumers by the action of manufacturers of the Kalamazoo and Grand Rapids (Mich.) belts, who brought action for a cut in coal rates that would assure them rates equal to those enjoyed by Toledo, Jackson and Detroit, it was said.

Indiana and Illinois coal-mine operators have intervened in the new case, which, the chamber promises, in the end will be for their better interests.

### Finds Indian Creek Valley Ry. Rates Unfair

Contentions on the part of the Indian Creek Coal & Coke Co. have been upheld by Interstate Commerce Examiner Fleming, who recommends that the commission find that existing rates from points on the Indian Creek Valley Ry. to Eastern and New England destinations are unduly prejudicial. Examiner Fleming proposes that the commission issue an order that rates from mines on the Indian Creek Valley Ry. "are and for the future will be unduly prejudicial to the complainant and other coal operators on that line and unduly preferential to the competitors of these operators in the Meyersdale region [Somerset County, Pennsylvania] to the extent that they exceed or may exceed the rates on like traffic contemporaneously maintained from the Meyersdale group to the same destination."

## New Companies

The Blue Banner Coal Co., of Jackson, Ohio, has been incorporated with a capital of \$10,000 to mine coal and deal in coal and coke. Incorporators are David Armstrong, Allen M. Rowe, Arthur L. Rowe, John M. Martin and A. J. Welch.

A Dominion charter has been granted the Northwest Coal & Iron Co., Ltd., with headquarters at Toronto. The company, which has an authorized capital of \$1,000,000, will carry on business as coal and mining operators. The following are named as incorporators: J. J. Butterfield, Edmonton; A. D. McDougall and F. H. Honeywell, Ottawa; S. G. Butterfield, Riverdale, Md., and E. C. Taft, Alliance, Ohio.

R. A. Brown, in association with some well-known operators of the Harrison County field, has organized the R. A. B. Coal Co., the headquarters of which are at Morgantown, with a capital stock of \$50,000, with a view to operating in northern West Virginia counties. Associated with Mr. Brown in the new concern are W. S. John, of Morgantown; V. E. Gocke,

Katherine Gocke, and Maud Brown, all of Clarksburg.

The Cameo Coal Co. has been incorporated in Henryetta, Okla., by R. R. Fretwell, of Henryetta, and E. R. Jones and L. W. Randolph, of Muskogee, Okla. The capital of the company is \$10,000.

The Combined Coal Co., a co-operative concern has been organized at Crooksville, Ohio, by 16 miners with a capital of \$42,000. The company has leased the Cres Mar mine, near Crooksville, which is a going concern. George Appleman is president; Harvey Smith, vice-president; and Fred Reed, secretary-treasurer.

The following coal companies were recently incorporated at the State Department, Harrisburg, Pa.: Lincoln Coal Co., of Scranton; capital stock, \$60,000; incorporators, David M. Thomas, 1134 Van Deventer Boulevard, Scranton, treasurer; David Lloyd, Scranton, and Herbert L. Williams, Scranton. Crafton-Ingram Coal Co., Crafton, \$25,000; incorporators, S. Harvey Fisher, 21 Hawthorn Avenue, Crafton, treasurer; William L. McCoy, Ingram, and Joseph A. Pannabaker, Ingram. M. K. Piper Coal Co., Kregar, Westmoreland County; \$100,000; incorporators, W. L. Piper, Lilly, treasurer; M. K. Piper, Lilly, and J. William McCauley, Lutherville. The Bituminous Coal Co., Inc., Philadelphia, \$25,000; incorporators, William F. Ehlers, 4372 Manayunk Avenue, Philadelphia, treasurer; Miriam S. Cramp, Philadelphia, and W. E. McCall, Jr., Bryn Mawr. The Clymer Moshannon Coal Mining Co., Clymer; capital \$20,000; incorporators, Charles E. Faust, James St. Clair, Peter Harr, Clymer.

## Association Activities

The Alabama Mining Institute held its annual meeting at the Hillman Hotel, Birmingham, Oct. 7. The annual reports of Frank Nelson, Jr., president, and James L. Davidson, secretary of the Institute, reviewed the work of the past year and revealed material progress in the aims and activities of the organization. The election of three directors to replace a like number whose terms expired resulted in naming Carr McCormack, of the Pratt Consolidated Coal Co.; J. L. Brierton, of the Central Iron Co., and Milton Fies, of the DeBardeleben Coal Co. Officers for the ensuing year will be named at a later meeting of the directors, the present officials probably serving for another year.

## Obituary

W. A. Garrett, chief engineer for the Bellick Knob Coal Co. at Meadow Bridge, W. Va., was instantly killed in an automobile accident early in October. Mr. Garrett was on his way to Charleston, where his family lived, when his car skidded on a muddy road and went over an embankment. Mr. Garrett, who was 46 years of age, is survived by a wife and eight children. Interment took place at Clendenin.

Henry Tennington, age 60, well known coal operator of Glen Campbell, Clearfield County, Pa., died in the Clearfield Hospital on Sept. 27. He was a native of Clearfield County and was interested for many years in mining in Clearfield and Cambria Counties.

## Coming Meetings

Illinois Mining Institute. Annual meeting, Nov. 22, Elks Building, Springfield, Ill. Secretary, Martin Bolt, Springfield, Ill.

American Society of Mechanical Engineers. Annual meeting, Dec. 1-4, Engineering Societies Building, 29 West 39th St., New York City. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

West Virginia Coal Mining Institute. Annual meeting, Dec. 2-3, Welch, W. Va. Secretary, R. E. Sherwood, Charleston, W. Va.

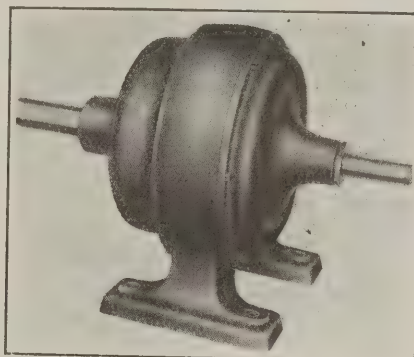
Coal Mining Institute of America. Annual meeting, Dec. 3-5, Chamber of Commerce Bldg., Pittsburgh, Pa. Secretary, H. D. Mason, Jr., Box 604, Ebensburg, Pa.

West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers. Fourth annual convention, Dec. 12 and 13, Huntington, W. Va. Secretary-Treasurer, Herbert Smith, Huntington, W. Va.

## New Equipment

### Speed Reducer with Novel Features

High-speed turbines and motors, which are rapidly coming into general use because of their compactness and economy, require a speed reducing mechanism when driving low-speed machinery such as compressors, generators, refrigerating machines, pumps, conveyors, crushers, etc. The ideal speed reducer should transmit the load



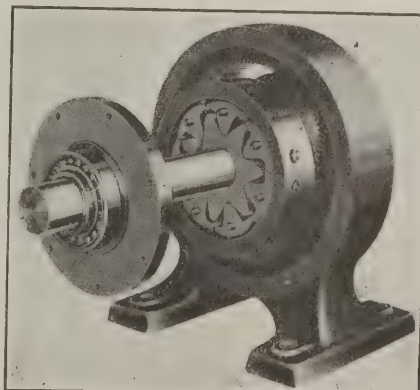
### Noiseless and Safe Speed Reducer

Housed where dirt and dust cannot get into the gears, the life of the reducer is greatly prolonged.

noiselessly, without shocks or loss of power, and should be compact and require little attention.

A speed reducer recently was developed by the Meachem Gear Corporation, 122-142 Dickerson St., Syracuse, N. Y., that meets these requirements in a novel manner. The load is transmitted from the high-speed shaft through planetary gears to a slower rotating annular ring. Inside this ring are connected a number of rockers which engage with a spider keyed to the low-speed shaft.

As the driving motor or turbine starts up, each of the rockers engaging with the teeth of the spider first compress a spring plunger which brings the bottom of the rocker into positive contact with the inside of the annular ring and at the same time brings its side



### Planetary Gears Transmit Power

Shocks are prevented by means of rockers which gradually pick up the load.



into positive contact with the side of the adjacent spider tooth.

During the time required to compress the spring plungers, corresponding to about one-quarter of a revolution, there is practically no load on the turbine or motor, and the load is then transmitted gradually and without starting shock. The spring plungers also serve to eliminate vibration and backlash, thereby assisting in promoting quiet operation.

#### PERFECT TORQUE ASSURED

The low-speed shaft to which the spider is keyed is supported on both sides of the spider. The pinion on the high-speed shaft is allowed to float and adjust itself to the proper position between the planetary gears, thus preventing side strains or unequal stresses and assuring perfect torque.

The speed reducer is totally inclosed, so as to be dustproof and foolproof, and all parts run in oil with forced lubrication on units operated at speeds above 1,800 r.p.m. The reducer can be applied to either step-up or step-down speed change, and is furnished in ratios from 4:1 to 200:1 and for any load up to 500 hp.

### Oil Circuit Breaker Meets High-Duty Requirements

A new line of outdoor oil circuit breakers has been placed on the market by the Condit Electrical Manufacturing Co., South Boston, Mass.

These are designed for 337,000-, 50,000- and 73,000-volt service, having standard capacities of 400, 600 and 800 amperes, and suitable for interrupting capacities as high as one million kva.

This new type breaker is constructed of steel and equipped with high-grade bushings and ample sized current-carrying parts, insuring a high degree of mechanical strength and providing exceptional insulating qualities. The highly-accelerated tripping mechanism and special contact design afford high-speed circuit interruption.

All breakers can be equipped with mechanisms for operation either elec-

trically or manually. The heavy-duty solenoid for operating the breaker electrically is inclosed in a steel housing with sufficient room for the relays generally used for overload protection. For automatic reclosing service, the automatic reclosing mechanism is furnished to operate either from direct or alternating-current circuits.

### Fan-Engine Regulator Controls Speed Automatically

The fallacy of the straight-line chart, of keeping boiler pressure constant, especially where there is a wide variation in demand, has been pointed out and

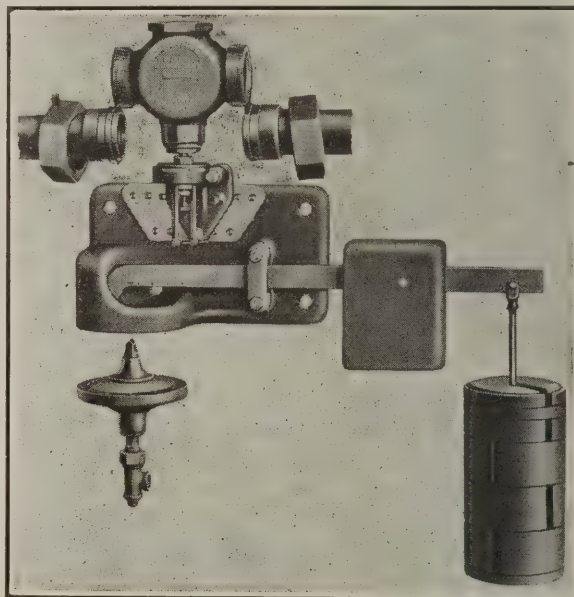
an improved fan-engine regulator that is extremely accurate and sensitive, controlled by varying boiler pressure and bringing about compensating changes in fan or blower speed smoothly and evenly.

#### DETAILS OF REGULATOR

In the illustration the boiler pressure connection and diaphragm, with a self-aligning hardened steel knife-edge bearing mounted on it, are unbolted and dropped down from their position in the device. Boiler pressure is at all times effective on the under side of the diaphragm. It is counterbalanced by the weighted beam which transmits the pressure change impulses through

#### Regulator Changes Speed Smoothly

The boiler pressure on the underside of the diaphragm transmits motion to the balanced beam, which is adjusted to the particular steam requirements. As the steam pressure changes the fan engine speed is regulated to deliver more or less air.



generally agreed upon. The exact amount of steam required to drive the fan engine or blower is seldom known and it is seldom clear just what exact change in boiler pressure should be required before the regulator is opened fully and the fan engine brought from normal to full speed.

With these ideas in mind the A. W. Cash Co., Decatur, Ill., has brought out

a link to the balanced valve which supplies steam to the fan engine.

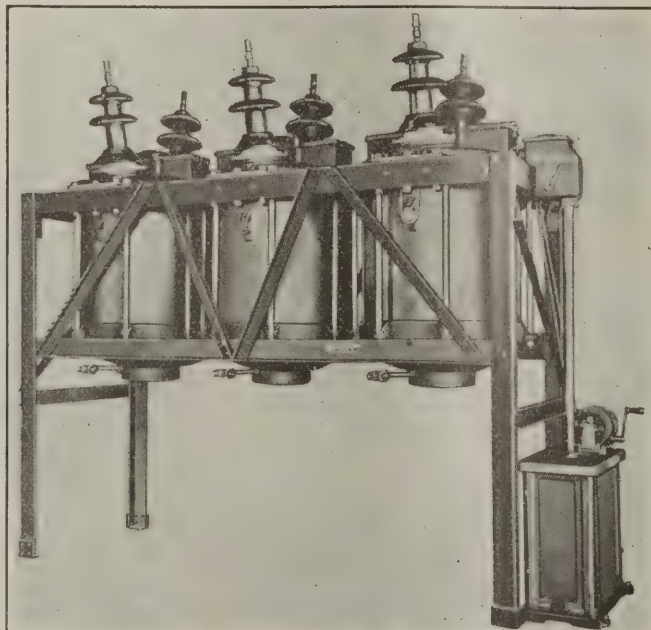
Any decrease in boiler pressure causes a downward movement of the beam, an increase in valve opening, and therefore a gradual, smooth pick-up in fan speed. An increase in boiler pressure decreases the valve opening and lowers the fan speed smoothly and evenly to normal fan speed when normal boiler pressure is reached. Each definite change in boiler pressure is therefore accompanied by a definite change in fan speed, which will be repeated every time.

Assuming that good engineering requires an operating range of, say, 6 lb. on a certain installation, if the desired normal boiler pressure is 180 lb., the fan engine should be idling at that point and for economical reasons should be brought up to full speed only when the boiler pressure drops to 174 lb., should it fall that low. There should be a lag between the boiler-pressure curve and the fan speed curve.

With this device the amount of valve opening for a given change in pressure may be determined by the position of the valve in relation to the beam. The valve connection may be shifted along the positioning pad and the connecting link connected to the beam at the corresponding hole. In this way a definite, fixed amount of valve travel may be established in relation to a definite, fixed and scientifically desirable change in boiler pressure.

#### Large Oil Breaker Ruggedly Built

This switch may be equipped with suitable apparatus to make it automatically reclose. It may also be arranged for manual or electrical operation. An indicator connected with the switch mechanism shows when the switch is opened or closed.





# COAL AGE

McGraw-Hill Company, Inc.  
JAMES H. McGRAW, *President*  
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Devoted to the Operating, Technical and Business  
Problems of the Coal-Mining Industry

R. DAWSON HALL  
*Engineering Editor*

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Number 17

## "Mud Slinging" That's Worth While

SOME OF OUR good friends who do not believe in "mudizing" are disturbed lest *Coal Age* advocate this "silly slopping around of dirty water" in mines. They shouldn't become so exercised until the coal industry learns more about this Rocky Mountain development in mine protection against coal-dust dangers. We are not prepared to say that "mudizing" is the thing, and neither is anyone else, not excepting even the developers of the process. However, no mining man who sees the results goes away condemning it.

We are willing, at least, to say that it is advantageous that so much attention has been centered on the rock-dusting problem that this new scheme was conceived. That, in itself is a wholesome symptom for coal mining. As to "mudizing," there is no denying that it has virtues. The thin mud mixture fills crevices and rounds off tiny ledges, thus positively reducing the opportunity for coal dust to collect. That alone is enough to make it a valuable practice, especially in dry mines. Perhaps "mudizing" will form so effective a base upon which to build a dry dusting system, that it will win its way into every well protected mine. At any rate exhaustive experiments with mud should certainly proceed. The coal industry should quickly learn all there is to know about this practice.

## One More Laugh

MR. PIN CUSHION, the gifted editor and publisher of the weekly *Squirt*, issued as second-class matter at Washington, D. C., under the pure food and drugs act of June 30, 1908, is all worked up again. The Canadian Government is about to take 20,000,000 tons of coal business in the eastern provinces away from American producers and give it to the Canadian mines by guaranteeing to just about pay the freight on the coal if the mines can't sell it any other way.

Would you believe it? Pin can prove that this is all Mr. Hoover's fault. Mr. Hoover's Department of Commerce which, Pin grieves to say, will receive \$3,400,000 this year with which to pay its useless expenses, has "been foster father to the very regulatory proposals which frightened Canada out of our markets," so Pin says. Therefore Canada fears it cannot depend upon the United States for a regular supply any longer. So it will depend, rather, upon its own Maritime Province mines. Just how a subsidy of five mills per ton—or "just about enough to pay the freight"—is going to keep those wild-eyed miners in eastern Canada on the job is too thick for us. But never mind. That's the case anyhow. Pin has spoken and Mr. Hoover is to blame for everything; take Pin's word for it.

What surpasses our mediocre understanding is this: Why has Mr. Cushion been so ready to figure out crimes to charge against Mr. Hoover? All Mr. Hoover ever did was to shut the door of the Department of Commerce to a man who would not be square with ideas

Mr. Hoover expressed in interviews. So why all this hectic flush every week? Well there is one good reason. The coal industry likes a laugh as well as anybody.

## More Permanency; Less Make-Shift

IT IS A regrettable fact that most electrical and mechanical installations and repairs made inside the mines are carelessly done. Some men often say, "It's good enough for the mines," whenever a job is criticised as being unsatisfactory, or executed in an unworkmanlike manner.

The use of more machinery and larger quantities of electrical apparatus is economically demanded by the mines of today. Each new piece of equipment makes everyone from the miner to the official more dependent upon its successful operation. When a motor, pump, controller or even a signal fails, someone usually must stand by idle. Occasionally the failure of even a small piece of equipment will shut down a whole mine.

Poorly installed apparatus is always a liability; dangers and accidents multiply when machinery that is loose, improperly installed and in disrepair is allowed to be operated. Savings theoretically attainable are often lost because a machine has been incorrectly assembled.

Most companies need to standardize some of their apparatus and to employ men who realize the growing dependence of the entire organization and plant upon the mechanical and electrical equipment installed. The days of makeshifting are about ended.

## Now It Can Be Told Best

WE NOTE WITH REGRET the collapse of many sectional plans for "coal institutes" which were going to tackle the job of educating the public about coal. The truth about its production and training in its economic consumption are two classes of facts the public ought to have. As J. C. Brydon said, when he retired from the presidency of the National Coal Association last spring, "The public's interest in coal seems quiescent just now but it might become active at any time." Just so. By the time the next Congress assembles at Washington, a rebellious sentiment in that body might well be active enough to force through destructive coal legislation, unless public sentiment is against such action.

Some contend that it is well to let the public forget the subject entirely and that, therefore, the less said now the better. To us this seems like clinging to public-be-damnedism. The more the people of this country know about coal all the way from face to furnace, the better. If there is anything it should not know, that thing ought to be trimmed out of the industry at once, if not sooner. We believe the truth about this industry can profitably be told and that it ought to be told now above all other times.

In years gone by, every time the industry has made



a concerted effort to tell the public about coal, the economic and political situation was such that coal was in ill repute the country over. Therefore, the lesson in coal was offered just when public acceptance was hardest to win. Why wait until the industry is on the defensive? That isn't good salesmanship. Why reserve all our selling effort for a time when the salesman has to break down the customer's locked door in order to get his all too hostile attention? He can walk in with a smile now, because the price of coal never was lower, considering the cost of production.

"But we can't afford it today," says a big part of the suffering industry. We admit that is a reasonable plea. But which is the better business policy: Spend a little money and effort continuously to prevent the regular and inevitable recurrence of fire, or wait until it roars down upon us and then throw in ten times as much for protection and maybe lose it all?

### Coal Claims Credit

COAL has a perfect right to claim credit frankly for aiding materially in the autumn industrial prosperity. And it ought to do so. It always has been easy for the country to blame assorted industrial ills upon high coal prices. Let the country now recognize the fact that, in proportion to the cost of production, coal has never been cheaper than in 1924. There is no better gage of the trend of coal prices than *Coal Age* index which is computed each week from the spot prices of fourteen principal American coals on the main markets of the nation "weighted" with respect to sizes and volume of production. The average coal price this week is \$2.12. A year ago this price was \$2.25. On Aug. 4, when summer conditions still prevailed, it was \$1.98; on April 1 it was \$2.09 and on Jan. 1, \$2.17. Not since before the war has the country seen such low prices.

A wise and well-known coal operator, talking before the executive heads of a great coal-consuming industry in Chicago last summer, remarked that great industrial advances the world over have been based on low-priced fuel and that the coal operator today recognizes that low-priced coal is necessary henceforth in this country. He said, however, that the operator cannot continue selling his product below the cost of production for that would rot the foundation of all industry.

This man admitted that all too little progress has been made in the past in cost reduction. This he said, has been chargeable largely to labor opposition and discouragingly unprofitable operation of coal mines. What he said is true, but he could have said more. He could have reported that never before has there been so much intense effort devoted to improving mechanical methods in coal mines as in 1924. Industry is bound eventually to profit by it in lower costs. In fact there are already instances where costs per ton have been reduced as much as 25c. Never has there been a year in which union labor has had so severe a lesson in the short-sightedness of its policy of obstructing cost-cutting machinery. Perhaps it may change this policy now.

It is true the coal operator has no big 1924 profits with which to develop cost-cutting machinery and methods; he is being driven to it, instead, by desperate fear of destitution. So, even before union miners' wages are reduced, the industry is working steadily toward lower cost fuel and is thus performing a duty to the nation without "taking it out of labor."

### A Union Man Says It at Last

DOWN in western Kentucky is Lonnie Jackson, for years a stalwart labor leader and, until now, president of District 23, United Mine Workers. Nobody ever successfully accused him of being anything short of a loyal fighter for unionism. So unionism has persisted in his own region—Muhlenberg County—while it was collapsing everywhere else in western Kentucky. One reason for this was that coal operators knew Lonnie Jackson to be fair, square and sane. They were willing to deal with such a man. And they are willing now. But unbending adherence to the Jacksonville agreement makes it impossible. Lonnie Jackson says:

"I do not believe in an organization taking the stand that there will be no backward step regardless of circumstances. I believe that facts and figures should be governing factors in fixing wage scales at all times. This is my conception of the trade union movement or collective bargaining. Labor organizations should demand what they are entitled to at a time when conditions are favorable and they should be willing to grant concessions when things are unfavorable and if any district is suffering on account of inequality it should be taken care of through wage negotiations."

Talk such as this is not pleasant in the ears of President John Lewis. It is too true. And it is not pleasant for him to hear Lonnie Jackson say flatly: "Day by day I have seen mines go non-union. I have seen non-union tonnage soar to an alarming extent. I have seen operators, who were always willing to sign contracts with the United Mine Workers, permit their mines to flood because they cannot sign an agreement that will not permit them to compete with non-union tonnage." Jackson knows that "it will be the duty of the officials of our organization as long as they work and receive pay therefor, to oppose what I am saying . . . but I am endeavoring to put before the miners and the public the facts as they appear to me. I am conscientious and I do not fear the result, whatever it may be." And there the case stands.

There isn't much for President Lewis to do or say in reply. He knows this man speaks the truth. But his own hands are tied effectively. He cannot advocate a reduced union wage in western Kentucky, because if he did he would be sacrificing his locals in Illinois and other competing fields—that is, unless he agreed also to a cut in Illinois and the whole domain of unionism. And if he did that right now he would be doing a futile thing. He probably would fail to get the reduced scale accepted and he certainly would succeed in getting himself rushed out of a job. Such is the psychology of the union miner. No "backward step" can be taken until the rank and file demands it, and that may not be until next summer. Till then, at least, conditions must remain *in statu quo*.

For the time being, everybody is right. Lonnie Jackson is right in advocating a cut, just as the Alberta union miners were right this month in accepting a reduction rather than be sacrificed by the international. President Lewis is right because union politics will not permit him to do what he knows should be done. So the confused situation must remain confused—while sections of union territory go non-union or reject headquarters control—until action is initiated by the rank and file. That action is a little closer because such men as Lonnie Jackson have begun telling the union the truth.





Coal Getters

## Is the Payroll Dollar Worth the Mine Dollar?

Many Executives Do Not Realize That Wages Are Invested  
— The Wage Dollar Should Pay Dividends — Human  
Engineering Is as Indispensible to Success as Mining Engineering

BY H. J. GROSSMAN  
Cleveland, Ohio

ONE OF THE principal sources of loss to the coal industry is the mistaken idea held by most executives that the "mine dollar" is greater than the "payroll dollar." In other words, a great many executives think that the money invested in their mines and equipment should be more carefully watched than that which is paid out to employees in the form of wages. Either they do not realize that the money spent in this way forms ultimately a far larger investment than that put into mine and equipment, or else they choose to ignore this fact. The result is waste which is passed on to the ultimate consumer in the form of increased mining costs and higher prices.

Not only do most executives fail to realize that investment in payroll—wages—is ultimately a much bigger investment than that in plant and equipment but they also fail to realize that it is fundamentally a more important investment as well. On the average, business cash invested in payroll will exceed cash invested in mine and equipment within two or three years. Even in the largest enterprises the former investment will exceed the latter within five years.

It is impossible to evade the fact that every wasteful practice in the mining of coal is translated into cost. This cost becomes a direct burden on the consumer in the form of higher prices, if a profit is to be made on the output of the mine.

In contributing to this waste and the resultant higher cost of production, some important factors are: the impurities loaded on the cars in the mine and

eventually shipped to the consumer, careless handling or rough treatment of tools and equipment, absenteeism and "idle days," restriction of production, opposition to labor-saving devices, uneconomic restrictions, strife and friction, and the like. Much of the waste complained of is due to the attitude of the executives toward their employees and of the employees toward their jobs. Perhaps a larger portion of it may be charged against the attitude of the executives than against the attitude of the employees, for it is upon the former that the latter largely depends. In other words, if executives insist upon giving 95 per cent of their attention to the mechanical side of the business and only 5 per cent to the human side, they have little to complain about if their employees give 5 per cent of their attention to their jobs and 95 per cent to their personal interests. Regardless of what percentage of attention the employees give to their jobs, however, it is obvious that sooner or later any inattention will be reflected in waste.

### CO-OPERATION IS THE ONLY ADEQUATE SOLUTION

The question of how wastes and the losses they produce may be lessened in a substantial way, if not prevented entirely, may be answered with a single word—co-operation. The task of obtaining co-operation, however, is by no means simple. Some employers have tried to obtain it by placing industrial spies in their plants to report delinquent employees, who are discharged; but they have failed. Other employers have striven for co-operation, their various activities being classified under the head of welfare work. They have tried to win the co-operation of their employees by giving them something; and they also have failed.

NOTE—Men, after all, are the greatest assets that a coal company can have. The headpiece shows a group of miners waiting at the shaft bottom to be hoisted to the surface. This is the raw material with which the human engineer in the mining industry has to work.



This naturally brings up the question as to how co-operation really can be obtained. In a negative way it may be answered by saying that it can rarely come from the inside of the organization, because the average executive is unable to analyze the motives that control his employees. To do this properly and effectively it is necessary to approach the matter from an "outside or detached" (not disinterested) viewpoint. The executive himself, being on the inside, the viewpoint is denied him. In a word, it is a case for the trained "man engineer."

Let us cite a case in point. In it figured a mine equipped with the most efficient machinery, labor-saving devices, plentifully equipped and engineered, yet unable to produce coal at a profit. A survey of conditions in the mine showed an antagonistic attitude on the part of the employees toward the management. This resulted in their opposing the purpose of the equipment and

Unnecessary driving tactics indulged in by those charged with supervision also materially adds to the mining cost through expensive labor turnover and increased antagonism from the workers. This feeling expends itself in opposition to the management's interests. Education of the foremen along similar lines, supplemented by a strongly applied constructive policy will eliminate these losses accruing from the supervision. It is all a case of determining motives and working up the spirit of co-operation through understanding.

#### CO-ORDINATION REDUCES PAYROLL LOSS

The annual payroll loss in some mines is almost unbelievable. In a large operation the payroll was found to be sustaining an annual loss of 25 per cent of the total wage disbursement. By developing a greater degree of co-ordination and constructively



#### Those Who Actually Produce Coal

Color makes little difference in loyalty. The important consideration in any industrial enterprise is morale. This may be intangible, incapable of measurement or appraisal, yet it is none the less highly important. The loyalty of even such men as these roof-brushers is well worth securing by the management of any mine.

labor-saving devices, thereby restricting production, and causing great losses and wastes. They had been educated by outsiders to believe that these practices were to their interest.

An intense educational effort in the simple economics of the situation, developed a comprehension of the fallacy of their previous methods and practices. This resulted in the economical and cleaner mining of coal, which permitted the operator to offer a price inducement and to extend his area of distribution, thereby providing more stable employment under more agreeable conditions for his workers. The secret was the "outside" or analytical viewpoint and the educational method practically applied. Thus success was achieved through enlisting the co-operation of the employees and their interest in their work to a point where they had a fair understanding of the identity of interest. The executives of this mine had been neglecting its greatest asset—the goodwill and understanding of their workmen.

molding the employees, as well as the foremen and contractors to the proper appreciation of their responsibility and to an understanding of simple economics, the greater part of this loss has been recovered.

That the minds of mine workers are not closed to developments of an economic nature is proven by an experience recently had in a non-union operation. Although the mine was operating more or less continuously under a reduced wage scale, the conditions of the coal market plainly indicated a curtailment of output. Realizing that a reduction in price would stimulate sales, and that they would be far better off working for a slight reduction five days a week than one or two days a week at a higher scale, the miners made their views known and graciously accepted the reduction in wage. No doubt when orders are again plentiful they will promptly receive a substantial increase from this constructively inclined operator.

In undertaking the reduction of mining losses, sight must not be lost of that fact that every working force



### Common Ground

First aid training in most cases has done far more than teach men how to apply bandages—it has taught them how to meet and appreciate each other. When employee and employer meet in a common cause, differences of opinion are apt to be forgotten. Nothing welds people together more firmly than to work for a common objective or to play on the same team.



is made up of three types of employees—conservative, radical and neutral. Analysis of mines and plants in more than 50 industries has shown that, in a group of 100 typical employees, 10 per cent are conservative, another 10 per cent are radical and the remaining 80 per cent are of neutral motive.

There is no loss on the payroll dollar of the first group, because the employees in it return a full day's work for the wages they receive. The radical-motive group will produce only 50 per cent of a full day's work, with a consequent loss of 50 per cent of the wage investment in them. The 80 employees in the neutral-motive group produce only 75 per cent of a full day's

work, and there is a loss of 25 per cent on their payroll dollar. The net result is, in this case, which is typical, a loss in productive value of 25 per cent of payroll investment per hundred employees.

Appreciation of science in machinery and mining engineering is essential in the coal industry but, unless the good-will of the employees can be obtained, no system will earn satisfactory dividends. The co-operation of the mine workers can be had by any employer who will meet them half way. The viewpoint of the employee is the most neglected factor in our modern mining industry. It deserves far greater consideration than it now receives.

### A Reliable Crusher Installation

At a certain mine in Illinois a ring crusher was installed about three years ago. This machine is driven by a 50-hp. motor and is used to reduce large coal to stoker size. Since its installation it has crushed a total of 240,000 tons of coal, some pieces being as large as 2 ft. chunks. On the average about 1,100 tons of fuel are passed through this machine each shift.

Thus far no repairs whatever have been necessary on this machine. Expense of operation, including interest, depreciation, etc., amounts to \$13.39 per day, which brings the cost of crushing to 1.2 cents per ton. Many coal mines during recent years have installed crushers so as to be able to supply stoker fuel to the trade whenever the demand for this grade is strong. The results obtained in this installation in Illinois show how reliable these crushers can be made.



The Ghost Car of the Rocky Mountain Region

The United States Fuel Co., with headquarters in Salt Lake City, Utah, operates the only white coal car in captivity—and only one. This car, which shines out like Little Eva among the Tops'es and the Simon Legrees of coal traffic, is used as an advertising feature for "King" coal. It makes trips here and there among the customers of the company, attracting attention wherever it goes. In this photograph, it stands in the load yard of the Blackhawk mine at Hlawatha, Utah.



# How Dangerous Ground Currents Were Prevented And Confidence of Workmen Regained\*

Stray Currents Were Eliminated from Shaft and Equipment by Interconnecting Cables—Leads on Firing Caps Should Be Short Circuited Until Used—Damaged Blasting Cables Must Be Replaced at Once

BY EMORY E. JONES

Electrical Engineer, E. E. White Coal Co., Statesbury, W. Va.

IN THE LATTER part of 1922 a shaft was sunk on the property of the E. E. White Coal Co., at Statesbury, W. Va., to the Pocahontas coal beds Nos. 3 and 4. When the shaft had been sunk to a depth of about 65 ft., a premature explosion occurred in the following manner: A sumping shot of eighty sticks of dynamite had been prepared and connections made to an electric blasting circuit of 250 volts direct-current located on the surface. Due to an open circuit in the blasting cable, which ran from the surface to the bottom of the shaft, the charge could not be made to detonate. As two men started to descend the shaft to locate the open circuit, so that the work could proceed, the charge of dynamite exploded. Fortunately, no one was injured, as the shot had been well placed and properly loaded, so that no rock was thrown to the surface.

It was now evident that conditions were extremely dangerous, and the cause of this premature explosion must be found and eliminated. The confidence of the workmen had been shaken and some of them refused to proceed with the work unless steam instead of electricity was used for hoisting and pumping purposes.

Because of the fact that all the equipment was electrically operated and the machinery for sinking had all been installed, it was practically out of the question to use steam. It was therefore evident that the cause of this explosion must be found and remedied.

It was known positively that the circuit leading to this charge of dynamite was open, and that the switch had been disconnected some time previous to the detonation of the charge. It was also believed that the shot had in some way been detonated by what is commonly known as a stray current.

## TESTS MADE TO DETERMINE EXACT CAUSE

A number of tests were made to determine the exact cause. In making these tests, first, all the switches were opened, and an ordinary electric blasting cap was connected between the compressed air line and the discharge line from the pumps located at the bottom of the shaft. The instant the connection was made the cap was fired. This showed that a sufficient difference of potential existed between these points to detonate an electric blasting cap. A connection was made between the air line going down the shaft and the ground adjacent thereto. Again the cap was fired, but not instantly, thus showing that there was not at all times sufficient voltage between these points to fire the cap. A connection was made between the electric hoist frame and the ground and the cap was fired instantly. A connection was made between the shaft bottom and a wet place near the surface and the cap was fired in a few seconds.

From these results it was evident that sufficient dif-

ference of potential existed between the places selected to fire blasting caps connected in an ordinary circuit in the shaft. To equalize the difference of potential existing at these various places, connections were made with heavy copper wire as follows: The frames of all the machines on the surface, and the pipe lines going down the shaft were electrically connected; holes were dug near the hoist and compressors, and ground connections were made by burying a coil of wire, and bolting the



Drilling a Hole by Hand

Whether the hole be drilled in rock or coal makes little difference—damp earthy materials form a conductor that may carry current of sufficient strength to set off a detonator. High-resistance joints in rails, gaskets in pipe lines and a hundred and one other things, not perceptible to the eye, may influence not only the magnitude of stray currents but their path as well.

connections to the frames of the machines; salt water was poured on these coils of wire to increase the conductivity, and earth packed over them to fill the holes and insure good contact with the ground.

Tests were then made with a millivoltmeter and no difference of potential greater than 100 millivolts could be detected between any two pipes, between a pipe and ground, or from the top of the shaft to the bottom of the shaft.

After these tests had been completed several blasting caps were given to the workmen, and a prize of \$25 in cash offered to anyone who could cause a cap to fire at any place except by the use of the blasting circuit. It was amusing to watch the efforts of the men to fire the caps, and the precautions used in case they should explode. Not being successful in their attempts it was noticed that some of the workmen believed that the caps handed to them were imperfect. They thought these caps to be "phoney." In order to dispel this suspicion each cap was connected to the blasting machine,

\*Paper presented before Mining Section of National Safety Council, Louisville, Ky., Oct. 2.





**Drilling a Shot Hole Electrically**

By what means a hole is drilled makes very little difference so far as stray currents are concerned as the real danger comes between the time of charging and the time of firing. Note, however, the rock band below this shot hole. It may have high resistance while the coal above and below it may have comparatively low resistance. Suppose that in inserting the cartridge and pushing it home one lead wire is scraped bare making contact with the coal and that the bare end of the other wire touches the damp floor. Then suppose that a stray current seeks passage from the coal to the floor. What will happen is obvious.

and fired, thus restoring the workmen's confidence, so that the work could proceed without fear.

The following rules were then posted regarding blasting, and rigid adherence enforced.

Rule 1. Explosives must be placed in an insulated container when being lowered down the shaft.

Rule 2. Not more two men may be in the shaft when shots are being prepared.

Rule 3. The muck bucket must not touch the bottom of the shaft during preparations for a blast.

Rule 4—The blasting machine must remain in the possession of the top man, and may be operated only by the man who prepared the shots, and then only in the presence of the top man.

Rule 5. The whole length of the shooting cable must be inspected daily. If a bare place is found, the cable must be thrown away and a new one secured.

There are obvious reasons for each of these rules. First, if the explosives are in an insulated container while being lowered down the shaft, there is no danger of an electrical contact being made. Second, if only two men are in the shaft during the preparation of the shot, it is certain that not more than two men could be hurt in the event of an accident. Third, if the muck bucket does not touch the bottom, there is no danger of stray currents radiating from it. Fourth, if the blasting machine is in charge of one man, one particular person is responsible for its safe keeping and if the man who prepares the shots is the only one allowed to use the machine, it is evident that no one will connect it until everyone is out of the shaft. Fifth, if a well-insulated blasting cable is used, and it comes in contact with any charged machines or pipe lines, the insulation will prevent leakage of current to the blasting cap.

Since the accident mentioned above some thought has been given the subject, and improvements made in the way of handling electric detonators, especially inside the mines. In the case of the E. E. White Coal Co. the miners are taught to twist the bare ends of the wires of the blasting caps together and keep them in this condition until they are finally connected to the

blasting circuit. This simply means that in case the wires of the cap come in contact with a source of current, the ends being short-circuited, there is no danger. Caps are always delivered to the men in paper sacks properly closed at the top so that the ends of the wires can not come in contact with any source of current. The men are taught to suspend blasting cables on wooden posts, and never allow them to come in contact with mine tracks. Blasting batteries are made in such a way that a connection to them cannot be made unless the cable is held in one hand and the battery in the other. Thus there is no danger of a workman leaving his battery connected to a cable and going to the face and attaching another cap. Accidents have happened where miners have left their cables connected to battery terminals and attached blasting caps at the charge.

To those who have studied electrolysis the subject of stray currents is a familiar one. Much study has been given this subject, and some electric railway companies have gone so far as not to use the rails or ground for return circuits at all, in fact, this is the case in Cincinnati. The danger here is not so much the premature explosion of shots but the electrolytic action on steel structures.

If an electric current is passed through a liquid from one metallic plate to another, electrolysis will take place; that is, metal will be deposited on the negative pole, and the positive pole will be dissolved. In an electric railway return circuit there is a difference of potential between parts of the system and the rails and other buried metals, such as pipe lines, steel structures, fire plugs, telephone cables and foundations of buildings. The amount of these differences of potential depends somewhat upon the energy loss in the return circuit, it varies with the amount of current flowing, and the resistance of the return circuit.

It is therefore evident that if pipe lines and buried pieces of metal are all connected together with low-resistance cables, these differences of potential may be practically eliminated. However, it is not so evident that different strata of earth are of relatively low resistance and sometimes separated by a stratum of comparatively high resistance. Nevertheless this accounts



**Loading a Hole**

When handled properly explosives are harmless: if handled improperly they "let go." The blaster must not only look carefully to the charge of powder itself but also to the detonator and its lead wires. Twisting the bare ends of these wires together forms an electrical connection between them and greatly lessens the danger of premature explosion. This process practically converts the leads from two separate wires into one continuous conductor with no opportunity for current to flow to the cap. Furthermore, joining the wires' ends keeps them together so that they are not likely to touch two points of appreciably different potential.





#### A Place to Begin to Control Currents

Unbonded or poorly bonded tracks are a continual source of danger and expense. Any current that leaves a generator must return by some circuit or another. If the rail joints present a high resistance the current will pass through the materials offering an easier path.

for differences of potential between earth strata. By the same token, where current is flowing through the earth, there are differences of potential between points on the surface, or between the surface and underground, depending upon the difference in their distances from the source of current the conductivity of the various strata of earth and the amount of current flowing. The first experiments in wireless depended upon this principle. When we consider the small amount of current necessary to fire an electric detonator, and the small amount of voltage required, it is evident that care must be taken not to allow the bare ends of the caps or bare places in the blasting cable to come in contact with conductors, especially pipe lines, steel rails, ponds of water, or wet places of relatively high conductivity due to mineral salts and acids.

It is strongly recommended that all electric blasting-cap wires be twisted together during the process of manufacture, thus minimizing dangers in the field should the wires accidentally come in contact with materials having a difference of potential between them.

The cables used for the purpose of electric blasting are usually poorly insulated and cheaply constructed. The insulation consists chiefly of cotton treated with paraffin. A great improvement could be made in this direction which would add to the safety of electric blasting. Manufacturers of electric batteries used for firing electric blasting caps can improve their construction by so arranging the batteries that no permanent connection can be made to them. This refers, of course, to the batteries used by coal miners, where only one cap is fired at a time.

For the benefit of those who wish to calculate the resistance of blasting circuits, I quote literally from J. H. Horlick, Jr., of the Hercules Powder Co., who very kindly furnished this information.

"The actual amount of current required to heat the bridge of our electric blasting cap sufficiently to set off the charge in the cap is approximately 0.4 amp. However, in actual blasting, and with more than one cap connected in the circuit, a greater current is recommended to take care of any slight variation in the bridges of the caps or of any leakage which may occur in the circuit, especially under damp conditions or in

metal-bearing materials. For various types of connections we therefore recommend the following currents:

1. For series connection, not less than 1.5 amp.
2. For straight parallel connections, not less than 0.6 amp. per cap in parallel.
3. For parallel-series connections where the caps are in series groups and the groups in parallel, not less than 2.0 amp. per series.
4. For series-parallel connections where the caps are in parallel in groups, and the groups in series, not less than 1.0 amp. per cap in the largest parallel group.

"Of course, it is quite possible to get satisfactory results with less currents than recommended above, especially when a number of caps are placed in the circuit. However, the above minimum currents are recommended so as to have some margin of power to take care of any irregularities in the circuit and provide greater assurance of all caps firing.

"With the necessary current determined, the required voltage then depends upon the resistance of the circuit. In this consideration it is important that the resistance of the entire circuit, and not that of the caps alone, be calculated. For instance, suppose we had a circuit consisting of ten 10-ft. No. 6 copper wire E.B. caps in series with 500 ft. of No. 14 copper wire to the source of power. The resistance of E.B. caps, of course, varies with the length and kind of leg wires, that of Hercules 10-ft. No. 6 copper wire E.B. cap being 1.50 ohms. Ten in series would therefore have a resistance of 15.0 ohms, while the 500-ft. of lead wire would have a resistance of 1.26 ohms. With the minimum recommended current of 1.5 amp. for this series circuit, the required voltage by Ohm's Law would be about 25 volts. For firing only a single cap, a current of only about 0.5 amp. would be sufficient to use in calculating the required voltage along the above lines, in which case about 1.5 volts would probably fire the 10-ft. copper wire cap. It is interesting to note that if a stray current should get through the cap wire insulation near the cap itself, thereby eliminating the leg wire resistance, a voltage as low as about 0.6 volt might fire the cap. However, for more than one cap in regular blasting circuits, we recommend calculations for required power based on more than merely theoretical required current, in order to more thoroughly insure the firing of all caps in the circuit."



#### Take No Chances With a Damaged Blasting Cable

Bare spots in a cable may touch a mine rail, charged conductor or a pipe carrying current and fire a charge. Inspect the cable every day and replace it with a new one if it is damaged.



# Equipment and Safety Methods in Alabama

Auxiliary Fan Drives Assure Reliable Ventilation—Rotary Dumps Discharge Whole Trip at One Operation—Mechanical Samplers Influence Coal Quality—Dust Laid by Washing Down Mine Surfaces

BY MILTON H. FIES

Vice-President, De Bardeleben Coal Corporation,  
Birmingham, Ala.

**V**ENTILATING furnaces are still in use generally at drift mines in Alabama where no power is available. This system is costly and inefficient. At practically all mines where power is available various types of fans are used. At some drift operations small fans of about 5,000 cu.ft. per minute capacity are employed; one machine furnishing air for one or two openings. At larger developments, where methane is generated, there are usually two drives to each fan. One of these is generally a motor and the auxiliary drive a steam, gasoline or kerosene engine.

At the No. 1 air shaft of the Woodward Iron Co. a No. 16 Sirocco fan has been installed. This is driven normally by a 150-hp. motor; the auxiliary unit consists of a 100-hp. Fairbanks-Morse kerosene engine. This engine is direct-connected to the fan shaft by a sliding jaw clutch. The motor is connected to the fan by a belt, the pulley being loose on the shaft but provided with jaws cast in the hub to engage a sliding clutch. In case of power failure, it is only necessary to throw out the clutch on the belt pulley, throw in the other clutch and start the engine.

The engine is started with compressed air from a receiver. This is always kept up to pressure by a small compressor that is driven by a 9-hp. gas engine. The entire change can be made in less than 5 minutes. Storage batteries are provided to furnish lights for the attendant at the fan in case of power failure. The layout of this auxiliary drive is shown in Fig. 23.

Both the continuous and split systems of ventilation are in use in the mines of Alabama. In the larger and better-equipped operations, the split system is prevalent. Concrete overcasts and stoppings made of mine rock, faced with a mixture of clay and cement, are found in the better-class mines.

## IN SOME MINES MUCH WATER MUST BE HANDLED

It has been found that as pillars are removed, particularly in the Warrior field, the cost of pumping increases greatly. In some of the Pratt mines, where pillars were robbed as the entries were driven to the boundary, from 10 to 15 tons of water have been pumped for each ton of coal produced. It is now the custom, at the larger operations, to extract not over 50 per cent of the coal as the mine advances, leaving large thick pillars. These are robbed as expeditiously as is practicable toward the end of the mine's life. The reduction in pumping by this method will be great.

In the Cahaba field, where all the beds pitch, pumping is a large item of expense, mainly because there are conglomerate and other porous strata above the coal measures. The drainage problem is simplified, however, by the ability to lead the water to a common point.

Methods employed in timbering vary greatly accord-

ing to the top, and no set principle is followed. The cost of timbering ranges from 1c. per ton to 7 or 8c., depending on the nature of the top and the accessibility of the timber. In recent years, the cost of timber has increased, through the exhaustion of the supply readily available. It is not uncommon at some mines to have the timber shipped in by rail or hauled 10 to 15 miles in trucks.

In the larger, better-equipped mines, slope and main haulage track is laid on sawed creosoted ties with 40 to 60-lb. steel. On cross entries, where mule haulage is used, the rail is 20 lb., but with locomotives it is 30 to 40 lb. Room rails vary from 12 to 20 lb. in weight.

In medium and steeply pitching beds, as a general rule, mules are used on all cross entries for gathering coal to the slopes. Where the pitch is from 0 to 5 deg. locomotives are employed almost entirely for gathering and main-line deliveries. Storage-battery and gasoline machines are used at a few operations and in a few cases endless and tail-rope haulage systems are found.

## BELT CONVEYOR USED AS A SLOPE HOIST

At one mine in Alabama, a belt is used for hoisting coal up a slope. This conveyor operates on a pitch of 19 deg. 53 min. The belt is 4 ft. wide, with troughing idlers on the upper and straight bearing idlers on the lower strand. Head and tail centers are 485 ft. apart and the belt is kept taut by passing over an idler pulley to which a counterweight is attached located just under the head pulley. The coal is discharged in a one-car revolving dump underground. Under this dump is a hopper, which holds about 6 tons, or the capacity of three mine cars. Beneath the hopper is placed a reciprocating feeder which feeds the coal from the hopper to the belt. This feeder is perforated and the slack coal goes to the belt first and the lump coal is deposited on top of it. The belt has a capacity of 2,500 tons per day of 8 hr. A 75-hp. motor drives this conveyor as well as the reciprocating feeder. The advantages of this system are reduced cost of all tippie and head-frame structures, a lower operating expense, a smaller investment in hoisting machines—a 75-hp. motor as against an expensive hoist of 500 to 700-hp. capacity. By regulating the feed at the bottom of the slope coal can be fed to the shaker screen in the tippie with such regularity as to make the screening highly effective, and all danger from slope trips is eliminated.

This belt has been in operation about a year and no wear is noticeable. The mine has not been brought to its full capacity, but 1,100 tons have been handled over this conveyor in one day with the belt standing idle about half of the time.

With beds of such diversified thickness and pitch as here prevail, many types of mine cars are in use in the state. In the more recent developments, cars with-

NOTE—Fourth and last installment of article entitled, "Alabama Coal-Mining Practices," presented at the Birmingham meeting of the American Institute of Mining and Metallurgical Engineers.



out end gates, and revolving dumps with which to discharge them, are becoming the general practice. At one operation, on a 25 to 35 deg. pitch, Griffith bottom-dump cars are being used with success. One type of tippie installed at a slope mine, and which well illustrates the use of revolving dumps and gateless mine cars, is shown in Fig. 24. This tippie handles about 2,000 tons per 8-hr. day with a counterbalanced haul of five cars per trip. The capacity of the cars is 3,500 lb., making about 9 tons of coal per hoist.

The coal is pulled from the loaded yard up a 30-deg. slope about 1,100 ft. long by an 800-hp. Vulcan hoist. The drums are 10 ft. in diameter with a 4-ft. 6-in. face. The rope speed is 1,800 ft. per minute. A 500-ton reinforced-concrete bin, located over two standard-gage railroad tracks, receives the coal from the gravity dump. The bin is 39 ft. high on the approach end and 49½ ft. high on the hoist end; this gives an angle of about 8½-

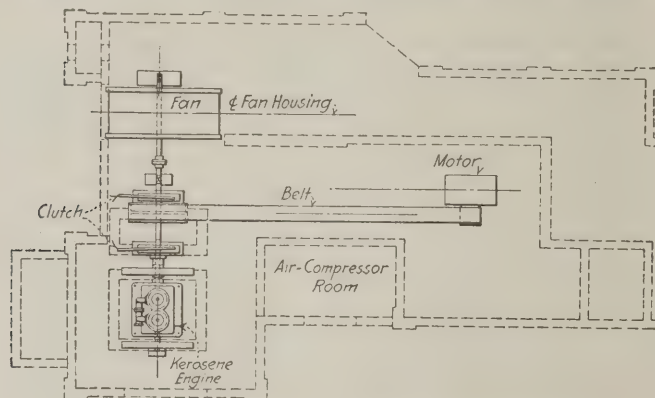


Fig. 23—Auxiliary Drive for a Mine Fan.

When the fan is down the mine is down. This layout shows a fan normally driven by belt from a motor. Should a mishap befall this motor or should the source of power fail a kerosene engine may be started and the fan driven by it. Both engine and belt pulley are clutched to the shaft so that shifting drives is a matter of only a few minutes.

deg. in the gravity dump, and facilitates the prompt return of cars by gravity after they have been discharged.

Hoist operation is controlled by electric signals from the man on the tippie, when cars are ready to be returned to the mine, and from the man in the loaded yard, when the trip is ready to be pulled out. The coal is weighed in the underground yard and pulled into the dump which is released by the operator on the tippie. The dump is rotated by the weight of the coal. As the cars empty, the dump returns to its normal position, and latches automatically. It is then ready for the next trip. As the coal leaves the cars in the dump, part of it is caught by sampling chutes in top of the bin.

Every precaution has been taken to make the tippie as fireproof and safe as possible, the main structure being of reinforced concrete and steel. At the top of the tippie, on the hoist end, a 20,000-gal. water-storage tank is provided for fire emergency.

#### INSTALLATION AND ADVANTAGES OF SAMPLERS

All mines in Alabama employ a dockage system whereby miners are penalized for loading excessive quantities of slate or rock. The method generally used to check up the miner is to pick a few cars at random, unload them carefully, a shovelful at a time, and inspect closely the entire contents of each car. The weak point in this method is that only a few cars can be inspected

during one day's operation and the miner, knowing this, will take the chance of not being discovered.

Erskine Ramsay, first vice-president and chief engineer of the Pratt Consolidated Coal Co., has perfected a mechanical sampler that has made possible the testing and inspection of a large number of mine cars without actually unloading their contents by hand. The Ramsay sampler has been used more extensively by the Woodward Iron Co. than by any other concern in this district. This company installed its first sampler in May, 1920, at Dolomite No. 1 mine. Since then, two additional machines have been installed at this operation, three have been installed at Dolomite No. 3, and four at the Mulga mine; this gives the Woodward company a total of ten samplers.

At Dolomite No. 1, the coal is hoisted in four-car trips and is dumped four cars at a time by means of two Ramsay, rotary, multiple, slope dumps installed in parallel. Messrs. Crockard and Best, of the Woodward company, made such changes in the usual design of these dumps (which are generally power driven) as to make them rotate by gravity. Installed under these rotary dumps are chutes having hoppers at the top. Beneath the right-hand dump there are two of these chutes by means of which the coal is directed to a sampler room, in which one sampler is installed. Beneath the left-hand rotary dump, there are four chutes leading to a sampler room on that side of the tippie, in which are installed two samplers, each being served by two chutes. The chutes have a hopper arrangement at the top for receiving the coal samples and are equipped with rotary gates operated by cables passing over sheaves and extending to a position convenient for the sampler operator. This man is thus enabled to draw the samples one at a time as required for convenient operation (see Fig. 25).

At the sampler, as installed by the Woodward company, the operator releases the sample from the chute onto a double-deck shaking screen 24x42 in. in size. This feeds slowly to a 24x38 in. picking table. The upper of the two shaking screens has 1-in. circular perforations and the bottom screen ½-in. perforations. The lump material that passes over the upper screen is hand picked. That from the lower deck is discharged onto the picking table through a small gate and is likewise picked. The fines passing through the lower screen go directly to the coal car and are not considered in the sampling. The removal of this material, however, facilitates the sampling operation and makes more careful and faster picking possible.

At Dolomite No. 3 mine, practically the same arrangement has been installed. Here the coal is discharged from the mine cars by two Ramsay rotary dumps in trips of five cars each, instead of four cars as at Dolomite No. 1. Chutes of the same design lead from beneath the coal dump to the sampler room in exactly the same manner as has been described and are equipped with gates so that the coal may pass directly to the sampler or, if desired, may be retarded to suit the convenience of the sampler operator.

#### CARRIERS SUBSTITUTED FOR SAMPLER CHUTES

At Mulga mine, four samplers have been installed. These are arranged in two rows back to back, but staggered so as to allow sufficient space for the attendants. This installation presented unusual difficulties because of the small space available for the equipment. The amount of head-room was so small that it was not pos-



sible to install gravity chutes; therefore, a small motor-driven carrier was designed to transfer samples from the receiving gates to any of the four machines. This carrier is a small bottom-dump car with wheels running between the flanges of parallel 10-in. channels. A tripper is set by the operator at any of the four machines and when the switch is thrown, the car runs down, strikes the tripper and automatically dumps, thence returning to the receiving gate. A single loading point is possible at this mine as cars are hoisted singly and discharged by a one-car rotary dump.

This battery of samplers is the latest installation made by the company and several small improvements have been effected in the design. The shape of the skirt plate along the picking table has been altered and both shaker and table have been lengthened. The width of the machine remains 24 in., but the shaker screen

weigh hopper is ready for a new sample. To facilitate weighing, dial scales are used with posts 6 ft. high, thus bringing the dial to the level of the operator's eye. These scales are provided with dials 13 in. in diameter which are graduated to read half pounds.

#### COST IS MODERATE BUT RESULTS ARE BIG

This detailed operation applies to the Dolomite No. 3 mine, where the average sample weighs about 70 lb. and requires approximately 7 minutes to pick. The samples are identified by means of the miner's check number, which is fastened to the bottom of the car and is noted by the tippelman and passed down to the sampling room by means of a speaking tube. The sampler operator keeps a record headed at the top "Coal Sampler Record." At the left, on the next line, is recorded the name of the coal mine and on the right-

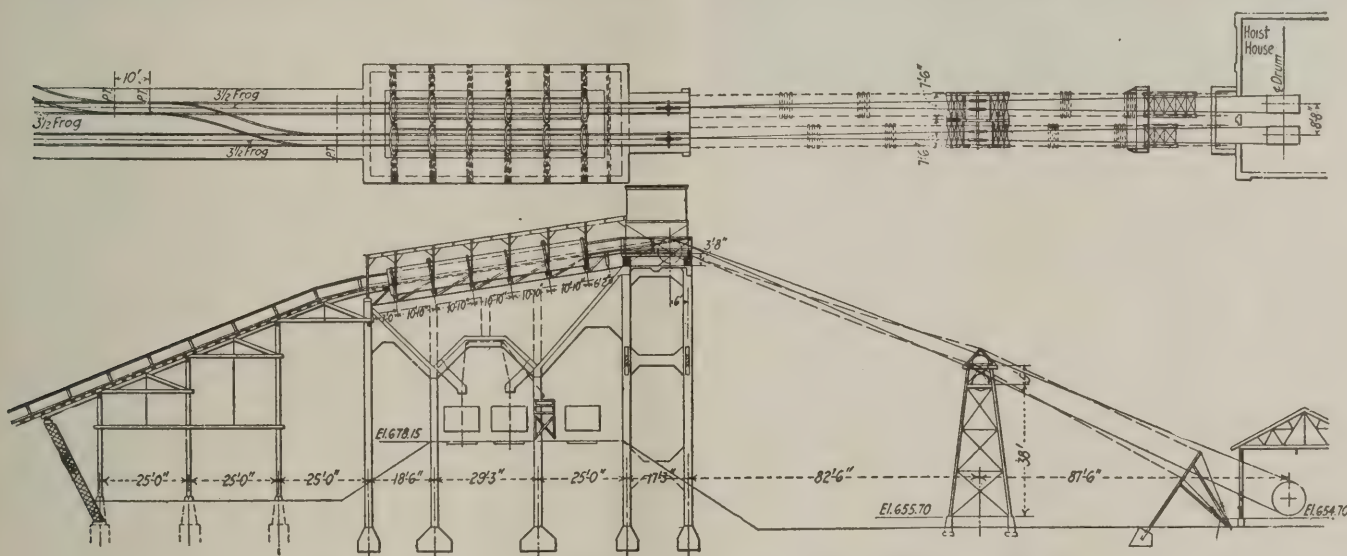


Fig. 24—Tippel at the Dolomite No. 3 Mine of the Woodward Iron Co.

Cars are hauled up the slope in trips of five. In the tippel an entire trip enters and is discharged by a rotary dump set on such a slope that the empty trip will gravitate to the mine. The angle of the dump is  $8\frac{1}{2}$  deg. which assures prompt return movement of the empties.

is 48 in., and the picking table is 54 in. long. The method of actually picking the slate is the same at all installations; that is, the lump is first picked as it passes over the upper deck of the shaking screen to the picking table.

At the lower end of the picking table, there are two compartments; that intended for coal is adjacent to and immediately under the apron of the picking table while that for slate is just beyond the coal compartment. The operator lifts the slate by hand from the table and drops it into the farther compartment; in the mean time the coal gradually passes off the picking table into the near, or coal, compartment. After the slate is picked out, the operator hastens the movement of the coal by brushing it into the coal compartment with his hands.

As soon as the lump coal has been picked, the small gate retaining the material on the lower deck of the shaking screen is opened and it passes onto the picking table and is picked, the coal and slate being deposited in their proper compartments. When the sample has been completely picked, the total weight registered on the scale dial is noted. A gate at the bottom of the coal hopper is then opened, allowing the coal to discharge into the car after which the weight of rock is noted. The rock is then discharged, the gates closed, and the

hand side in the same line is the date. Beneath this, in parallel columns, is the following information: First column, check number; second column, total weight of sample; third column, weight of coal; fourth column, weight of impurities; fifth column, percentage of impurities.

#### INSTALLATION COST DEPENDS ON TIPPLE LAYOUT

The total cost of installing the sampler depends, of course, on the layout of the tippel and whether or not the coal can be dumped directly into a chute from the sampler or must be transported for some distance. The expense also depends on the cost of supports for the sampler and sampling room, and other considerations of like character which are governed by local conditions. An estimate of the actual cost of one coal sampler complete, built by the Woodward company in its Woodward shops, without considering the cost of chutes, sampler room, sampler supports, etc., was about \$300. It requires from 3 to  $5\frac{1}{2}$  hp. to operate a sampler.

The scale is supported independently from the sampler, as otherwise the vibration would make close reading impossible. The Woodward company has found that the speed of the eccentric shaft operating the shaker screen should be about 150 r.p.m., also that the throw of the eccentric should be about three inches.



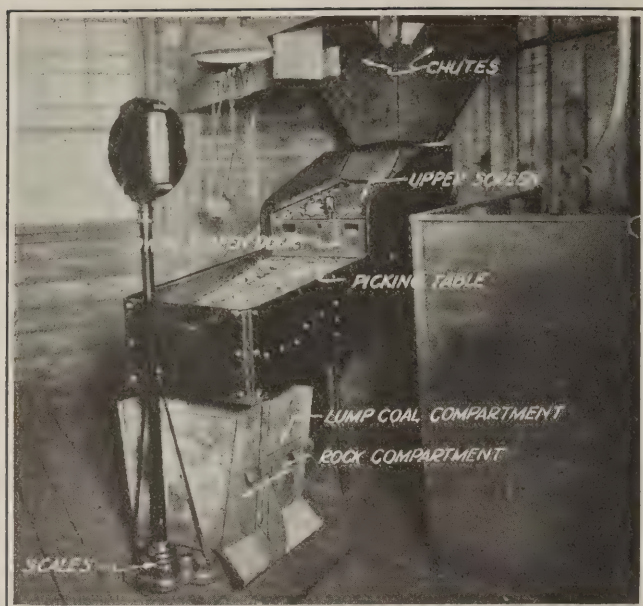


Fig. 25—Ramsay Sampler at Dolomite No. 1

This machine permits quick accurate sampling of the coal contained in a mine car. It has been the means of greatly decreasing the amount of rock and refuse loaded, hoisted and passed through the preparation plants. It tends to keep rock in the gob where it belongs.

Figures furnished by the Woodward company show that the percentage of slate and other impurities in the coal prior to the installation of the first Ramsay sampler, as determined by washer loss, was approximately 20 per cent of the total quantity of material hoisted. Since the samplers have been in operation the percentage of impurities, as determined by the washer losses, has been about 10 per cent. The company believes there is no question but that the reduction, amounting to approximately one half, in the quantity of impurities has been due entirely to the sampler. It is not necessary to give actual figures as to dollars and cents saved. The total amount will be proportional to the total quantity of material hoisted; the company has the 10 per cent direct saving in addition to another highly important economy secured by eliminating the hauling, hoisting, and handling of impurities to the washers. Only one-half as much refuse now comes from the washers and is thrown away as was formerly the case. Not only is the cost of hoisting this material entirely eliminated, but also the wear and tear on the machinery and all of the other incidental items involved in the useless and unnecessary operation of loading rock and impurities when the fundamental aim should be the mining of clean coal.

#### PROGRESS MADE IN MINING COAL SAFELY

Considerable progress is being made toward mining coal safely in Alabama. Progress made in this direction is best visualized by comparing records for a 10-year period, say 1913 to 1923. In 1913, 73.7 per cent of all coal mined in the state was produced by pick and shovel methods and only 26.3 per cent by undercutting with mining machines. During this same year, 68 per cent of the coal was produced with permissible explosives and 32 per cent with black blasting powder. In the year 1923, 53.8 per cent of the state's output was mined by pick and shovel methods, whereas 46.2 per cent of the production was derived from undercutting with mining machines. During the latter year, 78 per cent of the explosives used in coal mines were of the

permissible type and only 22 per cent was black blasting powder.

In brief, for the 10-year period, there has been approximately a 20 per cent decrease in pick and shovel mining and a corresponding 20 per cent increase in mining coal with machines. Permissible explosives show an increase of 10 per cent for this period, while black powder showed a decrease of 10 per cent.

Marked improvement has been made in the matter of laying coal dust in the mines of the state. The principal method now used is by the installation of pipe-line watering systems. In most of the large producing mines, efficient watering systems have been installed; while in some of the smaller operations, watering is done in a desultory way by the use of water cars. However, a considerable number of small operations do not use any means of laying coal dust in order to prevent its being raised into clouds with possible ignition and explosion propagation.

#### MINE SURFACES WASHED DOWN WITH GARDEN HOSE

In large producing mines, sprinklers are employed to wash down the coal dust on ribs, roof, and along roadways, using 50 to 100 ft. lengths of hose of the garden type. These methods have been supplemented, in a large number of operations by spraying water onto the cutterbars of mining machines to wet the coal dust during the process of undercutting. It can be safely stated that fully 90 per cent of the dust formed in Alabama mines comes from the face, and it has only been in the last two years that attention has been concentrated upon laying such dust at its source.

Where coal is undercut with mining machines, without the use of water at the cutter head, large clouds of dust are raised in the air. Furthermore, while the machine cuttings (bug dust) are being hauled, considerable leakage occurs through the cracks in the car bodies thereby increasing the quantity of dust along roadways. Since the introduction of water at the cutter chains, practically no dust is raised during the process of undercutting and the spillage and leakage of coal along roadways has been reduced to a minimum. In fact so great has been this reduction that there has been a considerable decrease in the number of road cleaners employed as compared to the number necessary before the introduction of water at the cutterbar.

The sprinkler systems installed in some of the mines of Alabama are among the best and most thorough in the United States. Pipe lines from tanks are laid from the surface or are connected with the discharge of pumps. Water is then carried to the face of all working places, where sprinkling is performed by men employed especially for this purpose. Fig. 26 shows the method of sprinkling in one of the mines and illustrates the care with which the coal faces are washed down.

From experiments performed at the mines, it was found that twenty-one times as much dust is raised at the face while coal is being undercut with machines as is raised by trips traveling at various speeds along the haulageway. It was ascertained further that five times as much dust is raised at the face while miners are loading coal as is raised by moving trips.

At shaft bottoms, under former methods, great clouds of dust were raised during dumping operations. Since dust has been attacked at the face, however, practically no visible quantity of it is thrown into the air during car discharge operations underground. The most strik-



ing change, however, has taken place in tipples on the surface. Under former conditions, tipples were enveloped during the greater part of the shift in large clouds of coal dust, but at present, the atmosphere surrounding them is clear.

#### SPRINKLING SYSTEMS HAVE AVERTED EXPLOSIONS

The cost of maintaining efficient sprinkling systems in Alabama is quite variable, depending on the output. It ranges from a few cents to 6c. per ton. Such a system, of course, is quite expensive to maintain, but it can be safely stated that, in the past few years, explosions originating in the interior of certain mines have been prevented from propagating throughout the workings by the efficient system of sprinkling employed.

Considerable interest is being manifested in this district at present in the use of rock dust as an explosion preventive. Insurance carriers, as well as the Federal government, have been active in the promotion of rock dusting in this state. It is only a matter of a short time until even the most efficient methods of explosion prevention by the use of water will be supplanted by the use of rock dust.

In addition to the strides that have been made by reason of the introduction of permissible explosives supplanting black blasting powder, the substitution of mining machines for solid shooting methods, and the use of water for laying coal dust, together with the interest manifested in the use of rock dust, some of the mines have, within the past few years, introduced permissible electric cap lamps. The progress in this direction has been rather slow, but it is only a matter of a short time until a more extensive use of closed lights will be adopted, especially in the gaseous mines.

Since the Bureau of Mines established a rescue station in the Birmingham district, several thousand miners have been trained in first-aid and rescue work throughout the state. It is now quite rare to find a mine that does not employ a large number of men trained in first-aid and safety methods and in the use and care of breathing apparatus. These courses of instruction have done much to educate the miner in safety practices. Some of the larger operations in the district have been carrying on the training of their employees in first-aid and rescue work from their own central rescue stations. The Mining Department of the University of Alabama has provided a course in mining

for mine foremen and the more ambitious men about the coal operations are availing themselves of this opportunity. This course covers from four to six weeks, and the charge, including board, is nominal.

In some mines throughout the state, mainly as a safety measure, section foremen are employed. These operations are divided into sections of several entries each. Each section has a foreman, who superintends the timbering, the handling of explosives, and other safety measures, as well as the production of coal. Where this system has been adopted, accidents have been greatly reduced.

In the employment of labor, some mines follow what is known as a contract system. By this arrangement the contractor is paid a margin above the digging price, and acts in the capacity of a section foreman.

In Alabama, as in other states, the more progressive and humane operators add to their cost per ton by utilizing precautionary measures, while the less progressive operators sometimes disregard ordinary safety standards. As a result, during periods of fierce competition the progressive operators are at a disadvantage. While the principle of "less government in business" is, as a rule, sound, at the same time it must be conceded that a certain degree of government supervision is necessary when human life is at stake. The only means by which safety standards, applicable to all producers of coal, can be fixed, is through the action of the Federal government.

#### EXCELLENT MORALE PERVADES MINE LABOR

Alabama has made its own mine labor, which consists chiefly of native whites and negroes in the approximate proportion of half and half. There are some operations where 75 per cent or more of the employees are negroes. The state has been non-union since 1908. There have been two invasions by the United Mine Workers of America—in 1917, and a final effort in 1920 and 1921. The union failed in its efforts to organize the state because of the loyalty of the miners. It has been found that the best class of both whites and negroes have no desire to unite in the same organization; this feeling is deep rooted and sincere.

The operators of mines in Alabama are not unmindful of the fact that under non-union operation there is added responsibility on their part that cannot be shirked. In the last 10 years, conscience has been awakened to a sense of the duty that all men bear each to the other but more particularly the relation of the employer toward the employee. In addition, the white man is beginning to appreciate the value of the negro and to realize that after all each race has a common purpose and, in their respective spheres, should work for the good of all. In the main, the old argument, so often advanced by union organizers, namely, "absentee ownership" does not apply to Alabama, where many mine owners either live at their mines or visit them at regular and frequent intervals. Close acquaintanceship, which means common sympathies and mutual aims, is, after all, the basis for the best and most lasting relationship of man to man.

In the preparation of this paper, I am indebted to J. J. Forbes, District Mining Engineer, Bureau of Mines, Birmingham; C. H. Nesbitt, Chief Mining Inspector, also of Birmingham; J. L. Davidson, Secretary of the Alabama Mining Institute, and to the operating officials of many of the coal mining companies of the state for their assistance.

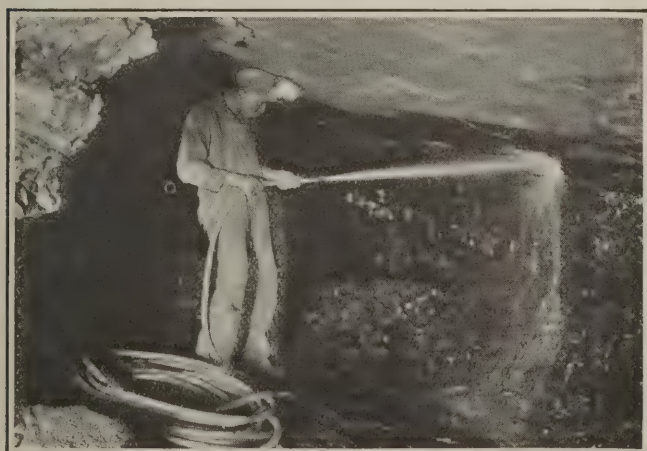


Fig. 26—Washing Down Ribs, Floor and Roof

In order to keep down the coal dust in Alabama mines not only is the cutterbar of the mining machine sprayed but the mine surfaces are washed with a hose as here shown. Dust is a dangerous enemy to mine safety.



# Mine Engineers Inspect Big Progress in Southland

American Institute Men Touring Appalachians See O'Toole's 50-Ft. Cutter and Loader, Jones' Big Loading Machine and Other Coal Mine Developments — Trip Through Many Fields Ends in Alabama Meeting

BY R. DAWSON HALL  
Engineering Editor, *Coal Age*

IN A SPECIAL train of six cars, four of which were sleepers, the American Institute of Mining and Metallurgical Engineers made a visit to the mines of the southern Appalachian region, starting from Washington, D. C., Oct. 7, holding sessions here and there and winding up in Alabama ten days later. They skipped the rich coal fields of Kentucky and Tennessee but visited those of the Pocahontas region, the zinc and copper mines of eastern Tennessee and the iron and coal mines of Alabama. By annual tours such as these, the members qualify themselves to take a broader view of the problems of their profession.

In the early days of the tour, while they were guests of the Southern Appalachian Coal Operators' Association, they had an opportunity to see the coal dry-cleaning plant at McComas, W. Va., the Jim Elwood Jones "Coloder," a big capacity machine combining scraper and conveyor, and Gen. Edward O'Toole's immense cutting and loading machine operating a 50-ft. cutterbar and drag scraper. They saw other interesting coal mining developments en route, and the coal men in the party learned a good deal in copper and iron mines which might be of profit to the coal industry. The trip, of course, included dinners and sight-seeing stops, as this annual tour always does, closing with a visit to Muscle Shoals.

## A BLOW AT OUR TAXERS

Col. Arthur S. Dwight, in his speech at the Washington dinner of the institute Oct. 7, declared that the city of New York might have the wealth of the country in its charge but that Washington has discovered a way for relieving it of that wealth to such a degree that it seemed as if Washington one day might become the rich and New York the poor city of the commonwealth.

Herbert Hoover, Secretary of Commerce, said that though large taxation was necessarily imposed, he supposed no engineer would take exception to \$65,000,000 annually which was expended in original research work, a sum equal to only  $2\frac{1}{2}$  per cent of the entire expenditure of the government. Part of this expense was due to the necessary regulative action of government. It is, he said, the only part of the government's expenditures that is reproductive. It returns its cost a thousand fold in reduced taxation.

Mr. Hoover declared that we could profitably double our expenditures for research. Unfortunately, we give our scientific staffs inadequate compensation. The highest salary paid is \$7,500 a year and that is given to scientists whose work is more largely administrative than scientific. The salary paid is rarely over \$5,000 a year and the average is but \$2,900.

Recently the government (U. S. Bureau of Standards) was prosecuting an inquiry into the ignition of gasoline in co-operation with an automobile association. An explosion occurred killing several of the experi-

menters. Twenty-two persons were deprived of their means of support by that accident but under the regulations the government could pay them an aggregate of only \$930 a year and had to look to outside organizations to supplement this meager compensation fund.

Mr. Hoover declared that all this was wrong, that men should not be asked to make such sacrifices on behalf of the government. They were entitled to pay commensurate with their talents.

## PUBLIC LIFE NEEDS MORE ENGINEERS

A tribute was then paid to the engineer by Mr. Hoover. "The engineer," said he, "is a servant of the truth. He is not swayed by his emotions but solely by facts, by truth. His interest is in physical forces and quantities. He believes in what he can prove and not in what he merely would like to prove. His is the guardianship of the fact. We should have more such men in public life. The engineer need not enter the national employ to help in rendering such service. He can, in his capacity as citizen, use his talent for reasoning on facts and thus aid in directing the policies of the nation."

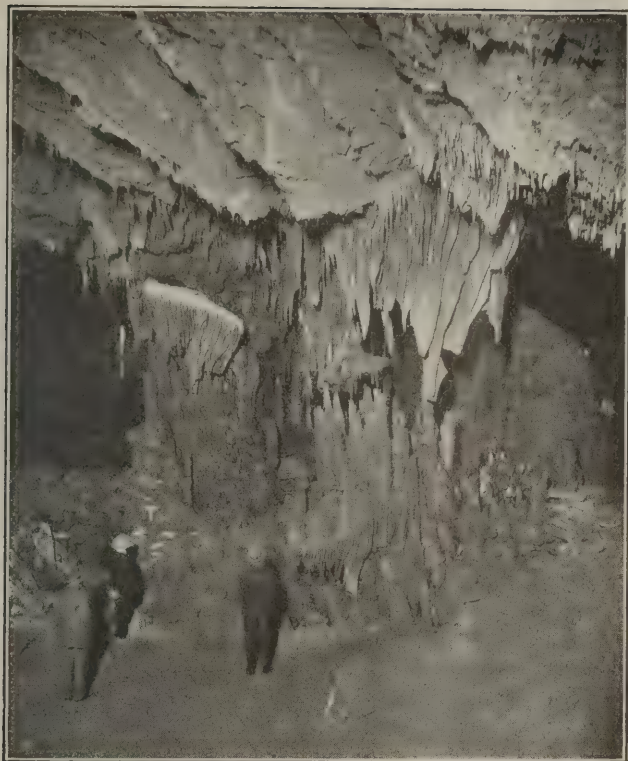
The effect of emotion on politics was greatly deplored by Mr. Hoover. Recently, said he, he desired his secretary to find the facts on which the government ownership advocates based their arguments. The only tangible fact on which they relied was that at the Niagara Falls bridge the lights on the Canadian side with government ownership cost one-third as much as those on the United States' side with private plants. On this one fact was based the argument for an investment of 40 billions of dollars and the employment by the federal government of three million men. The question of ownership, whether public or private should not rest on opinion but on well-weighed facts.

## MINING KEEPS RAILROADS BUSY

Mr. Dwight remarked that 54 per cent of the tonnage on American railroads consisted of mineral products and 30 per cent of the revenue derived from transportation came from the carriage of these products. The importance of the industry, even during the present depression, made its unfavorable condition a matter of national concern, especially as it had resulted in the idleness of many capable mining engineers for the activities of whom the institute was trying to discover a new outlet. Among the other speakers were George S. Rice and President William Kelly.

That evening the visitors, about 72 in number, left for Luray cavern near Roanoke, Va. The cavern is a grotto or series of irregular passages, the result of solution and erosion in Silurian limestones and clays. The cavern has deepened with time. From the roof hang stalactites which look singularly menacing to a coal-mine man. Fortunately when struck they give out a pure and not a drummy note, so to all appearance





**"The Chapel" in the Grottoes of the Shenandoah**

In this grotto not only stalactites and stalagmites excite the wonder of the beholder, but natural rock much like the flies in a theater hang down over the fairy scene giving a most unusual effect. On the left can be seen a shield like a canopy and draped below with stalactites, standing almost without visible means of support. It is not as much inclined as many others.

they are not likely to fall, at least for some years.

In the Grottoes of the Shenandoah, visited by the party in the afternoon, the measures are vertical or nearly so in contrast to those at Luray which are almost horizontal. The appearance was therefore like the scenery in a theater stage as seen from under instead of behind the scenes. There, strange "shields" (probably of siliceous matter) had to all appearance partly fallen from the roof and become supported at varying angles on the bottom. They had then become cemented to the roof by the deposition of mineralized waters. In time the bottom of the cavern on which they fell was dissolved away and the shield can now be seen supported by the roof at one tip at what seems an impossible angle.

#### NO FIREBOSS WOULD PERMIT THIS

The rock thus suspended may weigh several tons. Ajax shield is 50 ft. above the floor; others are lower. The fire boss would certainly mark "Danger" against the area where the shield appears, yet mysteriously it is most firmly supported at its upper tip at an angle of 45 deg. to the vertical.

As the caverns are near the surface, nowhere much more than 200 ft. below the grass roots and as there is no oxidation to keep them warm the temperature is about 54 deg. the year round. The owner at Luray has taken due advantage of this fact and is ventilating his house with the pure temperate air of the cavern. He has adopted this means of keeping an even temperature in his house the year round. Before many years we also may be striving to get a similar result by artificial refrigeration and the use of fans though at a somewhat greater expense than that which the owner of the Luray cavern is incurring.

The morning of Thursday found the party at Bluefield ready for an early start. Most of the technical men visited the mine of the American Coal Co. of Alleghany County, at McComas, W. Va., to see the dry-cleaning plant. The coal at the mine comes out in lumps as large as any in the Pocahontas region, but the loading of the coal produces an immense quantity of dust even though care is taken to make the drop a minimum. The dust is so thick that the mine inspector has forbidden smoking on the tippie.

#### LESS DUST IN DRY CLEANING NOW

In the rescreening plant, which has been described at length in a previous issue of this journal, the dust is distinctly less in evidence. Unfortunately a little dust escapes and lodges on the floors and structural steel rafters. It is of course the finest of the dust. Should it become dislodged it might be sufficient to cause a small flare-up and explosion which might in turn dislodge more dust. On the whole, however, the impression gained is that the dry-cleaning plant is freer of hazards than the ordinary tippie, and the use of electric lamps tends to reduce the risk to a minimum.

Some of the finer dust, which would make excellent foundry facings, is escaping from the collectors and passing into the air almost like smoke. By use of the Cottrell system it might be saved, but the cost would be large, and the sale of foundry-facing material seems so limited as not to encourage a heavy investment in its collection.

Leaving the plant a visit was made to the Pocahontas Fuel Co.'s Delta mine at Switchback, which the members entered by a convenient opening at Maybeury. Here they saw the J. Elwood Jones machine, the "Coloder," at work in a short room 18 ft. wide. The machine is 6 ft. wide in front. The coal is crowded onto a drag scraper and is transferred to a conveyor and back to the car. With three placements of the machine the whole face is cleaned up.

Conditions are favorable in Delta mine. The coal is about 7 or 8 ft. thick; it is clean, and has a splendid roof and good floor. Cars have to be spotted one at a time behind the machine and for this reason its output is reduced.

Lunch was served at the Club House at Gary, W. Va., with Gen. Edward O'Toole as host. The party had



**Entrance to Baby Mine, Pocahontas Fuel Co.**

The visitors had a good chance to see the intensive development and the excellent roads between Bluefield and Gary. This is one of the many mines clustered in McDowell, Mercer, Wyoming and Tazewell counties and located in the justly celebrated Pocahontas coal field. It is located in the village of Pocahontas, Va.



swelled to several hundred. The visitors traveled about two miles to the No. 6 mine at Ream to see the O'Toole machine which is now working on a room pillar. The room is perhaps 25 ft. wide, and the rib being drawn is a little under 50 ft. in width. A cutterbar 50 ft. long undercuts the face of the pillar, which, being under considerable weight, tends to fall as fast as it is undercut.

Men with picks, however, are stationed along the face to bring the coal down should it fail to fall. It drops onto a drag scraper which carries it to the room roadway elevating it above the cars which stand in a trip at the loading point. A change has been made in the jacks used in moving the machine forward. One-hundred ton hydraulic jacks hold up the roof at the working face. It is probable that these will be replaced later by jacks of 150-ton capacity. The screw jacks which move the cutter and the conveyor forward each press against the base of a hydraulic jack and are operated by the driving mechanism of the cutting and loading machine.

#### HOW O'TOOLE'S MACHINE ADVANCES

The movement forward is automatic. However, the mechanism is so arranged that any screw jack can at pleasure be thrown out of operation. This is done whenever the hydraulic jack is to be moved up. The jack screws are 8 ft. long and advance the cutter and conveyor a distance of 6 ft. By moving forward one hydraulic jack at a time the cutterbar and conveyor need not at any time be stopped. The forward movement is continuous. There are always jacks enough in operation to move the machine ahead.

The bits drag the cuttings toward the edge of the pillar adjacent to the room track and here this fine coal is shoveled by hand onto the drag scraper. In order to support the roadway so that a trip can be stationed with its hindmost car well back in the goaf, heavy posts 18 in. to 2 ft. in diameter are placed along the track. The hydraulic jacks are provided with blocking on top, which can be rapidly and easily removed as soon as the water pressure on any one jack is relieved.

Some of the visitors went to the pulverized-coal plant at Gary. The Gary power station is using for fuel the waste from the picking tables, the railroad and mine-road cleanings. The material used runs from 25 to 50 per cent ash. The coal is pulverized in two Fuller-Lehigh mills so that 90 per cent goes through a 200-mesh screen. Practically all the power needed is



Tipple and Sizing Plant, Pocahontas Fuel Co.

For a low-volatile coal region, Pocahontas has coal that with proper treatment gives unusual opportunity for sizing. It makes a bad dust and when dumped into barges at the coast gets badly broken, but with care it will make a fair proportion of lumpy fuel well suited to open grates or the usual house furnace.

generated in two 800-hp. boilers which are run at 200 to 250 per cent of rating.

The coal is fed at the top of the combustion chamber with just enough air to carry it to the burners at the required velocity. There it burns, supplied with air introduced through openings in the combustion chamber. The fine ash falls to the bottom and remains a dust so long as it is not permitted to pile up high enough to reach the zone of intense heat.

#### NEW USE FOR BOILER-ROOM ASH

Vitus Klier, the chemist, is experimenting on the use of the "sand" which is the result of this intense combustion for the making of road and sidewalk surfacing material. When the ash is at such a temperature that it will not fuse and yet will effectually melt road tar, it will be mixed with that material, the whole being spread and rolled to an even surface.

The committee of the Pocahontas Coal Operators' Association which was entertaining the engineers, distributed an interesting little book containing the itinerary, a description of the region and a folding map, also an insert relative to the electrification of the Norfolk & Western R.R.

Friday morning, Oct. 10, the Institute train arrived at Mascot, Tenn., and one of the American Zinc Co.'s mines was visited. At this operation some of the openings were about 120 ft. deep, approximately 200 ft. long and over 100 ft. wide. The size of these mammoth stopes demonstrates quite clearly the strength of the roof in this mine. The roof cannot be tested as in coal mines but accidents in connection with it are rare. Unfortunately coal mines are not provided with a dolomite roof. If they were, accidents from falls would be far less frequent.

#### A TIP FOR COAL-COMPANY FARMERS

The company has an experimental farm which is kept in good condition by the use of the pulverized dolomite from its zinc mill. The corporation lays great stress on this agricultural effort setting thereby a good example to some coal companies which let their farms run down till their product will no longer pay the taxes. The American Zinc Co.'s farm is a good advertisement for its dolomitic product. Though the coal operator has no byproduct of this kind to sell there is no reason why he should prove himself the least thrifty farmer in the vicinity in which he operates. A large concrete culvert at Mascot prevents creek water from entering the mine and flooding the workings.

In the afternoon visits were made to the quarries of the Appalachian Marble Co., and the Gray Knox Marble Co., also the mill of the Knoxville Marble Co. Here the marble was squared, polished and in some cases reduced to slabs. In the evening the visitors were entertained at the Whittle Springs Hotel, about five miles from Knoxville, both a dinner and a dance being provided. Philip N. Moore's thoughtful speech on that occasion portrayed the new view of the engineer as to what are the essential elements in preparing for the practice of his profession. He believed that the engineer should have a broad education that would teach him not only the technical facts of his vocation but something of the arts by which the mental horizon of man was broadened. He questioned whether specialized technical ability could be acquired at college.

"When," said he, "we arrive at the ideal, an engineer





At the Mines of the American Zinc Co.

Photography only with great difficulty could be employed to convey the profundities of the artificial caverns at Mascot, Tenn. The roadways, often in the hanging wall or the footwall which are barren rock, are apt to be much like those in coal mining as is the one shown here, but in the stopes from which the ore has been drawn, the flood-lights provided for the occasion, only inadequately conveyed to the visitors the tremendous outlines of the enveloping pillars and roofs, and merely gave a rough sense of the immensity of their gigantic proportions.

will not be hired as a porter to do a special job at the behest of someone less able to do it but he will himself be manager and director, with the forces of the company that engages him wholly under his command. Today the lawyer and the banker direct, and the engineer fetches and carries for them."

In the early morning of Oct. 11 the train left for Ducktown, Tenn., arriving in time for lunch. In the afternoon the party went down the McPherson shaft and returned by way of the Burra Burra shaft, of the Tennessee Copper Co. At this mine and in other metal mines the compressed air pipes are kept above the floor, resting either on old drill shanks or on iron rods that are bent around them so as to embrace the pipe. All the chutes are closed by radial steel gates which cut off the movement of the ore by an upward motion. This is more certain than one that is downward, because in this instance the gate movement cannot be stopped by the flow of ore. The gate is moved by two racks and pinions, the pinions being near either end of a shaft rotated by a hand crank.

#### THIS CLOCK MIGHT SERVE A COAL MINE

At each shaft is a "clock" showing the number of lost-time accidents that have occurred during the current month, there being twelve points on the dial. The legend runs: "When a man is injured the hand moves. Can we go a month without moving the hands? This clock shows the number of lost-time accidents at this mine during the month. Below is a statement of the lost-time accidents for every month during the current year."

These three practices might be imitated with advantage by coal-mine companies. The metal mines, piped for compressed air, are not particularly wet, but the water may be unusually severe on pipe owing to its corrosive action. Coal-mine chutes are usually so planned that the gates close downward, not upward. In consequence they have to crush the coal if they are to be closed. In some cases they may choke and fail to stop the flow of coal. The upward-moving gate on the other hand, if it strikes a big chunk merely lifts it up by its end and proceeds to shut off the flow of ore in a positive manner and not merely by a choking of

the current. The clock method of dealing with lost-time accidents might be adapted to any mine.

Later in the day inspections were made by the engineers of the smelter and acid plant. In years gone by after the fumes from ore roasting had destroyed the grass over several square miles of territory and the floods had carved the unprotected ground into a badly gullied area and swept away the soil that had been accumulating for centuries, the company was compelled by North Carolina and Georgia to put in an acid plant. As a result 1,200 tons of 60- and 66-deg. sulphuric acid are now made per day.

#### IS THERE MONEY IN MINE WATER?

The production of copper is unprofitable at present prices, but the sale of the acid brings in an appreciable return. It would be at least worth while for coal companies to make further experiments to ascertain whether it would be possible to treat the waters from their mines so as to produce a not unprofitable by-product therefrom and so protect the creeks into which water from the mines is being discharged.

In the evening of Saturday, Oct. 11, the train went on to Chickamauga, and Sunday was pleasantly spent viewing the various battlefields in the vicinity.

At noon, the institute members were entertained at the Whittle Springs Hotel, on Signal Mountain, Col. William S. Shields, president of the Knoxville City National Bank being toastmaster. Addresses were made by Frank Bane, director of the Knoxville department of public welfare; William Kelly, president of the institute; Dr. Harcourt A. Morgan, president of the University of Tennessee; P. N. Moore, construction engineer and geologist, of St. Louis, and Wilbur Nelson, state geologist. The secretary of Knoxville Automobile Club delighted the audience by some well-rendered songs and a characterization of a negro pastor.

In the evening the special train moved on to Birmingham, where a technical session was held on Monday morning, conducted by George Gordon Crawford, president, Tennessee Coal, Iron & R.R. Co., chairman of the committee of arrangements. After an acknowledgment by Mr. Kelly of the welcome tendered by Mr. Crawford, H. S. Geismer briefed his paper on "Coal-Washing Practice in Alabama." In the discussion that followed Mr. Geismer said that three operators producing coal for the market had introduced coal-washing tables but that none of the companies producing iron were using tables for the cleaning of their fine coal. Frank H. Crockard, president, Woodward Iron Co., elicited the fact that at one point six mines were operating and seven washers, yet, in the reservoir below, gold fish had established themselves and had thrived so well that they had become an actual nuisance. Erskine Ramsay, chief engineer, Pratt Consolidated Coal Co., said that the water used in washing was saved, even that draining off the cars below the tipples being put back through the washer. Mr. Fies said that the mine water was probably acid, but that he had been surprised to find that the sludge water in the washery was alkaline.

F. W. Miller, manager, byproduct division, Sloss-Sheffield Steel & Iron Co., made brief remarks regarding his paper on "Byproduct Coking in Alabama." Theodore Swann, president, Federal Phosphorus Co., spoke on the value of phosphoric acid in the fixation of ammonia, declaring that it combined as satisfactorily with ammonia as sulphuric acid and made a more valuable fertilizer. It created more heat in the reaction but



not enough to occasion any difficulty. A product containing 60.5 per cent of phosphoric acid and 14.5 per cent of ammonia was obtained.

Milton H. Fies, vice-president, De Bardeleben Coal Corporation, then gave a brief outline of his paper on "Alabama Coal-Mining Practices," laying emphasis on the precautions being put in force in Alabama and regretting that, owing to local conditions, the record was not as good as in some other states. He said he had been much criticized for his advocacy in his paper of Federal legislation for the protection of mine workers. L. E. Bryant, of Tennessee, remarked that one mine was spending 15c. per ton of coal solely with the



**Mascot Mine of American Zinc Co. near Knoxville**

Part of the tailings from the jigs are used for commercial purposes, such as road and railroad ballast. Some of the jig tailings and all the flotation tailings are crushed and used for fertilizing purposes and as paint filler.

idea of promoting safety and added later that one of the Belgian experts who had been invited over by this government had remarked to him that safety provisions in Europe had doubled the labor cost of producing coal, bankrupted many of the companies in Germany, France and Belgium and caused the formation of syndicates for the purpose of sustaining prices at a level which would make such elaborate safety provisions feasible.

In this connection R. D. Hall remarked that in many cases the laws in one state were so much more severe than in another with which it had to compete that a desire arose for a greater uniformity of safety practice such as a Federal law would maintain. However, there were not many who wished the Government to undertake this regulation, which under the Constitution as now written would be without warrant. R. V. Norris said that the present state laws were not inadequate and were well suited to state conditions. He believed that safe production was cheap production and that a Federal law covering mines in all states was not desired nor desirable.

George S. Rice said that joint action between the states without Federal action was preferable. Uniformity of the laws was an end to be sought and it was to be hoped that it might be attained under Federal initiative. He said the recent laws passed in Great Britain had improved her accident rate and that better laws in the United States might have a similar effect.

The Federal government regulated, through the U. S. Bureau of Mines, the operation of mines leased from the nation. From these mines about 2,000,000 tons were produced annually. It must be remembered, however, that the accident rate was normally high in such mines because it chanced that the beds thus operated pitched heavily, increasing the natural hazard. In reference to Mr. Feis' statement that "It is only the matter of a short time until even our most efficient methods of water prevention will be supplanted by the use of rock dust as an explosion preventive," Mr. Rice said that in Great Britain rockdusting is required everywhere in bituminous coal mines whether naturally

wet or dry. Central France has not yet arrived at rockdusting, Germany is coming to it rapidly both in the Ruhr district and in Silesia, after a long period of firm faith in the value of water. Other mining regions of Europe are warm advocates of the value of rockdusting.

W. K. Kavanaugh, president, Southern Coal, Coke & Mining Co., of St. Louis, said that he believed that the state laws were in the main satisfactory and did not establish any unfair production-cost differentials between states.

The afternoon session concerned itself solely with metallurgical problems and the evening with geology and the working of iron ore. W. R. Crane, superintendent, Southern Experiment Station, U. S. Bureau of Mines, Birmingham-Tuscaloosa, Ala., showed wonderful slides exhibiting the methods of working the red iron ore and the effect of crush on mine pillars.

In between the afternoon and evening sessions a visit was made to the Shannon red iron ore mine of the Gulf States Steel Co., where a slope inclined at 52 deg. goes down 2,400 ft. to the iron-ore bed 1,900 ft. below the surface. There is little difference between a coal mine and any one of the many red iron ore mines of the Birmingham district, this Shannon mine, it is said, simulating a coal mine by having in its atmosphere a small quantity of methane.

The rooms are driven as in coal mining, leaving about 51 per cent in pillars. The work is unusual for this district in that the advance is in the lower 8-ft. bench, which is usually too siliceous for the profitable manufacture of iron. When a room has gone its due length the upper 12 ft. of ore is removed and the roof allowed to fall in on the retreat. The iron ore in the pillars is left. The roof is of shale and needs careful watching, and the bottom at times will heave, if overloaded. The inclined shaft, or slope, was driven by another company and without timbering. It fell in when about 20 ft. from the ore and had to be heavily concreted for its entire length.

Day coaches were provided for the itinerary that occupied to overflowing the second and third days' stay in the Birmingham district. On Tuesday visits were made to Ishkooda No. 13 ore mine, of the Tennessee Coal, Iron & R.R. Co., the No. 1 ore mine of the Woodward Iron Co. and the Muscoda No. 6 ore mine of the Tennessee Coal, Iron & R.R. Co. The party then went to Bayview and was entertained at a barbecue. At this place is a coal mine, an impounding reservoir and a village of the Tennessee company.

The coal mines of the Birmingham region have in general a character all their own, due partly, doubtless, to the influence of the adjacent and associated ore mines of the district and partly also in the case of the mines owned by the steel companies to the fact that the breakage of the coal is a matter of no importance though skips probably need not be a cause of coal breakage if properly handled. At Bayview the coal is raised in a huge skip on a slope driven through sandstone at an inclination of 26½ deg. The bed worked is the Pratt seam. The mine produces 2,400 tons a day. To those accustomed to the rapid movement at a shaft with cages the leisurely efficiency of the big skip is a marvel to behold. The coal is washed in three-compartment jigs. As this washery was described by H. S. Geismer in the issue of Oct. 9 it is not necessary to say more about it here.

The train then moved on to Edgewater, another mine



of the Tennessee company with a most unusual hoist having two drums in balance. One hoists from an upper landing at a depth of 238 ft. and another from a landing at 380 ft., 142 ft. below. They both hoist from the Pratt seam which is faulted at that point, the throw being about 140 ft. The drums are made of unequal diameters so that the hoist will raise a load from the lower landing in the same length of time as it will lower another load to the upper landing and vice versa. The clean coal in the bed is 56 in. thick.

The output has been 6,002 tons in a single day, but the mine produces regularly about 4,000 tons daily. The shaft which is 420 ft. deep serves an area of 4,000 acres which contains 30,000,000 tons of clean coal. About 1,200 men are employed. The main hoisting shaft is lined with concrete. The air shaft is 12 ft. in diameter, and the manway is 800 ft. long and measures 7x12 ft. The visitors inspected the coal washer, the hoisting and boiler houses, the machine shop, supply house, bathhouse and store.

The trip concluded with a trip to the Fairfield coke works of the Tennessee company and the Fairfield wire mill of the American Steel and Wire Co. and the members noted with interest the manufacture of wire fence, wire nails and barbed-wire.

In the evening the Industrial Relations Committee of the American Institute of Mining and Metallurgical Engineers held an open meeting in the Hotel Tutwiler addressed by Frank H. Crockard, president, Woodward Iron Co., the subject of Mr. Crockard's remarks being the industrial relations in the coal-mining industry of the Birmingham district. Mr. Crockard pointed out that the companies of the region felt to the full their obligation to pay fair wages, to see that checkweighmen were provided and to arrange for the settlement of grievances.

They did not believe that wages altogether out of line with those in the district for other kinds of labor should be paid by the coal-mining industry. They were insistent on the appointment of checkweighmen and in fact brought pressure to bear on their workmen to provide them. After providing for the settlement of grievances they were not pleased to find that none were presented, and they told their foreman and subbosses that they would hold them responsible for the failure of their men to present grievances which the companies felt sure existed.

After this expression of their displeasure and earnest intention to hear and redress grievances the complaints began to come in, and now the provisions for adjustment were being duly received and carefully adjudicated. The meeting was presided over by R. Dawson Hall. Simultaneously the directors with a representative group of institute members dined at the hotel.

The next morning, Wednesday, the party assembled on the train for a trip which embraced Ensley blast furnace No. 6, No. 1 steam plant and openhearth plant and the Fairfield car works and steel works of the Tennessee company, the plant of the Phoenix Portland Cement Co. and the Tarrant City pipe works of the National Cast Iron Pipe Co. At the Portland Cement works, lunch was served, and the party visited the open pit in which the limestone was being mined by steam shovels, the factory where the materials—limestone, shale also from the vicinity and a small quantity of gypsum—were crushed and mixed and where the mixture was calcined and ground.

Perhaps the most interesting visit was to the Tarrant plant. Here cast-iron pipe was being manufactured by the de Lavaud process. This process to quote Richard Moldenke's paper, which by the way was not read at the technical sessions, "consisted in rotating a steel mold at a high rate of speed, introducing therein the proper quantity of molten iron, which through centrifugal force is spread over the mold and this makes the pipe." The molten iron is introduced at bottom of the mold and gradually fed into it as it recedes at such a speed that the interior of the mold is covered evenly by the molten iron to the required thickness. No inner core is provided. The centrifugal action makes the iron thus cast unusually dense and therefore strong. In consequence without any reduction of strength it can be made only 75 per cent as heavy as is customary.

The bell is cast in the same way as the pipe proper and by the same operation. The pipe thus made is remarkably smooth but being cast in a water-cooled mold is too hard on its exterior surface. This chill is corrected in an annealing furnace in which the heat is gradually imposed and removed. After this the pipe is cleaned, dipped and tested. The company still makes the pipe by the sand-mold process, which takes 72 hr. for the completion of the entire operation from the making of the mold to the testing of pipe, both inclusive. The new pipe are made, annealed, dipped and tested in 3 hr.

In the evening of Wednesday a banquet was held at the Birmingham Country Club at which the speakers were William Kelly, J. V. W. Reynders and John McLeish, the last named being the Director of the Mines Branch of the Canadian Geological Survey. George Gordon Crawford presided.

Next morning the party visited Muscle Shoals dam



**Blast Furnace of Tennessee Company at Ensley, Ala.**

At this plant are six skip-filled blast furnaces each having four stoves which are heated by waste gases and which raise the blast to 1,300 deg. F.

which was explored from top to bottom, the members and guests going down the penstocks by ladders and thence down the Moody spreading draft tubes. A visit was made to nitrate plant No. 2 where nitrates were made by the cyanamid process. The plant will develop 80,000 hp. at low water and 600,000 hp. for 25 per cent of the time provided turbines and generating machinery are provided for that purpose. The intention is to install at an early date enough units to develop 240,000 hp. whenever that quantity of water power is available. Late that evening the party left for Washington arriving at midnight of Friday after several days of strenuous activity but with happy memories of a visit that none of the party will forget as long as he lives.





## News Of the Industry



### Soft-Coal Industry Takes Belated Steps To Meet Fuel-Oil Competition

National Coal Association Authorizes Program of Research—Interests of Coal and Oil Producers Similar, Both Suffering from Overdevelopment—May Join Hands to Effect Economies

BY PAUL WOOTON  
Washington Correspondent of *Coal Age*

That the bituminous-coal industry is taking cognizance as never before of fuel-oil competition was indicated clearly at the recent meeting of the board of directors of the National Coal Association. The board has given its unqualified approval to the research committee which Harry L. Gandy, the association's secretary, had set up without authorization on the chance that the directors would hold up his hands. Not only was a program of research authorized but the members of the board indicated clearly that the time has passed when the industry can afford to ignore the competition which oil is offering.

There have been fuel-oil menaces before. In the swing of the economic cycle this competition would diminish to the point where sight was lost of the fact that it has for many years been an important competitor. Oil and coal are competitive sources of power and heat. Ordinarily oil can compete importantly only when power is produced in internal combustion engines whose greater thermal efficiency, lighter weight and adaptability to small scale installation have offset a much higher unit price.

The extraordinary development of the gasoline engine has robbed coal of much of the increase which otherwise would have come in the consumption of that fuel. The average coal man does not realize that gasoline has been a serious competitor for thirty years, but the facts are that this country has an installation in automobiles of 400,000,000 hp., as compared with an installation of 70,000,000 hp. in steam-driven transportation. This gives an indication of the potential demand which would have been supplied in part at least by coal had it not been captured by gasoline.

There has been a keener realization of the competitive possibilities of fuel oil because it could be visualized burning in the same equipment which formerly used coal. In the past fuel oil menaces have been caused chiefly by the high cost of coal. The present invasion of fuel oil is made possible by the low price of petroleum. It was brought about largely by the simultaneous discovery in 1923 of six record-breaking pools, Smackover, Powell,

Huntington Beach, Santa Fe Springs, Long Beach and Tonkawa. All of these great pools reached the peak of their production within a few months of each other and contributed to the greatest overproduction of crude petroleum since the Cushing field days of 1914.

Instead of the interests of the coal producer and the oil producer being in conflict they really are identical. It is only natural that the oil producer, finding himself with a great supply which he cannot choke off, should seek new markets. The condition, however, which drives him into the boiler-fuel market is a very unsatisfactory one to him, just as an overproduction of coal makes for an unsatisfactory state of the coal business.

#### Too Many Mines and Wells

Oil and coal are suffering from the same trouble—the tendency to overproduce. There are too many mines and there are too many oil wells. The thought now is being put out from a high official source that there must be co-operative action within the industry to prevent waste and hold development in check until additional supplies are needed. While the idea is directed primarily toward preventing the production of oversupplies of oil there also is official consideration being given a joining of hands by the producers of the two great fuels in an effort to effect colossal economies.

While the present wave of fuel-oil competition has lasted longer than any of its predecessors the time will come when it will recede. In fact there are signs already that production at the new pools is on the downgrade. But unless constructive steps are taken to bring about co-operation to prevent overproduction, a new glut of oil will be forthcoming before long with the discovery of some other field or because of the present significant trend of carrying oil production to new depths.

Even if the United States should run through its reserves of flowing oil there will be new floods of it from Mexico, from the Caribbean, from South America, or some other source. These waves of overproduction will keep on coming. For that reason it is argued that men in the coal and oil in-

dustries should take common counsel and effect a revision of the antiquated laws which at present compel waste and overproduction. The competition is of a character that the coal industry cannot meet alone. If the price of coal be reduced through wage cuts or other expedients it simply will mean that the level of fuel-oil prices will be reduced. There can be no bottom to price when there is an oversupply which must be disposed of.

Fuel oil for domestic use is quite another problem. The industrial user will turn back to coal just as quickly as oil ceases to be the best bargain in B.t.u.'s. The domestic user is discovering that oil has more than its B.t.u. content. It is clean and convenient. The thousands of householders now using oil will not go back to coal if oil prices rise. They have been spoiled by the simplicity of the oil burner. They will not burden themselves again with the dust and the ashes of coal in this day of few domestic servants. It will be just as hard to change them as it would be to wean the anthracite users of New England from their diet of stove and chestnut. The bituminous industry must find a way to give coal the same convenience and cleanliness as oil now affords. The consensus is that this will not be particularly difficult if the coal producers will stimulate the necessary experimentation.

#### House Heating Antiquated

It is curious that the attention to fuel economy which has revolutionized power-plant practice in recent years has not been widened to include house heating. The average house-heating plant today is a medieval thing still burning lumps and paying fancy prices for them. Stoking still is done by hand. The toting of ashes is as prevalent now as one hundred years ago. Fuel is burned raw and waste gases go up the stack. Radiation losses average as high as ever and there continues to be alternate under- and overheating of rooms. In fact, all of the things which are regarded as bad boiler-room practice are the rule in the handling of house-heating plants.

If the National Coal Association will hold out sufficient inducements—and the producers of coal have more to gain than has anyone else—way soon will be found to burn coal as a powder or as a gas. Automatic stokers will be devised. Combustion will be controlled by thermostats. The question is more one of how and when rather than will it be done. It may take a long time to work out the problems if they are left to individual inventors working on shoestring resources, but if the research is properly financed results may be expected promptly.



## Ruhr Coal Syndicate Gets \$2,500,000 Credit Here

An acceptance credit to the extent of \$2,500,000, which a few weeks ago was under negotiation between representatives of the Ruhr Coal Syndicate and a group of American financiers, has finally been arranged, it became known last week, the American bankers in the transaction being Goldman, Sachs & Co. The credit is to finance the export of Ruhr coal, in which German industrialists such as the Krupps, Stinnes and others are interested.

This move is regarded as forecasting the participation of American bankers in the financing of other major European industries, especially since the Allies have insisted that the Ruhr coal operations constituted the backbone of the whole industrial program of Central Europe, with steel, iron and other industries absolutely dependent upon Ruhr coal.

## Penna Sees Black Future For Union Coal Fields

Phil H. Penna, secretary of the Indiana Bituminous Coal Operators' Association, is not optimistic concerning the coal industry in Indiana or in any union field for that matter, and he objects to the fact that a government report terms Indiana's business "good."

"There is no hope for the coal industry during the life of the Jacksonville agreement," stated Mr. Penna, referring to the contract executed by the United Mine Workers and the operators of the union fields at Jacksonville, Fla., last January.

"My opinion," Mr. Penna said, "is based upon two facts: First, that the nation is now taking its ordinary requirement of ten million tons weekly, and second, that the surplus of the non-union fields could be utilized and will be utilized, if the country ever requires it, before our coal will be wanted. With the nation getting its required amount now, and with a large surplus supply of non-union coal in store, how can the union operators expect a revival of the industry in their fields?"

Reports compiled by the Indiana Coal Traffic Bureau show an increase in production in the Indiana field within the last month of 225,204 tons, but it is of little consequence, according to Mr. Penna. The domestic demand probably is the cause of the increase, but the percentage of production which goes for domestic use is very small in normal times.

"During the week ending Sept. 27," he said, "the Indiana mines worked 41 per cent of potential time; the Illinois mines 50 per cent; the southern Ohio field 20 per cent; the Pittsburgh field 49 per cent, and the northern and central Ohio fields 66 per cent. The northern and central Ohio fields enjoy a much better business than the other fields named because they are close to the lakes and have the advantage of the lakes for shipping.

"The non-union fields of Kentucky work an average of 73 per cent, the Logan non-union field worked 63 per

## Union in West Kentucky Is Dying Hard

Miners in what is left of the union district 23, in western Kentucky, declare the resignation this month of President Lonnie Jackson and the appointment of West Ames to fill the vacancy signifies no change in the union no-surrender policy. The region has been on strike for six months and half of western Kentucky is working non-union. The former president is publicly declaring, however, that the Lewis policy of "no backward step" is dead wrong and that western Kentucky is being sacrificed to the bullheadedness of the union administration. He urges that a reduction in wages be allowed so that the union can continue in the region. Jackson has favored a wage cut ever since the strike started, but Lewis ordered him to continue the strike or resign. He resigned.

cent during the week ending Sept. 27, the Pocahontas non-union field worked 75 per cent, the Winding Gulf non-union field worked 57 per cent, the Panhandle non-union field worked 61 per cent, and the Westmoreland non-union field, near the Pittsburgh union field, worked 57 per cent.

"The non-union fields, the report shows, are working about two-thirds of the time, while the Indiana mines are working much less than half time."

## Will Strive to Bring Public And Operators Closer

Instructing its committees to speed up their work in an effort to better serve the public, the National Coal Association, through its board of directors, in session at Washington last week, took steps to broaden the sphere of the association's activities. The association purposes, through its own efforts, bringing about a more satisfactory use of coal and a closer relationship between operators and their customers and the public.

The submission of a questionnaire to retail dealers and household users of coal in order that the industry may definitely ascertain the public viewpoint, was authorized at a meeting of the new Research Committee of the association and later confirmed by action of the board.

To bring about uniform accounting methods in connection with Bureau of Internal Revenue reports, a special tax and cost accounting committee was authorized.

There was apparent a desire to eliminate any basis for criticism, and the meeting is said to have been one of the most successful the National Coal Association has ever held. It was attended by directors from 14 bituminous coal producing states and was presided over by S. Pemberton Hutchinson, of Philadelphia, the new president.

## Miners Call Off Strike at Glen Alden Collieries

Scranton, Pa., Oct. 20.—The recent strike called by the general grievance committees of the Glen Alden Coal Co. miners in Luzerne and Lackawanna valleys has ended. The strike was called in defiance of the district and International union leaders. W. W. Inglis, president of the coal company, as a member of the conciliation board, sent a telegram to International President Lewis of the miners' union calling his attention to the threatened strike and Mr. Lewis in turn notified the district leaders to try to halt the walkout, but in spite of his efforts several thousand men failed to report for work on Oct. 15. It is said that because of the illegal walkout the charters of certain locals at Glen Alden mines will be revoked by the International union.

## New York Bids Numerous and Wide in Range

Bids opened on Oct. 14 by the Board of Purchase of New York City for furnishing and delivering to various city departments 68,917 net tons of various sizes of anthracite, resulted in the following tenders:

Borough of Manhattan—10,589 tons egg coal, \$12.57 to \$13.98 per ton; 1,667 tons stove coal, \$12.96 to \$14.62; 605 tons chestnut coal, \$12.93 to \$14.62; 810 tons pea coal, \$8.87 to \$9.55; 1,170 tons broken coal, \$11.93 to \$13.50; 12,000 tons No. 1 buckwheat, \$5.76 to \$6.50, and 84 tons Georges Creek Cumberland coal, \$8.10 to \$10.50.

Borough of Brooklyn—8,300 tons egg coal, \$12.47 to \$12.62 per ton; 1,836 tons stove coal, \$12.61 to \$14.62; 390 tons chestnut coal, \$12.61 to \$14.62; 146 tons pea coal, \$9.04; 10,000 tons No. 1 buckwheat, \$5.76 to \$5.89, and three tons Georges Creek Cumberland coal, \$9 to \$9.04.

Borough of Queens—2,925 tons egg coal, \$12.61 to \$13.50 per ton; 124 tons stove coal, \$13.25 to \$14.25; 232 tons chestnut coal, \$12.98 to \$14.62; 144 tons pea coal, \$9.04 to \$9.41; 3,000 tons No. 1 buckwheat coal, \$5.76 to \$6.40, and three tons Georges Creek Cumberland coal, \$7.90 to \$9.04.

Borough of the Bronx—4,005 tons egg coal, \$12.62 to \$13.73 per ton; 1,131 tons stove coal, \$13.04 to \$14.62; 149 tons chestnut coal, \$12.93 to \$14.62; 850 tons pea coal, \$8.87 to \$9.55; 5,000 tons No. 1 buckwheat coal, \$5.73 to \$6.40, and 24 tons Georges Creek Cumberland coal, \$8.10 to \$9.04.

Borough of Richmond—805 tons egg coal, \$12.13 to \$13.90 per ton; 61 tons stove coal, \$12.48 to \$14.62; 150 tons chestnut coal, \$12.48 to \$14.62; 21 tons pea coal, \$9.11 to \$10.50, and 1,000 tons No. 1 buckwheat, \$5.93 to \$6.75.

For furnishing and delivering 230 net tons of egg coal to the Bronx Park Department bids ranged from \$12.83 to \$14.25 per ton.

The time of delivery of the above tonnages, with the exception of that for the Bronx Park Department, is to March 31, 1925. The tonnage for the Park Department is to be delivered by Dec. 31 of this year.



## Rate from Pocahontas Field To Washington Lowered

The Interstate Commerce Commission has authorized a departure from the fourth section of the Interstate Commerce Act, which will give Washington, D. C., a much lower rate on coal from the Pocahontas field. The rates which will be in effect as soon as the tariffs can be published are \$2.84 from the Pocahontas district, \$3.09 from the Thacker district, and \$3.19 from the Kenova district. The effort to effect this departure from the fourth section was a part of the movement toward making available at lower prices substitutes for anthracite. When the commission last year undertook its investigation to ascertain whether or not substitutes for anthracite could be made available in New England and the North Atlantic states, George S. Pope, manager of the Government Fuel Yard in Washington, asked that the Norfolk & Western R.R. be required to establish rates from the Pocahontas field to Washington on the same basis as those in effect from the New River field.

The Norfolk & Western was willing to put the rates into effect, but a difficulty arose by reason of the fact that the rates from the Pocahontas field to points on the Southern Ry. between Lynchburg and Washington were higher than the proposed rate to Washington. For this reason it was necessary to obtain authority before a lower rate could be charged to Washington than was in effect to intermediate points.

## End West Virginia Strike After Six Months

A strike of 800 miners of the Kelly's Creek Colliery Co., at Ward, W. Va., which has dragged along for six months, came to an end Oct. 17 when it was announced that the concern had signed an agreement with the United Mine Workers of America, under the 1923 scale. A similar contract was signed by the Miners & Consumers Coal Co., employing 130 men, at Morrisville, W. Va.

These two companies are the only concerns in this field operating under union agreements. Negotiations with other companies are under way.

## Keeney Says Miners Should Not Vote for Davis

Labor organizations should oppose the candidacy of John W. Davis for the presidency, said C. F. Keeney, former president of district No. 17, of the United Mine Workers (West Virginia), and William Blizzard, an aide, in an interview in Indianapolis, Ind., recently. The two men assert that they represent District 17 in opposing the candidacy of Mr. Davis on the ground that he has the support of "the great anti-union combine of industrial interests in West Virginia which has seized control of government there and converted the agencies of public authority into instruments of private warfare upon labor unions and organizations of workers."

## Coolidge Decries Federal Control of Industries

Speaking at Philadelphia, President Coolidge opposed government control of railroads, industries and utilities. "If the people lose control of the arteries of trade and the natural resources of mechanical power, the nationalization of all industry could soon be expected," the President said. "Through the breaking down of the powers of the courts lies an easy way to confiscation of property. With railroads and utilities under political control, the domination of a group would be so entrenched in government that the privilege of citizenship would consist largely in payment of taxes. Leave the people in the ownership of their property."

## Says Big Four Should Build Connection to Dering Mine

The Big Four R.R. should be ordered to make switch connections with the coal mine of the J. K. Dering Co. at Eldorado, Ill., in the opinion of W. P. Bartel, of the staff of the Interstate Commerce Commission, in his report to the commission. The coal company alleges that the failure of the Big Four to establish connections with its siding has made impossible the full development of its 3,400 acres of coal land in Saline County, where it has 30,000,000 tons of coal still unmined. At present the property is served only by the Illinois Central, which is not in a position to handle the 3,500 tons which the mine can produce daily.

The railroad company contends that the building and maintenance of such track as the coal company has constructed is not authorized by its state charter; that such a track, by reason of contracts with the Illinois Central and the Southern Illinois Railway & Power Co., under the law of Illinois, is a public track and that an order requiring the extension of the Big Four tracks in effect would be the taking of property without due process of law; that the connection is not practicable and will not furnish sufficient business to justify its construction; and that the proposed connection with a new railway has not been authorized under the state law. It is the conclusion of the staff of the Commerce Commission that there is sufficient business to justify the connection and that it can be put in with safety.

## Coronado Case Up Again

The latest phase of the noted Coronado coal case, an appeal by Finley, receiver, against the United Mine Workers of America, will be heard by the U. S. Supreme Court on Monday, Jan. 5, a motion to advance the argument having been granted Oct. 20. The case involves the financial responsibility of the international union and subordinate organizations for damages to mining property in Arkansas suffered during strike disorders. This is the second time the issue has been before the Supreme Court.

## Coke Output in 1923 Makes Record for the Industry

Output of beehive and byproduct coke combined in 1923, according to final returns by the U. S. Geological Survey, was 56,977,000 net tons, the largest in any year in the history of the industry, even exceeding the wartime maximum. The final figures are 2.7 per cent higher than the preliminary estimates published Jan. 15, 1924.

Of the production, 37,597,664 tons, valued at \$257,591,318, or about 66 per cent of the total, consisted of byproduct coke, while 19,379,870 tons, valued at \$115,905,580, was beehive coke. The average yield of coke from coal in the case of byproduct fuel was 69.3 per cent, while in the case of beehive coke it was 64.4 per cent.

The returns involved 11,156 byproduct ovens, of which 3,094 are in Pennsylvania, 1,619 in Ohio, 1,213 in Indiana and 1,196 in Alabama, with the others scattered. The byproduct coke used in blast furnaces or affiliated work amounted to 27,055,397 tons, valued at \$168,379,600.

Merchant sales of furnace byproduct coke totaled 1,460,538 tons, valued at \$9,847,055, while sales of byproduct coke for foundry use aggregated 1,897,955 tons, valued at \$19,995,342. Byproducts obtained from coke oven operations and sold in 1923 were valued at \$112,075,945. Of this total 884,952,912 lb., valued at \$25,954,413, consisted of ammonia sulphate as against a production of 915,926,762 lb. Motor benzol products totaled 80,467,883 gallons, while the amount sold exceeded this somewhat and consisted of 80,480,326 gallons, valued at \$13,145,833.

Of the beehive coke produced last year, 6,437,771 tons, valued at \$39,326,693, consisted of merchant sales of the furnace grade, while foundry beehive coke sales amounted to 1,702,764 tons, valued at \$12,259,196. The production of beehive coke reported came from 62,349 ovens, of which 37,578 are in Pennsylvania, 8,055 in West Virginia, 6,199 in Alabama, 3,284 in Virginia, 1,767 in Tennessee, 1,758 in Colorado, and 1,030 in New Mexico, the remainder being scattered.

## Important Cases Reassigned By Supreme Court

Among the important cases set for argument before the U. S. Supreme Court on Nov. 10, which have been reassigned for Nov. 17, are the Cranberry Creek Coal Co. case questioning the legality of the anthracite tax imposed in the State of Pennsylvania and one involving the constitutionality of the Kansas Industrial Relations Act, attacked by the Charles Wolff Packing Co.

Coal to the extent of 3,121,576 tons was used in connection with the manufacture of glass during 1923, the Bureau of the Census reports. Similar figures covering other industries are as follows: Photo-engraving, 2,748 tons; enameling and japanning, 13,923 tons; lasts and related products, 12,014 tons.



Finance Coal Storage by  
Recourse to Banks and  
Employers, Engineers Say

Banks will finance storage for employers, and employers will finance storage for wage earners, according to a report just made by the Coal Storage Committee of the American Engineering Council on the feasibility of financing coal in storage.

Because of financial and housing conditions many wage earners cannot store their coal without financial aid in some form. "Several employers," says the engineers' report, "purchase and store a quantity of coal which is subsequently sold to employees at cost. A few render aid only in periods of severe coal shortage. Another obtains coal from a dealer, paying in full and deducting payments in reasonable installments. Several sell their byproduct coke and coke breeze at cost.

"In one company an employee mutual benefit association forms to pool purchases for members. A number of plants operate and handle on a club plan. One concern allows employees to select a dealer to whom the company pays in full, deducting the amount from wages in equal installments.

"Another organization purchases a run of mine coal and picks out lumps which are sold to employees at very low cost, the company utilizing the remainder. One company charges cost plus a reasonable amount to cover the expense of a man competent to handle purchases and delivery."

In general, according to the American Engineering Council's report, it may be said that satisfactory arrangements can be made to finance the storage of coal and very much in the same way that other transactions are financed, that is by bank loan, deferred payments, or carrying the account with operating capital.



Howard W. Showalter

President of the Diamond Coal Co., Fairmont, W. Va., and named by Governor Morgan as one of the delegates to represent West Virginia at the annual convention of the American Mining Congress, at Sacramento, Cal., Sept. 29-Oct. 2.

Coal Consumption and Power  
Output by Utilities Climb

Electric public-utility plants consumed 2,948,998 net tons of coal during August, according to a report by the Geological Survey. This compares with 2,787,724 tons consumed in July and 2,679,859 tons in June, according to revised figures. Fuel oil consumed by utility plants during August totaled 1,498,730 barrels, compared with 1,431,310 barrels in July and 1,344,632 barrels in June.

The average daily production of electricity by public-utility power plants during August was 152,700,000 kw.-hr., which is about 2½ per cent greater than the daily output during July.

Dominion Government to  
Aid Shipment of Coal to  
Central Canadian Districts

Shipment of Maritime Provinces coal to central Canada is to receive government assistance, providing the railways make reductions in their present published freight rates on coal. Under an order-in-council, just passed by the Dominion Cabinet, Charles Stewart, Minister of Mines, is enabled to pay a subvention of ¼c. per ton mile on coal shipped wholly by rail from eastern Canada to stations in Ontario and Quebec west of Riviere du Loup. On waterborne coal from the Maritime Provinces the same subvention is allowed on the railway haul from the port of transshipment to destination.

This assistance will be given out of an appropriation voted last session by Parliament to aid in the transportation of Western and Eastern coal to central Canada. At that time it was thought that with this aid considerable quantities of coal from Alberta would be placed on the markets in central Canada. But the prolonged strike in that Western province makes such a development unlikely this season. Of the \$200,000 voted not more than \$150,000, according to the terms of the order-in-council, may be used to assist the transportation of coal from eastern Canada.

An important restriction in regard to the subvention is that the government will not give more than 50c. a net ton on any single shipment, nor are payments to be made where Canadian coal is not in competition with United States coal. No grant will be given on shipments for use on railway locomotives.

The Dominion Fuel Board, which will administer the grant, reports that the railways concerned have already agreed to make a reduction in their coal rates.

Output and Value of Coal Produced in the United States, by States, in 1923

(Compiled by the U. S. Geological Survey)

State	Loaded at Mines for Shipment (Net Tons)	Sold to Local Trade and Used by Employees (Net Tons)	Used at Mines for Steam and Heat (Net Tons)	Made Into Coke at Mines (Net Tons)	Total Quantity (Net Tons)	Total Value	Average Value per Ton	Number of Employees				Average Number of Days Worked
								Underground			Total	
								Miners a	Others	Surface		
Alabama.....	19,520,634	370,754	307,356	258,905	20,457,649	\$51,624,000	\$2.52	17,304	7,330	5,401	30,035	232
Alaska.....	104,867	12,734	2,225	.....	119,826	755,000	6.30	73	48	78	199	220
Arkansas.....	1,245,350	12,845	38,697	.....	1,296,892	5,192,000	4.01	2,124	846	784	3,754	97
California, Idaho and Oregon.....	11,256	1,555	7,255	.....	20,066	79,000	3.94	43	26	24	93	206
Colorado.....	9,390,124	534,464	231,595	190,035	10,346,218	33,299,000	3.22	8,064	3,114	2,162	13,340	174
Georgia.....	48,172	733	2,554	24,161	75,620	327,000	4.32	69	23	75	167	231
Illinois.....	73,842,388	3,606,769	1,860,918	.....	79,310,075	198,388,000	2.50	64,194	24,900	10,620	99,714	158
Indiana.....	24,951,649	697,832	579,618	.....	26,229,099	65,046,000	2.48	22,777	8,228	4,403	35,408	136
Iowa.....	5,027,502	556,180	127,053	.....	5,710,735	20,517,000	3.59	7,797	2,709	942	11,448	181
Kansas.....	3,833,377	119,752	82,275	.....	4,035,404	12,981,000	3.22	5,534	1,269	982	7,785	149
Kentucky.....	43,149,962	844,094	552,943	230,318	44,777,317	113,542,000	2.54	33,911	16,546	10,354	60,811	152
Maryland.....	2,181,688	77,823	26,415	.....	2,285,926	6,911,000	3.02	2,360	814	551	3,725	178
Michigan.....	1,086,198	16,235	69,642	.....	1,172,075	5,545,000	4.73	1,213	580	184	1,977	222
Missouri.....	3,101,275	211,447	90,429	.....	3,403,151	11,575,000	3.40	4,217	1,335	1,400	6,952	155
Montana.....	2,934,829	118,060	94,789	.....	3,147,678	9,652,000	3.07	2,054	910	547	3,511	179
New Mexico.....	2,572,465	38,684	46,689	257,335	2,915,173	10,668,000	3.66	2,522	1,025	548	4,095	216
North Carolina.....	29,419	1,700	4,900	.....	36,019	132,000	3.66	55	70	25	150	275
North Dakota.....	1,128,318	218,574	38,508	.....	1,385,400	3,275,000	2.36	883	257	481	1,621	182
Ohio.....	37,273,886	2,672,268	600,289	.....	40,546,443	98,610,000	2.43	34,121	12,225	8,209	54,555	150
Oklahoma.....	2,722,387	37,998	117,022	7,631	2,885,038	10,874,000	3.77	4,100	1,930	1,100	7,130	133
Pennsylvania (bitumin.)	138,275,133	7,359,213	2,507,227	23,738,340	171,879,913	472,217,000	2.75	120,385	46,183	28,413	194,981	213
South Dakota.....	2,000	8,379	.....	.....	10,379	25,000	2.41	34	.....	.....	34	122
Tennessee.....	5,614,117	119,657	115,783	190,711	6,040,268	16,515,000	2.73	6,752	2,733	1,759	11,244	183
Texas.....	1,156,901	6,564	23,864	.....	1,187,329	2,162,000	1.82	1,641	493	318	2,452	178
Utah.....	4,179,293	56,471	81,399	403,054	4,720,217	13,657,000	2.89	2,379	1,063	939	4,381	160
Virginia.....	10,292,691	212,131	96,041	1,160,780	11,761,643	32,468,000	2.76	6,810	4,841	2,469	14,120	212
Washington.....	2,697,984	80,881	87,973	59,554	2,926,392	10,894,000	3.72	2,313	1,147	846	4,306	213
West Virginia.....	101,961,199	3,841,346	758,904	1,338,492	107,899,941	285,481,000	2.65	62,676	35,207	19,417	117,300	169
Wyoming.....	7,264,816	97,567	212,648	.....	7,575,031	20,916,000	2.76	4,203	2,020	1,306	7,529	192

(a) Includes also loaders and shotfirers.



## Jury Must Convict Before Contempt Sentence

Section 22 of the Clayton Act requiring conviction by a jury as a condition precedent to sentence for contempt of court, if a trial before a jury is demanded, constitutes a valid restriction upon the inherent judicial powers of a U. S. district court, the U. S. Supreme Court held Oct. 20 in replying to a question from the Sixth Circuit Court of Appeals.

The question arose in the appeal of S. C. Sandefur, who was sentenced for contempt by a federal district court in Kentucky on a charge of having violated an injunction against the use of threats and violence during a strike against the Canoe Creek Coal Co. Sandefur was denied a trial by jury on the contempt charge, and appealed, whereupon the Circuit Court of Appeals referred the construction of this clause of the Clayton Act to the Supreme Court for interpretation.

At the same time the Supreme Court, in the appeal of Sam Michaelson and others who were convicted of contempt in Wisconsin on charges of violating an injunction issued the Chicago, St. Paul & Omaha R.R. during the shopmen's strike in 1922, went more fully into Section 22 of the Clayton Act and held that the striking employees were entitled to trial by jury on contempt charges. The District Court and the Seventh Circuit Court of Appeals in this case had held this part of the act unconstitutional. This decision was reversed by the Supreme Court in a decision rendered through Justice Sutherland.

## Trade Associations to Study Uniform Cost Accounting

Representatives of more than 300 trade associations have been invited to attend a conference on uniform cost accounting to be held at the Congress Hotel, Chicago, Oct. 28 and 29. The meeting will be the third of a series held under the auspices of the Department of Manufacture of the Chamber of Commerce of the United States for the purpose of furthering interest in systematic cost accounting work.

The preliminary program for the Chicago conference lists two subjects for consideration on the opening day. One of these is "The Bankers' Interest in Uniform Cost Accounting," to be discussed by J. W. O'Leary, vice-president of the Chicago Trust Company, and the other "The Printer, Uniform Cost Accounting, and the Federal Trade Commission." The latter subject will be discussed by two speakers who will go into the question of the Federal Trade Commission's attitude toward uniform cost accounting activities.

In announcing the preliminary plans for the meeting, E. W. McCullough, manager of the Chamber's Department of Manufacture, makes the point that the adoption of uniform cost accounting by an industry does not mean the destruction of individual systems now in use but only adjusting them in harmony with uniform methods. "Few individual systems," he says, "attain the accuracy and facility of operation found in uniform systems built by the

## Boys Build Pretty Bonfire With Stolen Dynamite

On the basis of information by school teachers that schoolboys had dynamite in their possession, Pottsville (Pa.) police made an investigation last week and announced that three pupils, all less than twelve years old, had confessed taking a box of dynamite from the Sherman Coal Co. and had used the sticks for kindling wood. The boys said they had built a fire with forty of the sticks because they made such "pretty blue flames." The police confiscated the remainder of the loot.

members of an industry who, after careful study, have combined the best found in individual practice, adding to it by way of improvement and advance in technique found in other lines. The advantage of the same practical revision of a uniform system from time to time should not be overlooked."

## World Coal Output for First Half of This Year 655,000,000 Metric Tons

World production of coal during the first half of 1924, according to the U. S. Geological Survey, was approximately 655,000,000 tons, or at the rate of 1,310,000,000 tons a year. This rate was less than that of 1923 but far above 1922 or 1921, and almost equal to the output of 1920. The present level of coal production, however, is still below that of 1913.

In comparison with the corresponding period of 1923 the preliminary figures show a decrease of about 5 per cent. The largest element in this decrease was the lessened production of the United States, as American con-

## Names N. C. A. Committee to U. S. Chamber of Commerce

Representatives of the National Coal Association at the second mid-year meeting of the Eastern Division of the Chamber of Commerce of the United States, which will be held in Washington on Oct. 23 and 24, have been appointed by S. Pemberton Hutchinson, president of the association, as follows: C. W. Watson, president, Consolidation Coal Co., New York City; Michael Gallagher, general manager, M. A. Hanna Co., Cleveland, Ohio; C. C. Watt, president, Loyal Hanna Coal & Coke Co., Philadelphia, Pa.; John L. Kemmerer, president, Whitney & Kemmerer Coal Co., New York City; William A. Evans, vice-president, National Coal Co., New York City; C. E. Bockus, president, Clinchfield Coal Corp., New York City, and J. G. Bradley, president, Elk River Coal & Lumber Co., Dundon, W. Va. Other representatives to the Northern Central, Southern Central and Western Division meetings which will be held at Indianapolis, Memphis and Los Angeles, respectively, will be announced later.

sumers drew upon the heavy stocks they had accumulated last year.

Among the European countries the United Kingdom and Poland also show a decline in comparison with 1923. This decline was more than offset by the partial recovery of German production from the low levels touched during the occupation of the Ruhr. Most of the other European countries also increased their output.

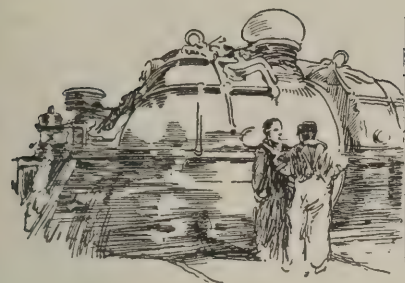
The following table, prepared by W. I. Whiteside, of the Section of Foreign Mineral Reserves, summarizes all information received by the Geological Survey up to Oct. 1 and is subject to material revision as final official figures are received. Lignite and brown coal are included; where possible they are shown separately.

Coal Output of Principal Countries of the World, January-June, 1924, In Comparison with Corresponding Period of 1923

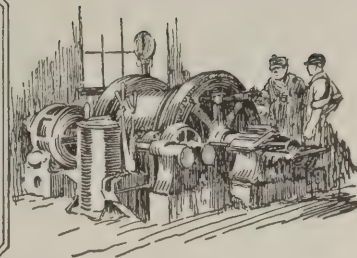
Country		(In metric tons of 2,204.622 lb.)	
North America:		1923	1924
Canada.....		28,003,516	6,160,812
United States.....		294,324,000	248,099,000
Other countries.....		(b)	(b)
South America:			
Chile.....		(b)	715,000
Other countries.....		(b)	(b)
Europe:			
Austria.....	Coal.....	74,698	83,639
	Lignite.....	1,242,196	1,422,510
Belgium.....		11,127,700	12,298,810
Czechoslovakia.....	Coal.....	5,919,835	7,503,500
	Lignite.....	8,725,861	10,346,649
France.....	Coal.....	17,659,350	21,555,062
	Lignite.....	433,741	472,050
Germany.....	Coal c.....	38,776,959	51,498,099
	Lignite.....	65,358,313	58,305,616
Saar.....		2,688,654	6,911,638
Hungary.....		3,807,521	4,000,000
Netherlands.....		2,686,246	2,835,000
Poland.....		18,255,005	15,686,452
Russia (including Russia in Asia).....		5,609,000	7,000,000
United Kingdom.....		143,051,102	141,293,539
Yugoslavia.....		2,063,000	2,000,000
Other countries.....		(b)	(b)
Asia:			
British India.....		10,074,000	11,263,000
Japan.....		15,879,000	14,000,000
Other countries e.....		(b)	(b)
Africa:			
Rhodesia.....		250,447	274,318
Union of South Africa.....		5,222,674	5,528,735
Other countries.....		(b)	(b)
Oceania:			
Other countries.....		(b)	(b)
Total.....		686,000,000	655,000,000

a Revised figures. b Estimate included in total. c Exclusive of Saar, which is shown separately. d Estimated from incomplete data. e Russia in Asia included with Russia in Europe.





## Practical Pointers For Electrical And Mechanical Men



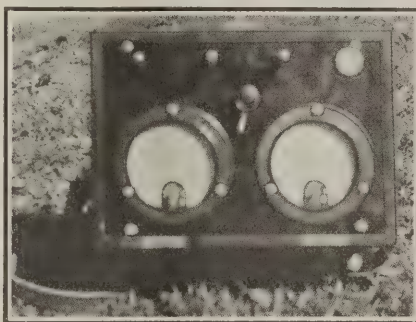
### Few Bond Testers Tell the Truth But Here's One That Will

Instruments Usually Fail To Give Correct Indications of Resistance of Bonds—Accurate Results Obtained by Twin Millivoltmeter Type of Tester

AFTER almost a year's study of methods of bonding and types of bonds, our company decided that much of the controversy over bonding was due to the fact that no instruments were made which gave a correct indication of the resistance of a bond. We therefore designed a bond tester which gives the exact resistance of a bond. After thoroughly proving its suitability we have had one built for each of our larger operations.

The contact bar looks much the same as most types, but whereas the contacts before were all solidly fixed, 3 ft. apart, on ours only the middle contact is fixed; the outer clips are movable. With the old contact bar, where the distance between contacts was fixed at 3 ft., when testing a short 6-in. bond, the result was that six inches of bond and thirty inches of rail was being compared with three feet of rail. Thus this type of tester greatly favored the short bond.

On ours, the middle contact is placed at one end of the bond, an end contact on the bar is set at the other end of the bond and the other contact is set to cover an equal length of rail. Thus with the 6-in. bond, both end contacts would be set six inches from the middle clip and we are comparing six inches of bond with six inches of rail,



This is the Truth-Telling Meter for Bonds

Two millivoltmeters indicate the voltage drop across the bonded section and an equal length of rail. The ratio between the two readings tells the condition of the bond.

giving the correct relation between their resistances.

The contacts are pieces of hack saw blades clamped in a copper terminal clip. The fixed central contact has a compression spring arrangement to allow it to adjust itself vertically to an uneven rail joint, giving a solid contact on all three clips.

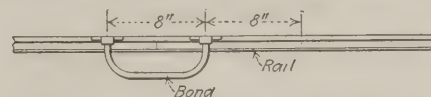
The testing instrument itself is of entirely different design from most instruments. Many bond testers are based in some form of a Wheatstone bridge. One prominent type has the bond balanced against three feet of rail, plus the resistance necessary to form a balance. This resistance is cut in by a sliding arm which also carries a pointer showing the proportion cut in. Another make replaces this variable resistance by a sliding contact on the rail which is adjusted to form a balance. The amount of rail necessary for this balance can then be measured. Two pairs of fixed resistances are often used in these types giving proportions of 1 to 1 or 10 to 1.

Our bond testing instrument is of the twin millivoltmeter type. Its general appearance is shown in the illustration. Instead of having to balance a bridge, always a more or less delicate operation, the operator merely compares the two millivoltmeter readings. As shown in the wiring diagram there are two resistances  $R$  and  $R'$  connected in series with each millivoltmeter, which may be shunted by a

double-pole switch  $S$ . This switch is shown in the upper right hand corner of the picture. In the normal position it is open and the resistance is cut in, when closed it short-circuits the resistance only as long as the button is held in. This is so that the meters will not be accidentally connected directly across a defective bond.

When making a test, the switch is first left open; afterwards it is closed if the bond is intact. The millivoltmeters are ruggedly constructed with 0-100 millivolt scales. The double-pole double-throw switch ( $P$  in the wiring diagram) is shown as the pointer near the center of the picture illustrating the meter it is provided to easily reverse the connections to the meters in case the readings are reversed.

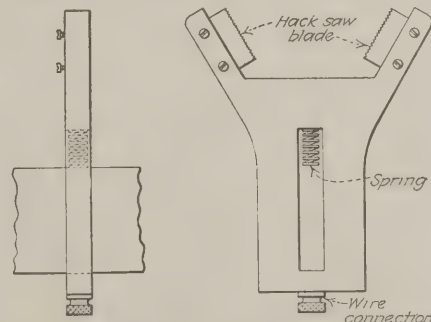
When the instrument is in operation lead  $L 2$  is connected to the center contact bar clip and  $L 1$  and  $L 3$  to the end contacts. These clips are adjusted to cover the bond and an equal length of rail. If the readings of the meters are reversed, turning switch  $P$  will change the connection. If the readings are sufficiently low the switch  $S$  is pressed and the voltmeters are connected directly to the rail while if



Check the Bond Against Equal Rail Section

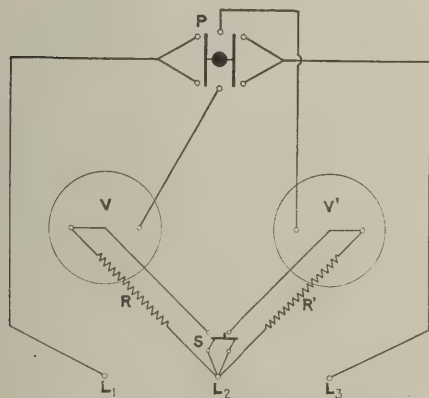
Unless the bonded section of the rail is compared with an equal length of the same size rail incorrect results are obtained. A bond-testing outfit must be adjustable to obtain accurate results.

the readings are high the bond is immediately pronounced defective. With the resistance cut out, readings of each meter are taken and the ratio found.



Contact Makers Which Form Good Connections

Rigid contact bars and terminals will not fit uneven rails. Self-adjusting terminals form best connections and at the same time protect the instruments. Tested leads between the contacts at the rail and the instruments are also necessary for accurate readings.



Internal Connections of Instrument

The line terminals  $L 1$ ,  $L 2$  and  $L 3$  are connected to the corresponding point on the contact bar applied to the rail and bonded section. Series resistances  $R$  and  $R'$  protect the millivoltmeters  $V$  and  $V'$ .  $S$  is a short-circuiting switch to shunt these resistances.  $P$  is a polarity-reversing switch.



This is then compared with that given in the table, which is pasted in each instrument case. If it is higher than that shown in Bond Limit Value Table I, the bond is defective.

These bond testers have been in use for some time at our mines and are considered very satisfactory.

F. FRAZER MACWILLIAMS,  
Power Department.

Pennsylvania Coal & Coke Corp.,  
Cresson, Pa.

### Keep Truck Wheels Lined And Stop the Wiggle

Many bus and truck operators are not aware that the front axles and steering knuckles are so designed that when the wheels are mounted they assume an angle in relation to the chassis frame, both in a vertical and horizontal position; then again the front axle is mounted on the springs in such a manner as to form a slight angle with the chassis frame. Altogether we have three different angles to consider.

The amount of angularity in each case is determined accurately when the vehicle is built and must be so maintained during its operation. Difficult steering, rapid tire wear and even loss of performance ability may be the penalties for neglect of this little-considered point.

The first of these three angles is under-gather, sometimes known as cambre, or incorrectly as dish, which consists of a slight outward leaning at the top of each wheel. This serves several purposes. It places the wheels more nearly perpendicular to the crown of the road. It converts some of the normal radial load on the wheel bearings into a thrust inward, thereby relieving the axle spindle nut of thrust. It gives greater stability against side-thrusts, as in rounding curves, because the inner wheel is always inclined slightly inward of the turn, so that some of the thrust is taken endwise by the spokes, or edgewise by the disk, in a disk wheel, where there is greater strength.

#### WHY WHEELS GRIND

But an inclined wheel has a natural tendency to travel in a circle instead of in a straight line, and if it is constrained to do the latter its tire will no longer roll straight along the road, but will continually grind, thereby wearing rapidly and consuming extra power. To correct this tendency, therefore, the second kind of inclination, namely fore-gather or toe-in is used. This consists of drawing together the front wheels so they are "pigeon-toed." If this fore-gather is figured correctly for the amount of under-gather, the wheels will practically have a true rolling contact and will roll straight.

Third among the trinity of inclinations of motor truck front wheels is what is known as the castor. This is an inclination of the axle itself, whereby the steering knuckles are not vertical, as we usually think of them, but lean backward at the top. This has the same effect as the off-center pivoting of the castors on a piece of furniture. It tends to make the truck travel in a straight line. If it were not for this castor effect, there would

### Automatic Brush Sweeps Dust From Pan Conveyor

Finely divided particles of coal that cling to the flights of a pan conveyor should be removed concurrently with



Dust Collector on Pan Conveyor

This device consists of a brush held in contact with the return flights of a pan conveyor under the tension of two springs thus sweeping to the ground the coal dust that accumulates.

be continual tendency for the truck to run off the road and when the wheels were turned the driver would have to "fight the wheel" to straighten out.

The correct amount of under-gather, fore-gather and castor, of course, varies with each make of vehicle so that in order to keep them as they should be, the correct measurement for the particular truck must be known.

On trucks, the correct amount of under-gather is  $2\frac{3}{4}$  in. By this is meant that the wheels are  $2\frac{3}{4}$  in. closer together at the bottom than at the top, measured at the wheel rim, not the tire rim. This is correct only for 36-in. solid tires. For other sizes the difference in the measurement should be as follows: 32-in. solid or cushion,  $1\frac{1}{8}$  in.; solid or cushion,  $1\frac{1}{4}$  in.; 32-in. pneumatic,  $1\frac{3}{8}$  in.; 34-in. pneumatic,  $1\frac{1}{2}$  in.; 36-38-40 in. pneumatic,  $1\frac{3}{4}$  in.

There is no adjustment for under-gather, as this is obtained by the manner in which the knuckles themselves are machined. These knuckle forgings are so exceedingly stiff that it is unlikely that they will ever become bent. The only things which can change the under-gather, therefore, are wear or faulty adjustment of the wheel bearings, wear of the steering knuckle pin bushings, or rarely, a sprung axle center. Straightening the axle center is the obvious remedy, but it should be heated at the center only, and not more than to a blood-red heat, and then straightened in a press until the steering knuckle pins are parallel. It should then be cooled in oil.

Fore-gather is obtained by the adjustment of the tie rod. The latter is a straight tube running across the front of the axle, having ball sockets screwed on each end. One of these ball sockets may be removed with the ball from the steering arm and adjusted by loosening the two clamp bolts and screwing the ball retainer in or out.

the formation of the deposit. Otherwise, if the conveyor is in a slope, the accumulation becomes so heavy that it soon breaks off in large greasy lumps and falls into the conveyor pit at the bottom of the incline or is deposited on the floor along the entire length of the conveyor. As several tons of this fine sized slack will be thus scattered in one day by a conveyor having a capacity of say 300 tons an hour, clean-ups become imperative. The job cannot be performed economically or entirely satisfactorily by a man with a broom and a shovel because the surfaces on which the dust is deposited are not readily accessible. Consequently, much time is consumed in gathering the dust by this manual method.

At the slope mouth of the No. 14 mine of the Island Creek Coal Co., Holden, W. Va., an automatic brush device is rigged up that sweeps from the pans the dust that accumulates during each round of the conveyor. The device is simple and easily installed. A brush, as long as the conveyor is wide, is attached to two fulcrum bars and held in contact with the return strand of the conveyor by two tension springs as shown in the accompanying illustration.

The measurements controlling this adjustment are taken between the flanges of the rim at the extreme front and rear of the wheels. On Mack trucks with 36-in. solid or cushion tires, the difference between these measurements should be  $\frac{3}{4}$  in. For other tire equipment the difference in measurement should be: 32-in. solid or cushion,  $\frac{3}{4}$  in.; 34-in. solid or cushion,  $\frac{3}{4}$  in.; 32-in. pneumatic,  $\frac{3}{4}$  in.; 34-46-38-40 in. pneumatic,  $\frac{3}{4}$  in.

#### AGE MAKES ADJUSTMENTS NECESSARY

The amount of castor or axle tilt depends upon two considerations, the mounting of the spring on the axle, and the shape and position of the spring itself. A wedge-shaped saddle is inserted between the spring and the spring pad on the axle, and in addition the front spring is mounted on the frame so that its front end is higher than its rear. Sometimes after long and continuous use the spring becomes somewhat distorted from its original form, though still capable of doing its work. In this case, the castor may be affected.

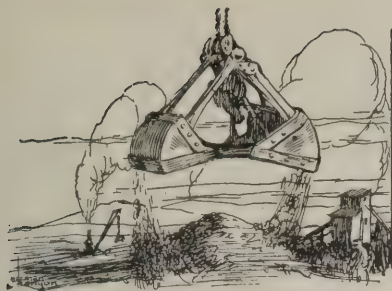
To determine the amount of castor a plumb line should be dropped from the lower edge of the front of the steering knuckle to the floor and the spot marked. A straight edge should then be laid along the steering knuckle, so that it bears on the upper and lower barrels and back of the lip of the central shroud. It should touch the floor  $\frac{1}{8}$  in. ahead of the spot previously marked on the floor. The amount of castor can be varied by shimmed either end of the spring seat.

Too much castor makes turning more difficult, since the front of the truck is actually lifted when the wheels are turned. With correct castor the maximum amount of lift will be 0.017 in.

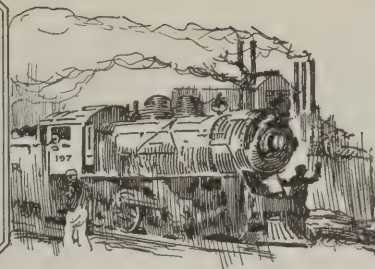
A. H. LEIPERT,  
Service Manager.

International Motor Co.





# Production And the Market



## Soft Coal Market Shows Increased Irregularity But Trend Continues Upward

The bituminous coal market in general is holding its own quite well, though the gains are strikingly uneven; in fact there have been recessions here and there—probably only temporary in most instances. The New England trade continues to show marked strength, with prices headed upward. Unseasonably mild weather in most other sections of the country, however, has had a tendency to take the edge off demand, causing a return in some cases of the hand-to-mouth policy of buying. Western Kentucky is a notable case in point, the brisk spell having tapered off to such an extent that distress coal is now in evidence there. As so often happens, the first quickening in demand proved so tempting to many hungry for business that there has been an over-production in some fields, which with warm weather caused the inevitable setback.

### Trade Barometers Encouraging

Such barometers of trade as car loadings continue to give encouragement regarding general business conditions, despite the prominent part played by grain loading in the weekly reports. Equipment buying by the railroads also continues apace, orders for 1,900 freight cars having been placed by the carriers during the third week of October.

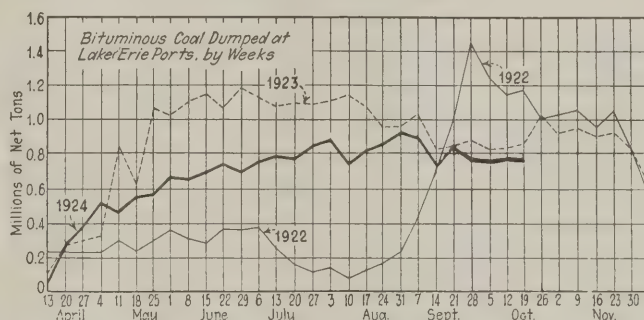
Coal Age Index of spot prices of bituminous coal again advanced last week—for the seventh consecutive time—standing on Oct. 20 at 176, the corresponding price for which is \$2.12. This compares with 174 and \$2.10 respectively on Oct. 13.

There was a slight reaction in activity at Hampton Roads last week, dumpings of coal for all accounts during the seven-day period ended Oct. 16 totaling 326,124 net tons, compared with 340,447 tons handled during the preceding week.

Coal continues to move up the lakes in steady volume, despite the many predictions that it would begin to fade

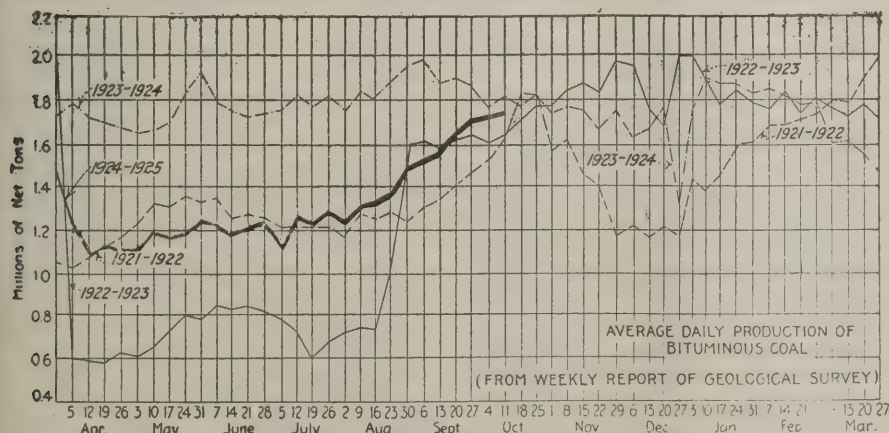
out by this time. Dumpings at Lake Erie ports during the week ended Oct. 19, according to the Ore & Coal Exchange, were as follows: For cargo, 735,770 net tons; for fuel, 40,787 tons, compared with 737,102 and 40,547 tons respectively during the preceding week.

Bituminous coal output continues to increase slowly, production during the week ended Oct. 11, according to the Geological Survey, totaling 10,548,000 net tons, a gain of 273,000 tons over the week ended Oct. 4, when 10,275,000 tons was produced, according to revised fig-



ures. The rate of output now is not far behind that of 1923, though it is still far below that of 1920. Anthracite production rebounded sharply during the week ended Oct. 11, when 1,737,000 net tons was the total compared with 1,425,000 tons during the preceding week.

Producers are moving anthracite without much difficulty, but retailers still feel, despite a slow, steady gain, that business is not all that it should be. Stove is in steady demand, with chestnut a close second. Egg is lagging somewhat and pea is rather hard to move. Steam coals are holding their own fairly well. Independent prices are firm. Most of the mines flooded by the recent heavy rains are resuming production, only a few having failed to get under way.



### Estimates of Production

(Net Tons)

#### BITUMINOUS

	1923	1924
Sept. 27.....	11,347,000	10,140,000
Oct. 4 (a).....	10,699,000	10,275,000
Oct. 11 (b).....	10,953,000	10,548,000
Daily average.....	1,826,000	1,758,000
Cal. yr. to date (c)...	432,665,000	352,896,000
Daily av. to date.....	1,799,000	1,463,000

#### ANTHRACITE

Sept. 27.....	1,959,000	1,942,000
Oct. 4.....	1,949,000	1,425,000
Oct. 11.....	1,943,000	1,737,000
Cal. yr. to date.....	73,514,000	71,013,000

#### COKE

Oct. 4.....	312,000	138,000
Oct. 11.....	284,000	129,000
Cal. yr. to date (c)...	15,047,000	7,726,000

(a) Revised since last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.



## Midwest Market Is Slower

The continued warm weather throughout the entire Middle West has shown its effect on every size from every field, although Franklin, Williamson and Saline counties in Illinois still are far behind on lump orders, which is due to short running time. No new business has presented itself. Domestic egg and nut sizes are somewhat easier with a tendency to cut prices. There is still a good deal of "no-bill" coal. Operators in this field will cut prices on their surplus only where they feel it will not harm them, storing the coal rather than slashing prices.

Screenings will bring only what the buyer is willing to pay. Where the larger mines are holding firm at \$1.40@ \$1.50 for 1½ in. and 2 in. screenings, respectively, off-grades move at \$1@ \$1.25. Central Illinois fields are working more regularly than in southern Illinois, holding the price on 6 in. lump to \$3, selling other sizes at the best price obtainable.

Indiana Fourth Vein is fairly firm; mines are not operating steadily and there seems to be a demand for about what is offered for sale. Fifth Vein operators are having some difficulty in moving tonnage. Indiana screenings prices are from 80c. on Fifth Vein to \$1.25 on Fourth Vein.

Western Kentucky is much easier to obtain; operators are accepting orders and ship them promptly at from 10c. to 25c. off the list price on domestic sizes. Their screenings

are obtainable at 70c.@ \$1. Pocahontas screened lump and egg cannot be had lower than \$4.50@ \$4.75. Old line companies' mine run is holding firm at \$2@ \$2.25, but considerable good quality Pocahontas and New River mine run from independent operators is offered through jobbers at \$1.50.

There has been a slight let-up in the demand for domestic coal on account of the warm weather in southern Illinois. Lump and egg are holding up well but nut and the other sizes are a drag on the market. Steam coal is unusually slow and a number of mines are storing it. Many mines are unable to work full time because of unbilled coal and other mines are unable to start up because of no market for these sizes. Prices are unchanged, however. Railroad tonnage continues fair. Car supply is good. Mines are averaging three to four days a week.

In the Duquoin and Jackson County fields domestic conditions are good. Mines are getting three days a week, but are unable to sell steam sizes. The Mt. Olive district shows greater activity than elsewhere considering its dormant condition for the last six months. There is good movement for domestic and railroad coal and steam seems to be moving better here than in any other field. Mines are getting four and five days a week. Conditions are still bad in the Standard field, many mines selling coal below cost on account of the steam market, and nearly all of them have unbilled coal on hand all the time.

## Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern					Midwest						
Market	Quoted	Oct. 22 1923	Oct. 6 1924	Oct. 13 1924	Oct. 20 1924†	Market	Quoted	Oct. 22 1923	Oct. 6 1924	Oct. 13 1924	Oct. 20 1924†
Smokeless lump	Columbus	\$6.35	\$4.35	\$4.35	\$4.35@ \$4.65	Franklin, Ill. lump	Chicago	\$4.10	\$3.35	\$3.35	\$3.25@ \$3.50
Smokeless mine run	Columbus	3.85	2.20	2.20	2.25@ 2.50	Franklin, Ill. mine run	Chicago	2.60	2.35	2.35	2.25@ 2.50
Smokeless screenings	Columbus	1.35	1.20	1.20	1.25@ 1.35	Franklin, Ill. screenings	Chicago	1.45	1.35	1.35	1.25@ 1.50
Smokeless lump	Chicago	6.10	3.85	3.85	4.50@ 4.75	Central, Ill. lump	Chicago	3.10	2.85	2.85	2.75@ 3.00
Smokeless mine run	Chicago	2.85	1.90	1.90	1.75@ 2.25	Central, Ill. mine run	Chicago	2.10	2.20	2.20	2.15@ 2.25
Smokeless lump	Cincinnati	5.85	4.10	3.85	4.00@ 4.75	Central, Ill. screenings	Chicago	2.90	1.15	1.15	1.10@ 1.25
Smokeless mine run	Cincinnati	2.50	2.25	2.35	2.00@ 2.25	Ind. 4th Vein lump	Chicago	3.35	3.10	3.10	3.00@ 3.25
Smokeless screenings	Cincinnati	1.75	1.15	1.30	1.10@ 1.25	Ind. 4th Vein mine run	Chicago	2.60	2.35	2.35	2.25@ 2.50
Smokeless mine run	Boston	4.55	4.25	4.30	4.35@ 4.50	Ind. 4th Vein screenings	Chicago	1.20	1.35	1.35	1.25@ 1.35
Clearfield mine run	Boston	1.95	1.90	1.90	1.65@ 2.50	Ind. 5th Vein lump	Chicago	2.50	2.85	2.85	2.75@ 3.00
Cambria mine run	Boston	2.50	2.25	2.30	2.35@ 2.85	Ind. 5th Vein mine run	Chicago	2.10	2.10	2.10	2.00@ 2.25
Somerset mine run	Boston	2.25	2.05	2.05	1.75@ 2.35	Ind. 5th Vein screenings	Chicago	.80	1.25	1.25	.80@ 1.10
Pool 1 (Navy Standard)	New York	3.05	2.75	2.75	2.50@ 3.00	Mt. Olive lump	St. Louis	3.10	2.85	2.85	2.75@ 3.00
Pool 1 (Navy Standard)	Philadelphia	3.15	2.70	2.70	2.50@ 2.90	Mt. Olive mine run	St. Louis	2.25	2.50	2.50	2.50
Pool 1 (Navy Standard)	Baltimore		2.60	2.60	2.40@ 2.85	Mt. Olive screenings	St. Louis	1.25	1.25	1.25	1.35
Pool 9 (Super. Low Vol.)	New York	2.35	2.10	2.10	2.00@ 2.25	Standard lump	St. Louis	3.10	2.85	2.85	2.75@ 3.00
Pool 9 (Super. Low Vol.)	Philadelphia	2.45	2.15	2.15	1.95@ 2.35	Standard mine run	St. Louis	2.05	1.80	1.80	2.00@ 2.40
Pool 9 (Super. Low Vol.)	Baltimore	2.15	1.85	1.85	1.85@ 1.95	Standard screenings	St. Louis	.50	.80	.80	.75@ .90
Pool 10 (H.Gr. Low Vol.)	New York	2.05	1.90	1.90	1.80@ 2.00	West Ky. lump	Louisville	2.40	3.35	3.85	3.25@ 3.60
Pool 10 (H.Gr. Low Vol.)	Philadelphia	2.00	1.75	1.75	1.65@ 1.90	West Ky. mine run	Louisville	1.65	1.70	1.70	1.50@ 1.90
Pool 10 (H.Gr. Low Vol.)	Baltimore	2.10	1.65	1.65	1.65@ 1.75	West Ky. screenings	Louisville	.50	.80	.80	.60@ .80
Pool 11 (Low Vol.)	New York	1.85	1.60	1.60	1.50@ 1.75	West Ky. lump	Chicago	2.60	2.85	2.85	2.60@ 3.00
Pool 11 (Low Vol.)	Philadelphia	1.70	1.45	1.45	1.35@ 1.60	West Ky. mine run	Chicago	1.75	1.65	1.65	1.35@ 1.95
Pool 11 (Low Vol.)	Baltimore	1.90	1.55	1.55	1.55@ 1.65						
High-Volatile, Eastern					South and Southwest						
Pool 54-64 (Gas and St.)	New York	1.60	1.55	1.55	1.50@ 1.65	Big Seam lump	Birmingham	3.75	3.00	3.00	2.75@ 3.25
Pool 54-64 (Gas and St.)	Philadelphia	1.60	1.50	1.50	1.40@ 1.60	Big Seam mine run	Birmingham	1.95	1.60	1.60	1.50@ 1.75
Pool 54-64 (Gas and St.)	Baltimore	1.75	1.40	1.40	1.45@ 1.55	Big Seam (washed)	Birmingham	2.35	1.85	1.85	1.75@ 2.00
Pittsburgh ac'd gas	Pittsburgh	2.55	2.40	2.40	2.30@ 2.50	S. E. Ky. lump	Chicago	3.00	3.10	3.10	2.75@ 3.00
Pittsburgh gas mine run	Pittsburgh	2.25	2.10	2.10	2.00@ 2.25	S. E. Ky. mine run	Chicago	2.25	1.60	1.60	1.50@ 1.75
Pittsburgh mine run (St.)	Pittsburgh	1.85	1.85	1.85	1.75@ 2.00	S. E. Ky. lump	Louisville	3.00	3.10	3.60	3.25@ 3.60
Pittsburgh slack (Gas)	Pittsburgh	1.20	1.25	1.25	1.15@ 1.25	S. E. Ky. mine run	Louisville	1.75	1.60	1.55	1.50@ 1.75
Kanawha lump	Columbus	3.15	2.10	2.10	2.35@ 2.75	S. E. Ky. screenings	Louisville	.80	.90	.90	.85@ 1.05
Kanawha mine run	Columbus	1.85	1.40	1.40	1.35@ 1.65	S. E. Ky. lump	Cincinnati	3.55	2.75	3.35	3.00@ 3.75
Kanawha screenings	Columbus	.90	.95	.90	.90@ 1.10	S. E. Ky. mine run	Cincinnati	1.55	1.55	1.55	1.35@ 1.75
W. Va. lump	Cincinnati	3.50	2.60	3.25	2.75@ 3.60	S. E. Ky. screenings	Cincinnati	.90	1.00	1.00	.90@ 1.10
W. Va. gas mine run	Cincinnati	1.60	1.50	1.50	1.40@ 1.65	Kansas lump	Kansas City	5.00	5.00	5.00	5.00
W. Va. steam mine run	Cincinnati	1.60	1.40	1.40	1.25@ 1.50	Kansas mine run	Kansas City	3.50	3.25	3.25	3.50
W. Va. screenings	Cincinnati	1.00	.95	1.00	.90@ 1.00	Kansas screenings	Kansas City	2.25	2.35	2.35	2.00
Hooking lump	Columbus	3.05	2.50	2.50	2.40@ 2.70						
Hooking mine run	Columbus	1.85	1.60	1.60	1.50@ 1.65						
Hooking screenings	Columbus	.90	.95	.90	.80@ .90						
Pitts. No. 8 lump	Cleveland	2.60	2.35	2.35	2.00@ 2.80						
Pitts. No. 8 mine run	Cleveland	1.85	1.85	1.85	1.85@ 1.90						
Pitts. No. 8 screenings	Cleveland	1.00	1.15	1.05	1.00@ 1.15						

## South and Southwest

Big Seam lump	Birmingham	3.75	3.00	3.00	2.75@ 3.25
Big Seam mine run	Birmingham	1.95	1.60	1.60	1.50@ 1.75
Big Seam (washed)	Birmingham	2.35	1.85	1.85	1.75@ 2.00
S. E. Ky. lump	Chicago	3.00	3.10	3.10	2.75@ 3.00
S. E. Ky. mine run	Chicago	2.25	1.60	1.60	1.50@ 1.75
S. E. Ky. lump	Louisville	3.00	3.10	3.60	3.25@ 3.60
S. E. Ky. mine run	Louisville	1.75	1.60	1.55	1.50@ 1.75
S. E. Ky. screenings	Louisville	.80	.90	.90	.85@ 1.05
S. E. Ky. lump	Cincinnati	3.55	2.75	3.35	3.00@ 3.75
S. E. Ky. mine run	Cincinnati	1.55	1.55	1.55	1.35@ 1.75
S. E. Ky. screenings	Cincinnati	.90	1.00	1.00	.90@ 1.10
Kansas lump	Kansas City	5.00	5.00	5.00	5.00
Kansas mine run	Kansas City	3.50	3.25	3.25	3.50
Kansas screenings	Kansas City	2.25	2.35	2.35	2.00

\* Gross tons, f.o.b. vessel, Hampton Roads

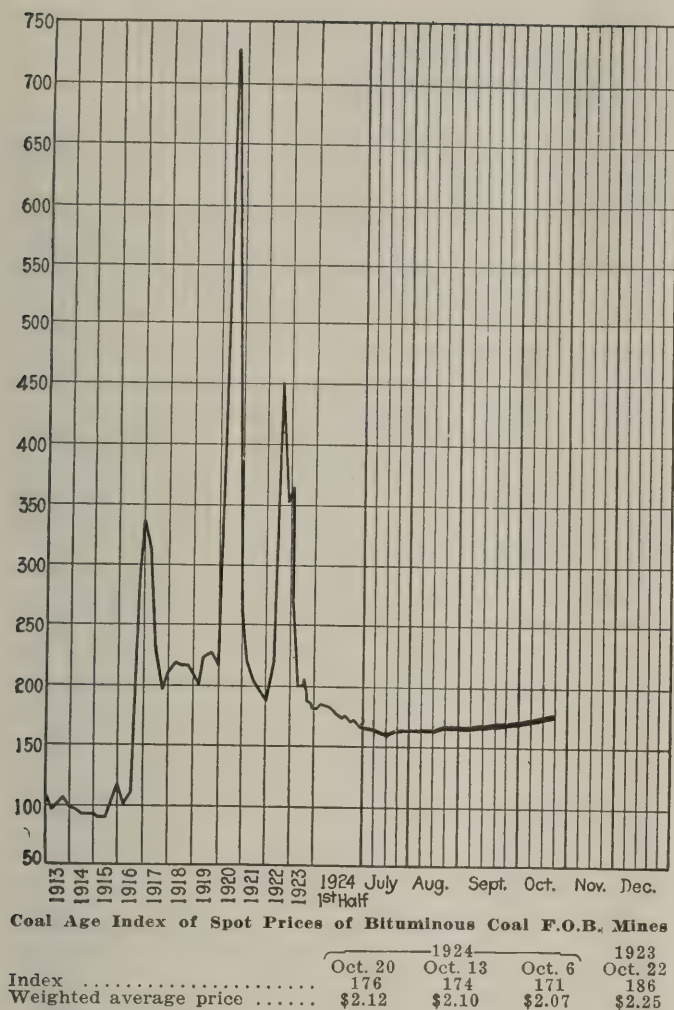
† Advances over previous week shown in heavy type, declines in italics.

## Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

Market		Freight Rates	Oct. 22, 1923		Oct. 13, 1924		Oct. 20, 1924†	
Quoted			Independent	Company	Independent	Company	Independent	Company
Broken	New York	\$2.34	\$9.60	\$8.00@ \$9.25		\$8.00@ \$9.25		\$8.00@ \$9.25
Broken	Philadelphia	2.39						
Egg	New York	2.34	9.85@ 12.25	8.75@ 9.25	9.25@ 9.75	8.75@ 9.25	9.25@ 9.75	8.75@ 9.25
Egg	Philadelphia	2.39	9.85@ 12.20	8.75@ 9.25	9.25@ 9.75	8.75@ 9.25	9.25@ 9.75	8.75@ 9.25
Egg	Chicago*	5.06	9.60@ 12.50	8.00@ 8.35	8.17@ 8.27	8.14@ 8.20	8.17@ 8.27	8.14@ 8.20
Stove	New York	2.34	9.85@ 12.25	8.75@ 9.25	10.00@ 10.50	8.75@ 9.50	10.00@ 10.50	8.75@ 9.50
Stove	Philadelphia	2.39	9.85@ 12.20	8.90@ 9.25	8.85@ 10.25	9.15@ 9.50	9.85@ 10.25	9.15@ 9.50
Stove	Chicago*	5.06	9.60@ 12.50	8.00@ 8.35	8.63@ 8.75	8.50@ 8.64	8.63@ 8.75	8.50@ 8.64
Chestnut	New York	2.34	9.85@ 12.25	8.75@ 9.25	9.50@ 10.00	8.75@ 9.25	9.50@ 10.00	8.75@ 9.25
Chestnut	Philadelphia	2.39	9.85@ 12.20	8.90@ 9.25	9.50@ 10.00	9.15@ 9.25	9.50@ 10.00	9.15@ 9.25
Chestnut	Chicago*	5.06	9.60@ 12.50	8.00@ 8.35	9.50@ 10.00	9.15@ 9.25	9.50@ 10.00	9.15@ 9.25
Pea	New York	2.22	6.75@ 8.25	6.15@ 6.65	8.26@ 8.40	8.44@ 8.60	8.26@ 8.40	8.44@ 8.60
Pea	Philadelphia	2.14	6.75@ 9.00	6.35@ 6.60	5.25@ 5.50	5.50@ 6.00	5.25@ 5.50	5.50@ 6.00
Pea	Chicago*	4.79	6.00@ 6.75	5.40@ 6.05	5.75@ 6.35	5.75@ 6.00	5.75@ 6.35	5.75@ 6.00
Buckwheat No. 1	New York	2.22	2.50@ 3.50	3.50	5.13@ 5.45	5.36@ 6.20	5.13@ 5.45	5.36@ 6.20
Buckwheat No. 1	Philadelphia	2.14	3.00@ 3.50	3.50	2.25@ 3.00	3.00@ 3.15	2.25@ 2.75	3.00@ 3.15
Rice	New York	2.22	1.85@ 2.50	2.50	2.50@ 3.00	3.00	2.50@ 3.00	3.00
Rice	Philadelphia	2.14	2.00@ 2.50	2.50	1.85@ 2.25	2.00@ 2.25	1.80@ 2.00	2.00@ 2.25
Barley	New York	2.22	1.15@ 1.50	1.50	2.00@ 2.25	2.25	2.00@ 2.25	2.25
Barley	Philadelphia	2.14	1.25@ 1.50	1.50	1.25@ 1.50	1.50	1.25@ 1.50	1.50
Birdseye	New York	2.22		1.60	1.35@ 1.60	1.60	1.35@ 1.60	1.60

\* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.





This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke; 1913-1918," published by the Geological Survey and the War Industries Board.

Mild weather has enabled St. Louis dealers to begin to get caught up. Business is good and coal is plentiful and nearly all dealers have a good supply on hand. Wagonload steam is picking up, but carload steam is still slow. Country domestic conditions show improvement for the better grades of coal, but country steam is slow with no change in prices. Domestic demand is principally for higher grade coal.

### Kentucky Prices Weaken

Prices quoted on all coals mined in Kentucky are weaker this week than last week, due to unusually fine October weather, low consumption, heavy production, lack of interest by consumers and the fact that operators tried to ride the market up too fast when demand was good and they were a bit oversold. The high prices put out on future delivery quotations killed demand, and when orders in hand were filled operators had to accept lower priced business in order to keep running.

In eastern Kentucky screenings have held quite well, in spite of heavy production, and prices are 85c. @ \$1.05, but with very little tonnage over 95c. In western Kentucky the market has broken, as Illinois, Indiana and other fields have been offering cheap screenings, and forced the market, until some western Kentucky distressed stuff is said to be quoted as low as 50c.

The eastern and western Kentucky markets are closer together on quotations than for a long time.

Eastern Kentucky is running well, with very little car shortage reported, and a number of mines that have been idle are on the producing lists. It is claimed that the Hazard field probably will break production records in October, and the Harlan district also is producing a fine volume.

### Northwest Trade Sags

Official reports of stocks on Duluth docks Oct. 1 as given by the U. S. Engineer's office show less coal than on Sept. 15. This is due to the fact that dealers are stocking up and also because anthracite has been moving to some extent. The soft is 4,656,000 tons, of which 2,100,000 is free, and the hard is 610,400 tons. Shipments, however, are picking up. Thirty-six cargoes arrived last week, of which four were hard coal, and fourteen are en route, of which three are hard.

The feature of the market at the Head-of-the-Lakes is the heavy demand for Pocahontas lump, which is now selling at \$8, with every possibility of another 50c. jump at the first of the month. There is no change in run of pile or screenings. The accumulation of Pocahontas screenings is getting beyond a joke. Prices are unchanged on all coals. Industrial demand is at a standstill. The iron ranges are practically closed down waiting for the election results.

Anthracite has slacked off in the past week, but the stocks on docks were reduced nearly 60,000 tons in the last fifteen days before the first of the month. There will be no shortage of hard coal at Duluth-Superior.

Mild autumn weather has made the coal trade of Milwaukee a waiting game. Consumers are holding back until lower temperatures compel them to fill their bins, and dealers are waiting for the consumers. The pressure for Pocahontas has eased somewhat because of the recent advance in the face of prevalent mildness. Coal continues to come in freely by lake. Thus far in October Milwaukee has received 50,807 tons of anthracite and 159,007 tons of bituminous coal.

### West Is Fairly Busy

Warm weather and less demand have enabled operators, some of them as much as a month behind on orders for domestic grades, to catch up with their orders. A further cut in the price of screenings in all the Southwestern fields has reduced the surplus of this grade. Kansas screenings dropped 35c. down to \$2, Arkansas screenings from the circular price of \$2 to \$1.50 and Henryetta (Okla.) screenings, which have been \$2, are now \$1.50 @ \$1.75. There have been no other price changes.

A more favorable week was experienced in Colorado last week due to the growing demand for domestic coals. Mines averaged thirty-one hours last week with less than 20 per cent of the working time lost attributed to "no market." A number of operators are booked ahead for thirty days.

In Utah intermediate sizes and slack are moving easier. Mining and smelting companies and the railroads are the best industrial customers now. Prices are more settled than for a long time. Even the expected advance in the retail market is not likely to materialize.

### Mild Weather "Settles" Ohio Markets

The Cincinnati market has "settled" a little in the past week, more through the effect of the weather than a stoppage of buying orders. There is still a cry of shortage of equipment from the southeastern Kentucky and West Virginia fields, due mostly to the fact that numerous mines which have not worked for weeks or months are starting up. The movement continues at the peak with occasional reports that dealers have suspended or cancelled orders, due to the fact that there has come quite a spread once more between the asked price and "spot" prices.

A marked slackening in domestic orders at Columbus, due to mild weather, has permitted producers and shippers to get cleaned up and the market is now in a waiting attitude. Prices on a retail basis are still strong at the higher levels which have prevailed. Smokeless grades and splints are still in a fair demand, but southern Ohio business has fallen off. The expected increase in steam business has failed to materialize and the trade is waiting to see what happens. Contracting is quiet, and cheap coals, mostly demurrage cargoes, are often sold at bargains. Screenings are still very weak. Lake trade is going along as usual for the lateness of the season.

Moderate temperatures in eastern Ohio have done considerable to dampen the steam as well as the domestic trade, which has been especially active. Steam buying is on a hand-to-mouth basis, and requirements are more or less at a minimum, because industrial operations have not gotten back to normal by any means. There is no change in spot prices, which are holding firm and are not expected to recede because producers are limiting operations to ship-



ments on coal already sold, and little distress coal is reported.

Big output, low prices made from beyond the Pennsylvania line and mild weather are conspiring to prolong the slack condition of the Buffalo market, which approaching winter is not able to counteract. It is time, by the calendar, for demand to rise rapidly and the smaller stocks from those of the early part of the year also warrant such a stir, but consumption does not seem to warrant it. Demand is quiet and prices are weak.

Owing to the prolonged spell of mild weather the demand at Toronto is rather slack with prices as follows: Pennsylvania smokeless, \$5.85; steam lump, \$6.25@ \$6.75; slack, \$5.70. Anthracite is \$15.50, and supplies are plentiful.

### Pittsburgh Has Competitive Market

The Pittsburgh market is in a highly competitive position with too much production, the buying having fallen off. Operation has been at a 50 per cent level since the middle of September. Domestic coal is moving in fair volume, at former prices. A number of producers are pursuing the policy of not soliciting business, hoping that thereby the market will work upward to a reasonable level.

### Demand Picking Up in New England

For really high-grade run of mine New River and Pocahontas \$5.50 gross ton on cars Boston is now the general asking price for prompt and nearby shipments; business was closed during the week for shipments a fortnight hence at \$5.65. Prices have strengthened noticeably in the Providence market, no first quality steam coal being offered now under \$5.40 on cars and \$5.50 being asked not infrequently.

Local shippers who purchased pool 1 run of mine New River and Pocahontas early in the week at \$4.35 gross ton f.o.b. Hampton Roads are now unable to obtain anything under \$4.40, and even at this offerings are light. For the choicer coals \$4.50 is firmly quoted. Tonnage purchased at the former level of prices for New England shipments is now well cleaned up and shippers here are forecasting \$6 coal in New England before the year is out.

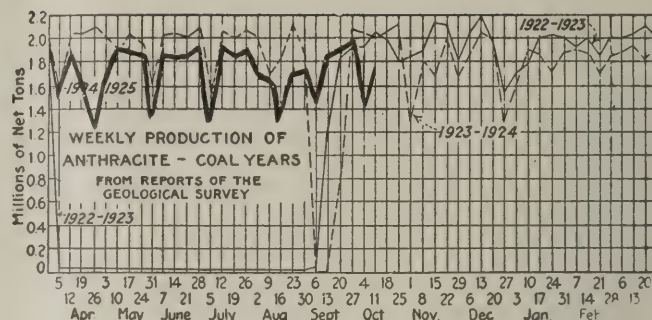
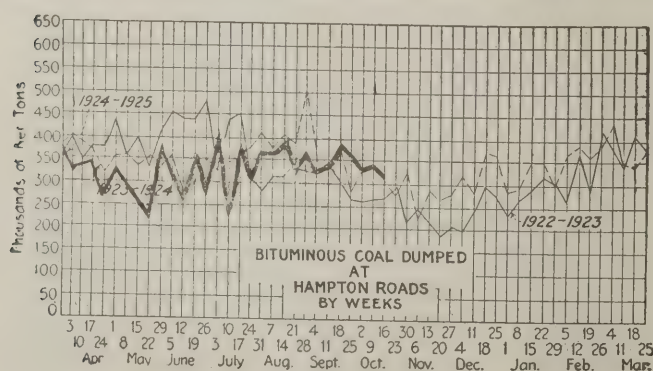
Demand is increasing considerably, particularly at Boston, and inquiries are becoming quite numerous. Both sales and inquiries involve some substantial blocks for spot, next sixty days and through to April 1. One sale of 10,000 tons of New River has been closed for shipments to April.

No worthwhile expansion is noted in all-rail coal but prices are a bit firmer, tonnage that has been offering at \$2 net ton mines being generally quoted \$2.10@ \$2.15, so the landed cost still favors coal from tide.

### Atlantic Markets Improve Slightly

No considerable improvement is reflected in the New York market nor can it be said that the situation is any quieter than it was last week. Line trade shows no increased activity, but the situation at tidewater has changed somewhat because of heavier shipments. Most of the coal sent here has been on contract and a little extra demand has practically cleared up the free coals. This has happened a few times recently, causing a slight price advance.

In the matter of tonnage the Philadelphia market is improving but prices continue on the old level. More coal is moving on contracts and prices for this business are considerably above spot quotations. Last week one of the utility plants in the city closed for 1,000,000 tons, divided among two producers. Everyone is hopeful that after election business will go forward much more rapidly. There



are very light holdings of coal at tide, and very few charters recorded recently.

The tide has turned at Baltimore in home trading for bituminous coal. There is no shortage of fuel, but purchasers are not quibbling when holders of better grade fuels ask 10c. to 20c. in advance of the recognized average prices of a few weeks ago. Despite the fact that the first 17 days of October have fallen behind the same period of September in coal exports there is an air of expectancy in shipping circles that is encouraging.

At Birmingham all grades of coal are suffering because of comparatively light demand. The weather is very dry and surplus domestic coal is moved with some difficulty. Prices are pretty well stabilized, with no likelihood of lower levels through the balance of the year. With the advent of cold weather both domestic and steam demand are expected to improve greatly. Production has risen materially.

### Anthracite Output Picks Up

From the viewpoint of the producer and shipper the anthracite market at New York is about all that could be expected so far as demand goes, but retail business is comparatively quiet. To induce buying while it is possible to get coal and avoid transportation troubles the aid of city officials has been solicited and appeals have been issued to consumers. Coal from the mines is easily moved. There is an urgent demand for stove with chestnut a close second. Egg is not so easily moved unless it is taken with stove, but it is not accumulating. Independent quotations for stove in straight lots are reported as high as \$11 but the average maximum is 50c. lower, and when taken with egg or chestnut sizes is quoted still lower. Pea is easy and in some instances hard to move alone. Demand for steam coals is steady, but prices, except for barley, are generally below company schedule.

Demand at Philadelphia is moderate because of the mild weather. Stove remains the only really active size, but chestnut is improving. Pea is moving slowly, even with curtailed production. There is only slight demand for egg, which seems to await colder weather. The retail trade is restive and the number of dealers cutting prices has increased. Steam coals are slow, and the only improvement is due to curtailed production. The mines are gradually resuming production after the flood, until at this time there are only a few that have not mined some coal.

At Baltimore the demand for hard coal continues to increase with the cooler weather. Most dealers have sufficient supplies on hand to meet this demand, except that some are short of stove coal. Many householders who have open fireplaces and who have been in the habit of burning logs until real cold weather sets in apparently intend to burn coal from the outset of cooler weather.

Trade at Buffalo is better than it was, but sunny weather has held back really brisk business. Sellers are somewhat uneasy, fearing car shortage and that supply will run below demand. The shippers who contracted to furnish the city schools most of their fuel in the form of Pennsylvania smokeless coal report that it is giving full satisfaction.

### Car Loadings, Surplusages and Shortages

	Cars Loaded	
	All Cars	Coal Cars
Week ended Oct. 4, 1924.....	1,077,006	186,516
Previous week.....	1,087,447	193,422
Week ended Oct. 6, 1923.....	1,079,690	191,741
	Surplus Cars	
	All Cars	Coal Cars
Oct. 7, 1924.....	103,730	52,643
Sept. 30, 1924.....	116,689	58,375
Oct. 7, 1923.....	34,138	7,098
		Car Shortage
		16,160
		4,600



## Foreign Market And Export News

### Foreign Demand Gains in British Market; Prices Fairly Steady

With the exception of semi-anthracite, the demand in the Welsh coal market shows scarcely any improvement. Foreign demand is somewhat better with French and Argentine railways inquiring for larger quantities. Foreign bunkering depots also are taking heavier supplies. Some collieries where stoppage notices expired are now continuing operations from day to day.

There is an abundance of coal on hand, but operators have declared that they have gone to the limit in price concessions; in these circumstances prices have remained fairly steady. The position in the European coal markets makes business with France very difficult, while there is no trade with Belgium, owing to the industrial situation in that country. There is an almost total absence of inquiry from Holland and Germany. The rise in freights to South America has been a setback.

Operators in the north of England also have refused to make any further concessions in prices, so that the Newcastle market is given an appearance of firmness. There is very little trade at all; pits are still closing down, and nearly all of the rest are operating on short time.

Output by British collieries during the week ended Oct. 4, a cable to *Coal Age* states, was 5,155,000 tons, according to the official reports. This compares with 5,208,000 tons produced during the previous week.

#### Business at Hampton Roads Develops Strong Tone

The Hampton Roads market was considerably stronger this week due to shortage at the piers and a strong demand for bunkers, together with a pick-up in coastwise trade. Foreign business has shrunk, with little in sight.

Domestic business is weaker, on account of unusually mild weather. High-

volatile coal is less in demand, and its price was not changed during the week, the other pools going up materially. Business in pools 1 and 2 was brisk and the piers were busy. Accumulations at tidewater were reduced materially through rail shipments to the west direct from mines, and stronger prices were more attributable to this than to any extra demand.

#### French Industrial and House Coals More Active

While the situation in the French coal market shows no general improvement, orders for industrial coals have been coming in steadily since prices for October were established. The railways show hesitancy in buying French coals, the prices of which are considered too high in comparison with those of Germany and the United Kingdom. Demand is generally weak, with stocks about normal.

For house coals the demand is more active, but shipments are delayed through the rolling stock position. Deliveries of house coal from Belgium are slow, apparently having been reduced for the purpose of selling at higher rates when opportunity presents itself. Arrivals from Germany on the open market are not important.

Rail traffic is somewhat congested, especially on the State Railway lines; canal freight is quiet but steady at 23f. Béthune-Paris; 9-9. 25f. Rouen-Paris.

Reparation deliveries from Sept. 1 to 29 amounted to 895,765 tons of fuels, including 432,472 tons of coal, 423,030 tons of coke and 36,263 tons of lignite briquets; or a daily average of 30,700 tons.

On Oct. 1 the prices of industrial fuels on trucks French frontier, trucks or canal barges, French ports of the Rhine, were lowered by 2.50f. per ton. House coal and lignite briquets are

unchanged. Prices for oversea cargoes, via Rotterdam, Antwerp or Ghent, for French Channel, Atlantic or Mediterranean ports have been reduced 5f. per ton for unscreened 18-26 per cent volatile matter and washed steam peas. On trucks or canal barges, Antwerp or Ghent, prices are unaltered.

From Oct. 1 to 8, the O.R.C.A. received 77,693 tons of coke, a daily average of 9,700 tons. The price of reparation coke, unaltered thus far, probably will be changed soon.

The position of the Belgian coal market is critical and there are bitter complaints of severe competition. Boring mine owners having refused to arbitrate, the strike continues and is even growing worse.

#### Export Clearances, Week Ended Oct. 18, 1924

##### FROM HAMPTON ROADS

For Canada:	Tons
Br. Schr. Burpee L. Tucker for St. John	743
Fr. Str. Emilie L. D. for Montreal	6,533
Dan. Str. Nordhavet for St. John	5,018
For Canal Zone:	
Amer. Str. Ulysses, for Cristobal	12,059
For West Indies:	
Fr. Str. Caid, for St. Pierre	1,173

##### FROM PHILADELPHIA

For Newfoundland:	
Nor. Str. Evviva for St. Johns	—

##### FROM BALTIMORE

For Canada:	
Nor. Str. Otta, for Corner Brook	4,592
For France:	
Belg. Str. Elzasier, for Dunkirk	7,538
For Chile:	
Br. Str. Denham, for Antofagasta (coke)	3,482

#### Hampton Roads Pier Situation

N. & W. Piers, Lamberts Pt.:	Oct. 9	Oct. 16
Cars on hand	1,128	825
Tons on hand	71,373	53,728
Tons dumped for week	115,089	111,860
Tonnage waiting	6,000	5,000
Virginian Piers, Sewalls Pt.:		
Cars on hand	1,210	1,118
Tons on hand	83,650	80,000
Tons dumped for week	106,433	105,729
Tonnage waiting	6,666	7,800
C. & O. Piers, Newport News:		
Cars on hand	1,176	1,596
Tons on hand	59,725	84,060
Tons dumped for week	82,449	74,486
Tonnage waiting	510	3,760

#### Pier and Bunker Prices, Gross Tons

	PIERS	
	Oct. 11	Oct. 18†
Pool 9, New York	\$4.75@ \$5.05	\$4.80@ \$5.10
Pool 10, New York	4.60@ 4.75	4.65@ 4.80
Pool 11, New York	4.35@ 4.50	4.35@ 4.50
Pool 9, Philadelphia	4.90@ 5.25	4.90@ 5.25
Pool 10, Philadelphia	4.45@ 4.70	4.45@ 4.70
Pool 11, Philadelphia	4.30@ 4.50	4.30@ 4.50
Pool 1, Hamp. Roads	4.25	4.40@ 4.50
Pool 2, Hamp. Roads	4.10@ 4.15	4.20@ 4.30
Pools 5-6-7 Hamp. Rds.	4.00@ 4.10	4.00@ 4.10

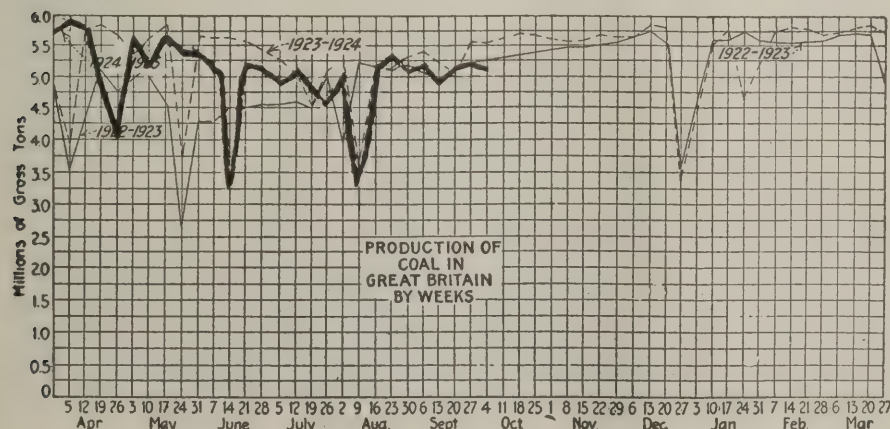
	BUNKERS	
	Oct. 11	Oct. 18†
Pool 9, New York	\$5.00@ \$5.30	\$5.05@ \$5.35
Pool 10, New York	4.85@ 5.00	4.90@ 5.05
Pool 11, New York	4.60@ 4.75	4.60@ 4.75
Pool 9, Philadelphia	4.90@ 5.25	4.90@ 5.25
Pool 10, Philadelphia	4.75@ 4.95	4.75@ 4.95
Pool 11, Philadelphia	4.50@ 4.70	4.50@ 4.70
Pool 1, Hamp. Roads	4.25	4.50
Pool 2, Hamp. Roads	4.10@ 4.15	4.30
Pools 5-6-7 Hamp. Rds.	4.00@ 4.10	4.10

#### Current Quotations British Coal f.o.b. Port, Gross Tons

##### Quotations by Cable to Coal Age

Cardiff:	Oct. 11	Oct. 18†
Admiralty, large	27s. @ 27s. 6d.	27s.
Steam smalls	10s. @ 15s.	11s. 6d. @ 15s. 6d.
Newcastle:		
Best steams	17s. 9d. @ 18s. 6d.	17s. 6d. @ 18s.
Best gas	21s. @ 22s. 6d.	22s. 6d. @ 26s. 9d.
Best bunkers	17s. 6d. @ 18s. 6d.	17s. 6d. @ 18s. 6d.

†Advances over previous week shown in heavy type, declines in italics.







## News Items From Field and Trade



### ALABAMA

The Munro-Warrior Coal Co. is considering the erection of a new tippie at its Nauvoo No. 2 mine, Walker County, and it is understood that plans for the structure are now being drawn. These mines are now operating on practically full time.

W. L. Smith and associates of Gadsden, are opening coal mines at Altoona which may soon be producing from 400 to 500 tons daily. They will turn out 200 tons at the start, it is stated, and the coal is of high quality. A tippie 65 ft. high is being completed and a spur track on the top of the mountain runs back to the opening, a distance of 2,300 ft. A new system of mining is being employed, which it is asserted will reduce the cost. The Underwood seam on the property is 4 ft. 6 in. thick. The Blue Gem seam also is to be worked.

Charles F. DeBardeleben, Jr., has been appointed general manager of the Alabama Fuel Co., with supervision over all properties, according to a recent announcement. Mr. DeBardeleben probably is the youngest man in the state to be given such a responsible position. His father is president of the company, which includes some of the largest and most active coal operations in the state. The new general manager, after coming from school, was sent to the Overton mine, where he was employed, and was later made superintendent of that plant.

Officials of the Sloss-Sheffield Steel & Iron Co. have practically completed negotiations for the purchase of the properties of the Alabama Company. The deal will give the Sloss-Sheffield company four furnaces in Etowah County and coal properties in Tuscaloosa County. Besides it will get possession of the Mary Lee mine near Birmingham, and of a small railroad which will enable the Sloss company to make connections between its furnaces and its coal mines. Use of this road is expected to save Sloss a substantial sum in freight charges annually. The price, including certain obligations to be assumed by the Sloss company, is approximately \$4,000,000. There will be no public financing.

### COLORADO

Ralph F. McKinley and Charles H. Cox, experienced in the Canon City and Crested Butte regions, have taken over the Butcherknife mine, 14 miles west of Steamboat Springs and expect to build a 2-mile branch from the Moffatt road to the mine. C. O. Rudisill, who has been operating the mine, has gone

into the feed and fuel business in Steamboat Springs.

### ILLINOIS

George A. Miller, who was Western manager of sales for the Sheridan Wyoming Coal Co., under Peabody Coal Co. management has been made general sales agent of the Peabody company with an office at the company's headquarters in Chicago. The contract for selling the Sheridan Wyoming Coal Co.'s output terminated Oct. 1.

Peabody, Houghteling & Co. are offering \$2,250,000, 7 per cent cumulative preferred stock of the Peabody Coal Co., of Chicago. This stock, part of an issue of \$4,425,000 already outstanding, was acquired by Peabody, Houghteling & Co. from certain of the stockholders at private sale and is offered at 100 and accrued dividend, to yield 7 per cent.

J. H. Evans, of St. Louis, has joined the clerical forces of the Old Ben Coal Corporation at Mine No. 12, near Christopher.

George Duncan, of Alton, was made permanent receiver for the St. Louis Coke & Iron Co., of Granite City, recently when the case was called for hearing before U. S. Judge Louis Fitzhenry at Springfield. Duncan was made temporary receiver a few weeks ago when a petition in bankruptcy was filed.

The Valier Coal Co., at Valier, broke its hoisting record recently by hoisting 7,072 tons of coal in eight hours. The output filled 125 railroad cars. The mine on that day averaged 1,000 tons per hour actual hoisting time.

Mine No. 5, at Pinckneyville, is the first Southern Gem Coal Corporation property to start operations since the general shutdown of the bankrupt company's mines late last December. The mine worked 5 days last week and prospects are good during the coming months for steady operation. While a full crew is not being employed, the larger portion of the former miners employed at the plant are again working.

### KENTUCKY

The East Kentucky Coal Co., of Hazard, has increased its capital stock from \$50,000 to \$100,000.

It is reported that coal operators and shippers of the Kentucky district are generally opposing the Howell-Barkley transportation bill, up before the last Congress and to come up again soon, and a number of large organizations have adopted resolutions con-

demning this bill, and also the proposed twentieth amendment to the Constitution, which would prohibit any work, even home work or farm work, for any boy or girl under 18 years of age. The latter bill would aid union labor alone and be of no advantage except to aid union labor in getting a higher wage scale and work a hardship on parents.

T. L. Bell has been appointed general superintendent of the Kentucky mining operations of the Munro-Warrior Coal & Coke Co., with headquarters at Nortonville. Mr. Bell was formerly attached to the engineering department of the Tennessee Coal, Iron & Railroad Co.

An involuntary petition in bankruptcy was filed in the U. S. District Court at Covington Oct. 11 by the Mahan Co., the Powell-Hackney Co. and the Hazard Fruit Co. against the Blackey Coal Co. of Blackey, seeking to have the defendant company declared bankrupt. The creditors' claims aggregate \$5,571.69.

R. C. Tway, head of the R. C. Tway Coal Co., Louisville, with mines in eastern Kentucky and retail yards in Louisville, has purchased at a reported price of \$60,000, 100 ft. of Broadway property, in Louisville, for enlargement of the coal and building supply business now on adjoining property.

There were fifty causes for the 11,572 accidents in Kentucky's greatest industry, coal mining, from Aug. 1, 1923, to Aug. 1, 1924. Falling objects netted 4,034 mishaps. Being caught between objects caused 3,325. Falls of coal, slate and shale caused 1,974. Other causes, bringing the total accidents to 11,572 were: Emery particles, dust 538; handling heavy objects, 338; sharp edges, 292; miscellaneous or unclassified, 135; coupling cars, 121; slipping, 120; hot metals, 83; nails stepped on, dump and pit cars, 76; hit by vehicles, cars, etc., 63; motor or hand cars, 56; electricity, 54; falls from wagons, cars, etc., 32; hit by machine parts, 31; powder and dynamite explosions, 27; hit by hoisted objects, 27; animal kicks, bites, 23; stumbling, 15; collision of cars, 15; hot substances, 13; hit by chips, etc., 22; hand tools, 10.

### NEW YORK

Justice Nichols of the New York Supreme Court has signed an order permanently restraining operations of the Cranston Coal Mining Corporation in New York State. Amos D. Moscrip, Deputy Attorney General, told the court that the firm's operations had cost residents of Wayne, Monroe and Genesee counties more than \$100,000 when they



answered advertisements and purchased stock in the corporation to obtain coal from "their own mines." Purchasers were taken to the mining district near Carbondale, Pa., and coal mines represented as belonging to the company were shown to them. Investigation showed, Mr. Moscrip testified, that no coal had been produced in Pennsylvania by the firm. Officers of the corporation were named as Robert McLaughlin of New York, president; William M. Day, of Norfolk, Va., vice-president, and E. M. Saunders, of Philadelphia, secretary and treasurer.

## OHIO

The Combined Coal Co., capitalized at \$42,000 has been organized at Crooksville by sixteen miners. They have taken over the Cres Mar Coal Co.'s holdings, and plan to supply domestic coal and also to ship a portion of their product. George Appleman is president; Harvey Smith, vice-president and Fred Reed, secretary-treasurer.

## PENNSYLVANIA

Business in the Connellsville coke region continues to increase gradually. At the Orient plant the Hillman Coal & Coke Co. is firing 180 ovens and the Oliver & Snyder Steel Co. is increasing coking operations.

The Buckeye Coal Co., Brownsville, Pa., a subsidiary of the Youngstown Sheet & Tube Co., expect to finish the installation of the skip hoist at the Nemacon mine in Greene County, about Jan. 1, after which daily output will be increased from 3,000 tons, as at present, to 5,000 tons.

After being in operation for 81 years the Coleraine mine, near Hazleton, has been closed down permanently. In its 81 years of operation the mine has had three different owners.

"Work at the Face" meetings, which are a form of educational and entertainment gatherings of mine workers and superintendents, were conducted last week by the Olyphant and Eddy Creek collieries of the Hudson Coal Co. in Olyphant. L. F. Weichel, new superintendent of collieries, addressed the meetings.

The Haddock Mining Co., aside from striking valuable and extensive virgin coal deposits in the vicinity of Silver Brook, where it recently acquired new

holdings, has struck some extensive veins of which nothing had been known in that section. It is thought that these are extensions of the different veins, the Mammoth included, from the Mahonoy Valley coal basin.

Boyd C. Osler, mining engineer for the Hazle Brook Coal Co., in Hazleton, has resigned to become chief engineer and general superintendent for the Shamokin Coal Co., a concern that was recently organized for the purpose of reopening the old Neilson mine, in the Shamokin field. At one time Mr. Osler was in the employ of the Susquehanna Coal Co.

A mine abandoned by the Lehigh Valley Coal Co. located in Pottsville more than 25 years ago is to be reopened at once by Scranton and Wilkes-Barre capitalists. At the time of the abandonment of the mine, known as York Farm colliery, Lehigh Valley officials predicted that it would be reopened. Some of the coal will be taken from under the Schuylkill County court house, where veins lie so close to the surface that coal is struck in digging cellars.

There has been so much idleness among miners in the Phillipsburg region of central Pennsylvania due to the operators being unable to compete with other fields that the children of miners have been obliged to remain out of school through lack of proper clothing and sufficient food. People of the town recently contributed to a fund to purchase clothing for the children.

Representatives of many anthracite companies recently were the guests in Hazleton of the Bucyrus Steam Shovel Co., of Bucyrus, Ohio, to inspect the first power shovel over the 80-ton limit used in the anthracite field and the operation of equipment by electricity, with standard gage locomotives and cars on standard gage tracks at the Cranberry Creek Coal Co. stripping operation. The 380-ton shovel used in the stripping operation is the largest in the anthracite region. Following the demonstrations the company was host at a dinner at the Altamont Hotel in the evening.

Sixty-nine of the 168 fatalities during September in the industries of Pennsylvania occurred in the coal mines. Thirty-eight of these deaths were in the anthracite and 31 in the bituminous mining districts. In industrial and manufacturing plants 65

fatalities happened during September while in the public utilities there were 34 deaths. The mine fatalities were divided as follows: Anthracite—Lackawanna, 8; Luzerne, 18; Northumberland, 4; Schuylkill, 8. Bituminous—Allegheny, 1; Armstrong, 1; Butler, 1; Cambria, 4; Clearfield, 1; Fayette, 7; Greene, 1; Indiana, 5; Somerset, 2; Washington, 3, and Westmoreland, 5.

Harrison D. Mason, Jr., formerly secretary and member of the firm with the Mine Safety Appliances Co., Pittsburgh, is now chief engineer with the Commercial Coal Mining Co. at Ebensburg. "Joe" Mason, as he is very generally known among his friends, is well known to the coal mining fraternity through his five years' service with the U. S. Bureau of Mines, as safety engineer attending some 38 mine explosions and fires, also through his service as secretary-treasurer for the Coal Mining Institute of America.

The present officers of District No. 2, United Mine Workers, which includes the central Pennsylvania bituminous field, will all have opposition at the election which will be held in December. District President John Brophy will be opposed by George Bassett, of South Fork, while Vice-President James Mark will be opposed by Jerre Ford, of Patton. John Ghizzoni, of Washaw, is having opposition in the person of Evan Thomas, of Barnsboro, for member of the International executive board. Richard Gilbert, the present secretary-treasurer, will have no opposition. Practically all the members of the district board and the organizers have opposition for reelection.

Three masked bandits, heavily armed and with a high powered automobile waiting to carry off the loot, held up a train crew and three guards early Saturday morning, Oct. 11, and carried off a safe containing \$33,000 in cash belonging to the Ebensburg Coal Co., intended to pay miners at the coal company's operations at Colver, Cambria County. James Garman, aged 65, employed as a guard by the coal company, was shot when he grappled with the bandits.

The Koontz Coal Co., of Frostburg, Md., announces the purchase of the Pine Hill Mine, in Somerset County, formerly operated by C. J. Rowe & Co., which went into the hands of receivers. Pine Hill is one of the oldest workings in the Somerset field and for many years produced a large tonnage. The Koontz Coal Co. was recently organized by William and James Jenkins, of Frostburg, and Jonathan Jenkins, of Baltimore.

Officials of the Cranberry Creek Coal Co. in the Hazleton field of the anthracite region are having a permanent flume constructed to carry the flow of mine water past a mine opening. It is of large capacity and will afford protection there against conditions which arose several weeks ago when a rain-storm swept the anthracite section, causing heavy damage to various operations. Cypress is being used and the wood is grooved to provide for any expansion. The side supports for the flume are now in place and the bottom



### Mabscott Team

This group scored a perfect record and won \$60 and the company cup in the New River Co.'s fifth annual first-aid contest recently at Mt. Hope, W. Va.



boarding also installed. The job is being watched with unusual interest by coal company officials generally.

## TEXAS

The Texas Gulf Sulphur Co., of New York City, is reported to have acquired 1,400 acres of lignite land in Milam County, Texas, and will develop same.

## VIRGINIA

J. H. Franks, of Toms Creek, has resigned his post as assistant superintendent and general mine foreman of the Virginia Iron, Coal & Coke Co., to accept a better position with the Fordson Coal Co.

## WYOMING

Production in the Rock Springs district is steadily improving. Most of the mines, with the exception of some of the smaller commercial producers, are working five days a week. On Oct. 2 the peak for the fall was reached, when approximately 15,000 tons was shipped.

Only two more bodies remained in the Sublet No. 5 mine of the Kemmerer Coal Company, on Oct. 8, four bodies having been recovered the day previous. These were found beneath bad cave-ins on the slopes. Thirty-nine men lost their lives in this mine on Sept. 16 in an explosion which badly wrecked the mine.

Eugene McAuliffe, president of the Union Pacific Coal Co., has offered the churches of Rock Springs full co-operation in obtaining church services for the outlying camps of the Rock Springs district. The ministers of that city are working out a schedule. It is thought that each denomination will name a Sunday night during the month when services will be held in a specified camp by its minister. Some churches also are preparing social service programs, chief of which is the Methodist, Rev. Roy E. Burt, pastor, who is planning week-day religious groups and boys' and girls' activity clubs for all camps.

Life checks are now in use in all of the mines of the Union Pacific Coal Co. at Rock Springs, Cumberland, Hanna, Winton, Superior and Reliance, it has been announced from the company headquarters at Rock Springs. Every person who enters a mine of this company, whether miner, official or visitor, receives a brass check bearing a number, and the name of the person together with the number is listed on the company books until the bearer has returned the check.

## CANADA

The congratulations of many friends are being extended to Gordon B. Mackie, of the Penn Canadian Fuel Co., Toronto, on his recent marriage at Stroud, Ont., to Miss Lucy McWaters, of that place.

Following a series of conferences held by Roy M. Wobvin, president of the British Empire Steel Corporation, and the steel and coal managers, H. J. McCann, general manager of the Dominion Coal Co., stated that conditions

at present do not warrant the expectation that more than two Cape Breton mines will be kept in operation during December and January. However, if efforts now being made to obtain a Canadian National Railways contract prove successful, the steel plant will re-open before the end of the year. Should this be the case there should be an average amount of employment at the mines in the early winter. The management of the coal company insists that it cannot find a market for its coal and is therefore compelled to suspend operations in the majority of its pits. Not having any funds in the exchequer it is stated that coal will not be banked during the coming winter.

Among the questions to be decided during the western visit of Charles Stewart, Dominion Minister of Mines, is the fate of the lignite briquet plant at Bienfait, Sask., in which the governments of Saskatchewan, Manitoba and Canada spent many thousands of dollars.

A new colliery is announced for the Nicola-Princeton district in the Tulameen Valley Coal Mines. This company is developing what is reported to be a promising field and is likely to be shipping this winter.

Wm. Roper has retired from the management of the East Wellington Coal Co. and has been succeeded by William Wilson, formerly overman at No. 1 Mine, Extension, B. C.

George S. Rice, of the U. S. Bureau of Mines, recently visited the Springhill collieries and the submarine mines in Cape Breton of the British Empire Steel Corporation. At the request of the company he made an inspection of the method of mining in the Allan shafts, with a view to offering some helpful suggestions for improvements.

William Sherman, president of District 18, United Mine Workers, announces that the striking miners of Alberta have ratified the new working agreement, submitted to them for a referendum vote.

On Sept. 30 the output of the collieries of the Dominion Coal Co., a subsidiary of the British Empire Steel Corporation, was 18,018 tons, the largest for a single day in nine years. The total output of coal for September was 273,374 tons, an increase over August of about 40,000 tons but slightly less than the output for September, 1923.

The plant and land at Port Stanley, Ont., of the Nukol Co., which has been in the hands of a receiver for some time, have been sold to two Toronto firms for \$2,500. The company purchased the plant for \$5,000 and in addition to installing much costly machinery, renovated it extensively. The value of the machinery alone, which is to be shipped to Toronto, is between \$15,000 and \$20,000.

Norman Harvey, formerly Deputy Minister of Railways for the Province of Alberta, is making a survey of the coal resources of western Canada with a view to making a report to the Vancouver Harbor Commissioner. The purpose of the latter is to ascertain the prospects of building up a greater coal

bunker trade through the port of Vancouver. Mr. Harvey recently was in consultation with Howard Stutchbury, trade commissioner, and coal operators of Alberta. Mr. Harvey is classifying the coals of the two provinces and estimating the present and future requirements for marine bunkering at the Pacific coast. He also will report on the development of coastwise and trans-Pacific business both in marine and domestic coals.

An order made at Osgood Hall, in Toronto, last week directs the winding up of the Rocky Mountain Collieries on the petition of the Brazeau Colliers, Ltd., creditors to the extent of \$289,849. The Rocky Mountain Collieries were incorporated in 1909 with a capital of \$1,000,000, to take over certain coal locations owned by the German Development Co. Sir William Mackenzie, it is stated, promoted the incorporation, being desirous of obtaining a half interest in the properties. The provisional directors, G. A. Ruel, A. J. Reid and A. J. Mitchell, disclaim any interest in the company and referred the petitioner to Mackenzie, Mann & Co., whom they represented.

## New Companies

**Northwest Coal & Iron Co., Ltd.**, has been incorporated to produce and deal in ores, metals and minerals, with head office at Toronto and a capital of \$1,000,000, by Julia J. Butterfield, Alan G. McDougall, Frederick H. Honeywell and others.

**The Ute Coal Co.** has been incorporated in Axial, Colo., by L. H. Pattison, R. W. Kilmer and S. G. Lehr.

**The Bear River Collieries Co.** has been incorporated in Denver, Colo., with a capital of \$1,000,000, by J. L. Jones, G. E. Fraker and W. Glauster.

**The Beach Fork Blue Gem Coal Co.** has been incorporated in Tazewell, Tenn., by G. M. Montgomery, John T. Rogers and M. R. Carr.

Among recently filed charters in Kentucky were the following: **Elliott & Day Coal Co.**, Pikeville, capital \$10,000. W. K. Elliott, P. W. Day and T. L. Day. **Gregory Branch Coal Co.**, Grays, \$50,000. J. T. Gray, Matyle Gray and H. E. Hubbard. **Dozier-Diamond Coal Corporation**, Madisonville, \$20,000; W. B. Dozier, Jesse Dimond and E. W. Dozier.

**The Citizens Coal Co.**, with a capital of \$22,000, has been formed by Isaac Jones, Thomas C. Walton, John C. Howell and others at Higbee, Mo., to own and operate a coal mine.

**The Canon United Coal Co.** has been incorporated in Canon City, Colo., with a capital stock of \$20,000 and 10,000 shares of no par value, by W. E. Prall, M. Lewis and C. Linkins.

**The Jericho Coal Co.** has been incorporated in Owensboro, Ky., with a capital stock of \$50,000, by W. Minter, 1751 Linden Street, Memphis, Tenn., B. D. Williams, Jr., and Dolph Woodruff both of Mannington, Ky.

**The W. D. Lacy Coal Co.** has been incorporated, with a capital stock of \$10,000, in Waco, Tex., by W. D. Lacy, F. L. Miller, 1211 Washington avenue, and others.

**The American Steel & Wire Co.**, a subsidiary of the United States Steel Corporation, has acquired the plants and other assets of the Cyclone Fence Co. The latter company is capitalized at \$1,500,000 and has plants at Cleveland, Waukegan, Fort Worth and Newark.

**The Piedmont Coal Co.**, of Dora, Ala., has been incorporated with a capital stock of \$18,000, all paid in. The incorporators are Mrs. C. S. Ramsay, of Birmingham, and W. W. and J. H. Bankhead, of Jasper, Ala. They will conduct a general coal-mining business.



## Traffic

### Approves Cancellation of Rates By Lehigh Valley

The Public Service Commission of New York has approved cancellation by the Lehigh Valley R.R. of commodity rates on coal (anthracite screenings and pea and buckwheat screened from prepared sizes), carloads, from Tift Farm (Buffalo) to Buffalo, Caledonia, Cheektowaga, East Buffalo, Niagara Falls and Suspension Bridge, effective Nov. 2, 1924, leaving no rates in effect for such service. Sup. No. 1 to P. S. C. No. A-289.

The commission has also approved the cancellation by the Lehigh Valley R.R. of tariff providing handling charges on anthracite coal screenings (including pea and buckwheat) made in dumping coal into vessels at Tift Farm (Buffalo) and North Fair Haven, viz.: picking up and loading into cars for reshipment over trestle or for rail movement; effective Nov. 2, 1924, leaving no rates in effect for such service. Sup. No. 1 to P. S. C. No. A-300.

### Hearing Announced on Change In Ohio Switching Rate

The Coal, Coke and Iron Ore Committee, Central Freight Association Territory, will hold a hearing in Room 606 Chamber of Commerce Building, Pittsburgh, Pa., Thursday, Oct. 30, 1924, at 10 a.m., Eastern standard time, on a contemplated change in the switching rates on coal, coal boulets and briquets, coke (except petroleum coke), coke breeze, coke dust and coke screenings, carloads, as shown in B. & O., C. & C. Series, I.C.C. 2,429, from the point of connection of the Baltimore & Ohio R.R. with the Pennsylvania R.R. at Martins Ferry, Ohio, to private sidings on the B. & O. within the switching limits of Martins Ferry, Ohio. It is proposed to cancel the switching rate of 13c. per net ton, minimum \$3.60 per car, and apply a rate of 76c. per net ton, as per Agent Davis' Tariff I.C.C. 43, and B. & O. Tariff I.C.C. 2,306.

### Hearing Set on Application for Through Rates from Colorado

Examiner Keeler of the Interstate Commerce Commission will hold a hearing at Topeka, Kan., Nov. 7, on the application of the Kansas Public Utilities Commission for a through rate on coal moving from Colorado to points on the Frisco and Katy.

"At present, points on these lines are paying a combination of local and through rates," A. M. Corp, rate expert for the Utilities Commission, explained. "A through rate to these cities would result in a considerable decrease. We desire to put into effect joint through rates and divisions on coal from Colorado in place of the present schedule, which is a combination of locals over the junction points."

The Santa Fe, Union Pacific, Missouri Pacific, and the Rock Island are the defendants in this action. All

these lines bring coal from Colorado. The Frisco and Katy do not run into Colorado.

### Protest by Burns Bros. Against Hard-Coal Rates Dismissed

Freight rates on anthracite, in carloads, from the Shamokin district of Pennsylvania to Elmira, N. Y., are not unreasonable, the Interstate Commerce Commission has ruled. It also finds no irregularity in the failure of the Lehigh Valley to absorb switching charges at Elmira. Therefore the commission has dismissed the complaint of Burns Bros., of New York, contending that charges for the detention of interstate shipments of coal, in cars constructively placed short of destination, are unreasonable.

### Enjoins Raise in Switching Rate

The Colorado State Public Utilities Commission on Oct. 10 forbade the Colorado & Southern R.R. to make any increase in the freight switching charges in Denver for a period of 120 days. The railroad recently filed a notice that it intended making an increase of 33½ per cent. The Victor-American Fuel Co. protested.

## Association Activities

After a useful existence of eight years, the Southern Ohio Coal Exchange, which had headquarters in Columbus, passed out of existence last week. The association was composed of operators in the southern Ohio field, including the Hocking Valley proper and Pomeroy. W. D. McKinney was its secretary and active head while James H. Pritchard was mining commissioner. The association sprang into existence in 1916, when it was believed that a closer association of producers in the southern Ohio field was necessary and Mr. McKinney was called to be its first secretary. He waged many successful fights for the rights of the operators of that field, including several successful freight rate controversies before the Interstate Commission and the Ohio Utilities Commission. Lack of funds caused by bad business in the field is the cause for the demise. Steps may be taken later on to revive the organization or to get operators in that field together for mutual benefit.

## Obituary

William P. Porter, aged 57, a retired coal operator of Vinton County, Ohio, died suddenly while at a gasoline filling station from heart trouble. He resided in Columbus for the past seven years and was prominent in Masonic circles. He leaves two sisters and a brother.

## Coming Meetings

**Illinois Mining Institute.** Annual meeting, Nov. 22, Elks Building, Springfield, Ill. Secretary, Martin Bolt, Springfield, Ill.

**American Society of Mechanical Engineers.** Annual meeting, Dec. 1-4, Engineering Societies Building, 29 West 39th St., New York City. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

**West Virginia Coal Mining Institute.** Annual meeting, Dec. 2-3, Welch, W. Va. Secretary, R. E. Sherwood, Charleston, W. Va.

**Coal Mining Institute of America.** Annual meeting, Dec. 3-5, Chamber of Commerce Bldg., Pittsburgh, Pa. Secretary, H. D. Mason, Jr., Box 604, Ebensburg, Pa.

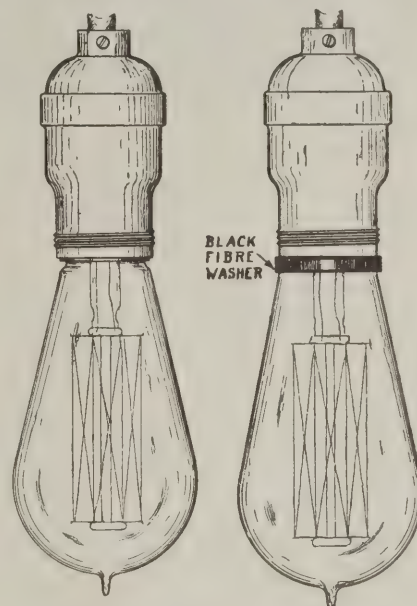
**West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers.** Fourth annual convention, Dec. 12 and 13, Huntington, W. Va. Secretary-Treasurer, Herbert Smith, Huntington, W. Va.

## New Equipment

### Lock for Electric-Light Bulbs

A simple and effective lock to prevent the theft of electric light bulbs recently was placed on the market by the Ren Manufacturing Co., Lyseum Building, Winchester, Mass.

This device, called the Ren-Lock, con-



Unlocked and Locked Lamp

The small size of the locking device permits its use on any brass socket regardless of the type of reflector used with the lamp. This feature is important if the light center is to be maintained.

sists of a coiled spring and a grooved ring. A special device is used to attach the lock to the socket.

When a lamp is locked in place by means of this device it cannot be re-



Spring and Washer

These are the only two parts of the locking device. The coiled spring has a projecting end which locks the lamp.

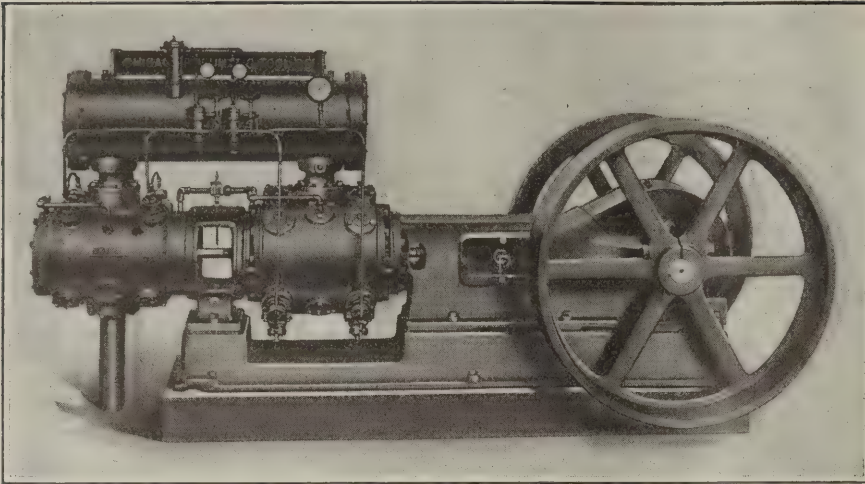
moved except by breaking the glass. A special bag is provided for catching the broken pieces.

### Straight Line Two-Stage Air Compressor

The low power consumption per cubic foot of air delivered and the favorable physical conditions of the air resulting from two-stage compression have long been recognized by compressed-air users, but the initial cost of the compressor and the expense of installation have heretofore overbalanced these favorable features, with the result that only machines of large capacity have been available—the majority of which have been of the duplex construction.

Such construction, while entirely logi-





**Two-Stage Compressor Arranged for Belt or Motor Drive**

This tandem unit is arranged so that all the stuffing boxes are easily accessible. The intercooler is rigidly mounted above the two cylinders and may be reached from either end. Automatic start and stop control apparatus, together with automatic unloading features, makes it easy to start or stop the compressor from remote points.

cal for machines of over 500 cu.ft. piston displacement, has proved too expensive to manufacture for smaller capacities, besides being too costly to install because of the complicated foundation required and the nicety called for in aligning the machine. Furthermore, the average compressed-air user has in the past neglected to look carefully into the power costs involved in operating single-stage air compressors of smaller capacities. Now, however, the economies required by present highly competitive business conditions make it necessary that every operating cost be reduced to the minimum, particularly power costs.

In order to meet the conditions outlined above, the Chicago pneumatic straight-line two-stage belt- or motor-driven air compressor has been developed. Operating at 275 r.p.m., this compressor has a piston displacement of 360 cu.ft. of free air per minute; air pressures range up to 125 lb. It is adapted to be driven by a belt or by a synchronous motor with rotor mounted directly on the compressor crankshaft.

Tandem construction is used in this unit, in which the low-pressure cylinder is placed next to the frame and the high-pressure cylinder is connected to the low-pressure cylinder by means of a tandem piece through which the piston-rod stuffing boxes are easily accessible. The intercooler is rigidly mounted above the two cylinders, in which location it is convenient for cleaning, which may be done from either end.

The whole unit is mounted upon a substantial subbase which gives the rigidity so desirable in a machine of this class. Perfect alignment of the machine is assured, resulting in maintained high mechanical efficiency and consequently prolonged life. This feature also gives the unit a degree of portability not realized in duplex construction and for this reason it will appeal to those compressed-air users who frequently employ semi-permanent installations.

On first thought it might appear that the bearing pressures in such tandem construction are unusually high, but such is not the case, as the maximum

pressures are even lower than those found in single-stage machines of equal size.

The whole unit is remarkable for its accessibility and ease of adjustment. The bearings are readily gotten at and adjusted with a minimum of exertion; especially is this true of the wedge adjusted connecting-rod bearings, which are so easily and conveniently adjusted that the operator is encouraged to keep them in perfect condition, thereby eliminating the most frequent cause of compressor failures.

Simple air valves are used throughout, assuring high efficiency and trouble-proof operation of the most vital part of the compressor.

Automatic operation is attained in a high degree. Splash and flood system of lubrication is employed for all bearings and the cylinders may be lubricated by the standard sight-feed lubricator, by a pneumatically operated force-feed lubricator, or by a mechanically driven force-feed lubricator.

Regulation of the volume of air and its pressure is entirely automatic and can be made to conform to the special conditions of the demand for air. Three-step capacity regulation is furnished in which two differential unloaders operating automatic unloading simple inlet valves cause the compressor to operate at full, half and no load, according to the air demand, with maximum efficiency and evenly distributed crankshaft torque. Such operation results in splendid load characteristics for the driving

motor since the steps are clearly defined in loading and unloading, obviating any surges in the power line that would otherwise result.

When the air demand is fairly constant for periods in the day, with intervening periods in which there is slight or no demand for air, and the compressor is driven by an electric motor, automatic start and stop control operation can be employed, in which case the unit is equipped with a centrifugal unloader which causes the automatic unloading inlet valves to be held open during the period in which the compressor is at a standstill and to remain open until, in starting again, the compressor has nearly reached normal speed, when the valves are again allowed to operate.

During slowing down prior to stopping, the unloader comes into action, throwing the load off the compressor, thereby eliminating much objectionable slapping of the belt in the case of a belt-driven unit. Complete automatic operation of the unit with utmost economy is effected through the use of a water-control valve which automatically stops the flow of cooling water through the jackets and intercooler during periods in which the compressor is at a standstill and allows it to flow when the compressor is in operation.

### High-Speed Motor Operates This Grinding Wheel

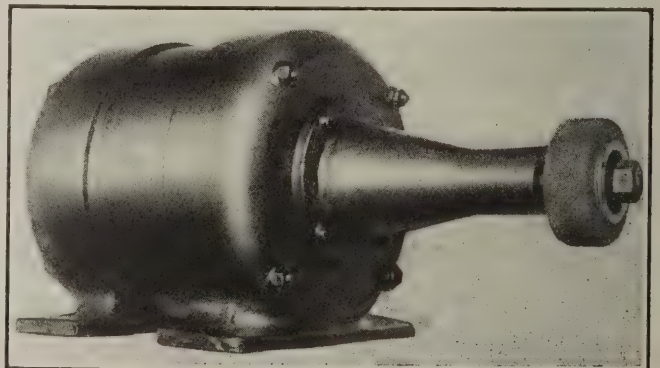
Forbes & Meyer, 192 Union St., Worcester, Mass., has developed a new grinder. The motor is of the induction type, giving speeds of 5,400 or 7,200 on 60-cycle three-phase current. Such speeds have generally been considered impossible with the induction type of motor, but have been accomplished by using two primary windings, each receiving current directly from the line, while both act on a common secondary member. The motor is fully inclosed.

The grinding wheel is mounted directly on the motor shaft. It is supported by three ball bearings, one close to the wheel, and one at each side of the motor. This makes the machine run smoother than it would if it were attempted to support as long a shaft as this on two bearings. The wheel is spaced 7 in. from the motor so as to avoid interference.

The 5,400 speed of the motor is correct for 4-in. to 4½-in. diameter wheels, and 7,200 is the speed for wheels of about 3 in. in diameter, though smaller wheels can be used efficiently.

#### Grinder and Motor on Same Shaft

Three ball bearings permit the grinder to operate efficiently. A specially designed high-speed motor drives the small wheel at 7,200 r.p.m.





# COAL AGE

McGraw-Hill Company, Inc.  
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## Keep Up With Progress

**E**LECTRICAL failures, like mine fires, often arise from neglect or ignorance. Many times common sense dictates that certain changes be made in electrical equipment. If these are neglected disaster is likely to follow.

In the early development and application of electrical apparatus many installations were made in a way which today appear crude and unsafe. This was quite natural; it was pioneering work. Our forefathers didn't go West in aeroplanes or even automobiles and not all of them traveled in covered wagons.

Procrastination or lack of respect for the opinion of an electrical engineer nearly caused a serious mine fire recently in one of the largest anthracite mines. It appears that inside this mine, some few years ago, several circuit breakers were installed in an asbestos-lined wooden box. The engineer had lately recommended that the breakers be inclosed in separate steel cabinets but the necessary appropriation never came. One night something went wrong with one of the breakers and all were destroyed and a mine fire narrowly averted.

It is apparent that the loss of the breakers and the delay to the mine was much greater than the cost of a safe cabinet. Mine fires are indirect causes of high operating expense and increases in the price of anthracite. Mine managers should learn to appreciate the judgment of the electrical engineer and cease to look upon him as a necessary evil and a spender of profits.

## Overloading Locomotives

**E**FFICIENCY in operation is promoted by attaching only reasonable loads to electric locomotives. The tendency is to load them down with all they can be made to haul, but certainty of operation is usually more important than maximum tractive effort. The railroads are learning this, with the result that the number of train miles has been greatly increased. A bucking locomotive holds up operation lamentably. It may come through with its trip but with what delays and what dangers. As to the latter it may be said that a trip that is too heavy is usually as greatly lacking in braking power as in tractive effort and so is liable to run away on grades.

When too much is demanded of a locomotive the motors may be burned or the locomotive may tie up machines by its excessive draft on the current strength. It may kick out the circuit breaker. Excessive use of sand may insulate its wheels from the rails and cause the current to run back along the cars. It may interpose an excessive resistance. Instead of bragging as to how much "she" can haul it is better to have a certain maximum load and not exceed it. A fine performance may be obtained at an entirely undue expense. A locomotive should be kept pulling its normal load, running according to schedule without drawing too heavily on the current and without heating.

Consistent running is what is needed. If a larger output is wanted add another locomotive, replace the present machine by one that is larger, ease the heavier grades or introduce anti-friction bearing cars, but do not overload the locomotive. That is the poorest kind of economy and may actually reduce tonnage by crippling the overloaded locomotive, so that it will not haul even a normal load.

## Harrington and the Flame Safety Lamp

**W**E CANNOT join with Harrington in his wholesale condemnation of the flame safety lamp. He records, of course, the accidents it has caused and not the accidents it has prevented. He could do no other, if he so desired. Yet we feel that in the article that appears in this week's issue he has done the public a service.

The flame safety lamp when carried with an electric lamp is not so likely to be tampered with as when carried alone, for the man carrying it can proceed rapidly and safely to the relighting station if it should be extinguished. The readiness with which the flame lamp is put out is one of its most undesirable characteristics especially because of the natural desire of the user to relight it at the earliest possible moment. Unfortunately, an electric lamp gives such a brilliant light, that unless it is kept away from the eyes of the user he is not able with his pupils thus dilated to read the faint blue flame of the safety lamp with exactitude.

Some carry flashlights, but these lamps might cause an explosion if the bulb were broken. There are doubtless other defects. These might be corrected, but so far that has not been done at least in the United States. It would be well if the defects were removed, then the man who tested for gas could do it with precision and yet would have the flashlight to guide him into safety if the flame safety lamp failed.

However, men are constitutionally averse to labor and others are only too anxious to perform their allotted task. In either case they are apt to take a chance and to open their safety lamps in order to relight them. A safe relighting device would be a blessing, but unfortunately a lamp soon fills with an explosive mixture if in a gassy place.

When the lamp is relighted unless the device for relighting acts instantaneously and automatically, as it does in one form of mine lamp, it causes an explosion within the gauze which may be violent enough to ignite the gas surrounding the lamp. All these are reasons why the flame safety lamp is not safe but at present only the Burrell testing equipment is available, and it is said to be slower and less readily understood though far more accurate than the flame safety lamp. No wonder inventors are hard at work in Europe to produce methanometers that will be simple and continuously reliable.

Where shotfiring is done by electricity and by specially appointed men, and where miners are prevented



from smuggling powder and fuse into the mine, there is little risk that the miner will open his safety lamp to fire a fuse, though miners have been known to shoot down coal surreptitiously rather than be deprived of their day's shift when a shot has missed fire or failed to bring down the coal.

The operator should either arrange for testing by the Burrell method or should contrive in every way to prevent all contingencies that would make the opening of a safety lamp in a questionable place seem desirable to the foreman, fireboss, shotboss or other mine worker. Furthermore, he should use judgment in selecting his lampmen so that the lamps will be always in repair, safe in themselves and properly assembled. And again, he should render his mine so safe by adequate rock-dusting that any explosion would be limited closely to the area occupied by the explosive mixture of gas and air, assuming, what has not been proved, that inert dust has no power to extinguish an explosion that is solely of gas and not of coal dust and possibly a little methane.

### Face the Facts

FOR YEARS we have proceeded with the notion that the mine foreman knew, or could know, enough to assure the safety of his mine. Now we are clearly convinced that unless we have an entirely new crop of foremen we cannot expect any such competence. Where such foremen are to be found no one knows. They would need to be electricians as well as mining experts, and few qualify in that direction. The mine foreman under the law is in control of the electrician. If the former is wise he leaves the electrician quite largely alone relying on him with his superior, the electrical engineer, to keep the wiring and bonding safe and insisting only that he does not violate the elementary principles of mine safety.

Unfortunately the foreman too often condones practices with regard to electrical apparatus, that do not make for safety, economy or efficiency. He does not know when machinery is properly protected. He does not condemn equipment that is in dangerous condition. He overloads motors and locomotives. He demands short and unsafe cuts. He means well but he does not understand electric current. We do not like to recommend two heads in a mine who may jangle and waste their effort in mutual incriminations. Still we believe the mine electrician should be certified and have charge of certain equipment with full responsibility for its safe keeping.

We think state mine inspectors should be trained to examine electric machinery in a competent manner. The department should have an inspector to train them and occasionally go from mine to mine with them showing them just what they should watch. Electrical hazards are real. They do not all end in electric shock. Overloading a locomotive may cause a runaway. Faulty upkeep of a fan motor may end in an explosion. The flashing of a defective rheostat may have a like effect. A short circuit may cause a mine fire. A defective battery may burn the man carrying it. A stray current from a locomotive or a stationary motor may cause a premature shot. Consequently many accidents now classified as non-electrical may have an electrical origin or at least a cause that a competent electrical engineer should of all men be the most able to remove.

Let us face the facts. The mine foreman cannot be

a competent electrician and he should relinquish to the latter all responsibility for the correct installation and manipulation of electrical equipment.

### His Life for Labor

ROBERT SMILLIE, the protagonist of the mine worker, has written his book "My Life for Labor," and his story of his early life as reviewed by a New York newspaper seems centered about wrongs in mining life that all the years he has spent in labor unionism have not removed—poor lighting, dangerous roof and falling water.

As for the lighting which might have been greatly benefited and is being improved, the union has done nothing except by opposition. One of these days we shall have mines that are well illuminated, but the way will be shown by the operator. The mine worker is content. He has struck against the electric mine lamp, and when stationary lamps have been installed to light his working place he has stolen the bulbs. But lighting, somewhat satisfactory lighting, is coming. No one can blame the operators of Smillie's youth that they did not have anything but a flame lamp to light his working place.

And as for the roof that nearly ended his career while a mere stripling, it is much the same menace it ever was. Labor unions have done little but sustain the miner in doing just as Smillie did. He left the roof unpropped and it fell, fifteen-hundredweight of it on a pile of "dross" (undercuttings) he had scraped for a seat from which to extend his undercut.

The roof still drips in shallow mines and in some deep ones. Unionism has done and can do nothing for it. It is inherent in mining and cannot be avoided. Fortunately it does not seem to have proved particularly harmful to health.

But the condition of the miner, nevertheless, has improved. We cannot blame the British operator of sixty years ago because he did not give his employee all the labor-saving equipment he provides today. Most of it was not so much as known in those days. Smillie would give little credit to invention and capital and a great deal to unionism, but one can well question if the first two have not been the workingman's friend and the third an extremely doubtful supporter.

Unionism has nearly always been against labor-easing devices, the mechanisms that lay on the machine the labor and burden of the day. But when the machine is established how cheerfully and successfully does the labor agitator proceed to lay his hand on the sacred pages of history and say that it is unionism and the social struggle that has lightened the burden of the worker. Smillie's book would appear thus to distort history, twisting it ever to suit his purpose.

His life for labor, what has it effected? Much we fear that it has produced nothing but the bitter fruits of high-cost coal for the workingman, high cost of living for the laborer, discontent and social unrest, whereas the work of the inventor and of the practical industrialist has lightened toil, made possible shorter hours and put a premium on the mind rather than on the limbs of the worker. The technical man is not invited to be Minister of two Governments as Robert Smillie has been, but none the less he does more effectually than labor agitators and politicians what governments, if they are good governments, seek to accomplish, but often alas in vain.





Drilling a Sheared Face

# Vertical Shearing Saves Powder But Makes Slack

Utah Fuel Co. Does Not Adopt It After Exhaustive Tests—Center Shear Cut Is Tried with Both Top and Bottom Cuts in Narrow Work and Rooms

BY E. W. DAVIDSON  
Associate Editor, *Coal Age*, Chicago, Ill.

IS VERTICAL cutting in rooms and entries economical? A good many coal mining men have asked themselves this question. Some have tried to find out by experience. T. A. Stroup, superintendent of the Clear Creek mines of the Utah Fuel Co., after exhaustive tests has concluded that, so far as the brittle Clear Creek coal is concerned, vertical cutting loses more money than it saves. The tests showed that vertical cutting is less expensive than horizontal and that a center shearing cut down through a face that has been top or bottom cut reduces powder cost per ton more than 50 per cent, but the percentage of slack produced in places only 12 to 14 ft. wide is more than doubled and is greatly increased even in full-width rooms. Thus the good effect is nullified. So vertical cutting is not standard practice in Clear Creek.

The 90-day tests which Mr. Stroup ran amassed a wealth of data on vertical cutting such as has been hard to find in the past in the coal industry. So it is of value. Some of the tests were run in entry work in No. 3 mine of the Clear Creek group where entries were supposed to be 12 ft. wide; there was so much overrunning of machines, however, that much of the work was fully 14 ft. in width and the results thus were somewhat comparable to those that might be gotten in room work. Other tests were in 18- and 20-ft. rooms. The studies included top cutting alone, bottom cutting alone and vertical center shearing in combination with either one or the other. Comparisons were made of the

time consumed in cutting, the quantity of explosives used and the proportions of slack produced by the cutting process alone and by both cutting and shooting. After a place had been shot it was loaded out with 1½-in. coke forks. Everything that went through the forks was weighed separately as slack.

The machines used in Mr. Stroup's tests were an Oldroyd universal cutter, a Goodman straight face machine and a Jeffrey 35-B shortwall. Comparative runs were made with these machines but the results were not intended to illustrate the relative merits of the machines but are held to apply only to the methods.

A general summary of important results showed that

Table I—Time Consumed in Cutting Places  
Shearing Machine Top Cut and Center Sheared, All Places

Place	Width, Ft.	Height, Ft.	Depth, Ft.	Time Cutting, Min.	Time Shearing, Min.	Total Time, Min.	Tons per Place	Time per Ton, Min.
A	14	7	8½	27	8	35	35.625	1.14
B	13	7	8½	25	8	33	25.23	1.31
C	12	6	8½	26	8	34	21.84	1.55
D	13	6	8½	35	7	42	25.25	1.66
E	14	7	9½	24	9	33	24.28	1.36
Average.....						35.4	25.445	1.39

Straightface Machine, Top Cut, All Places							
Place	Width, Ft.	Height, Ft.	Depth, Ft.	Time of Cutting, Min.	Tons per Place	Time per Ton, Min.	
1	12½	7½	6	17	17.595	.97	
2	12	7	6½	19	15.975	1.20	
3	12	7	6½	18	15.015	1.20	
4	12½	7½	6	17	16.655	1.02	
Average.....				17.8	15.810	1.10	

NOTE—The illustration forming the headpiece shows the arrangement of shots employed to bring down a face that has been undercut and sheared, with the fewest and lightest charges. Much big coal was produced by this method but the large amount of bugdust made by the machines offset all advantages gained.





### Self Condemned

In passages 12 to 14 ft. wide center shearing nearly doubled the quantity of bugdust made by the machines as may be judged by the great pile of this material in the foreground. In wider work the proportion of cuttings was not so large but enough to render the process of vertical cutting uneconomical.

in places top cut and center sheared by the shearing machine, the cutting time per ton averaged 1.39 minutes, slack produced by cutting averaged 11.8 per cent, total slack from cutting and shooting averaged 27.3 per cent and powder cost per ton averaged 3.91c. Places merely top cut by the straightface machine gave the following results: Cutting time per ton, 1.10 minutes; slack made by cutting, 6.64 per cent; total slack made by cutting and shooting, 13.17 per cent (excluding results from one place which was badly overshot); powder cost per ton, 9.2c. Thus it is shown that powder costs per ton in places center sheared and top

Table II—Slack Produced by Cutting Operation

Shearing Machine, Top Cut and Center Sheared, All Places							
Place	Width, Ft.	Height, Ft.	Area of Top Cut, Ft.	Area of shear, Ft.	Area of face, Ft.	Area out cut, Ft.	Per Cent slack
A	14	7	7	3½	98	10½	11.8
B	13	7	6½	3½	91	10	11.0
C	12	6	6	3	72	9	12.4
D	13	6	6½	3	78	9½	12.2
E	14	7	7	3½	98	10½	11.8

Straightface Machine, Top Cut All Places					
Place	Width, Ft.	Height, Ft.	Area of top cut, Ft.	Area of face, Ft.	Per Cent slack
1	12½	7½	6½	93½	6.1
2	12	7	6	84	7.0
3	12	7	6	84	7.0
4	12½	7½	6½	93½	6.1
5	12	7	7	84	7.0

cut were much less than half those in places merely top cut.

In places bottom cut and center sheared by the shearing machine, as compared to those merely bottom cut by a shortwall machine, the results were these: Bottom

Table III—Production of Slack by Weight After Shooting

Shearing Machine, Top Cut and Center Sheared, All Places			
Place	Total Tons	Total Slack	Per Cent of Slack
A.....	30.625	7.69	25
B.....	25.23	6.575	26
C.....	21.84	4.45	20.4
D.....	25.25	9.55	37.8

Straightface Machine, Top Cut, All Places			
Place	Total Tons	Total Slack	Per Cent of Slack
1.....	17.595	1.85	10.5
2.....	15.975	2.25	14.0
3.....	15.015	4.355	*29.0
4.....	16.555	2.50	15.0

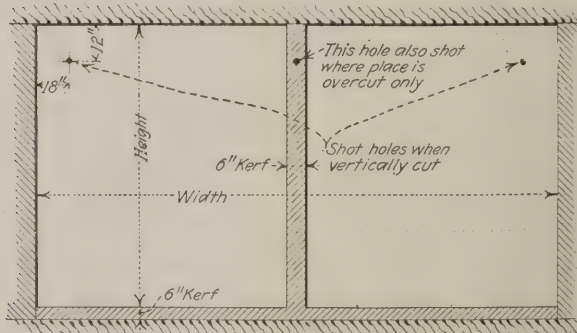
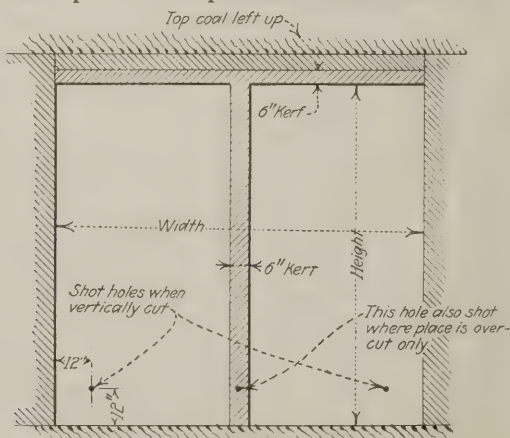
\* Overshot.

Table IV—Powder Consumption

Places Top Cut and Center Sheared by Shearing Machine					
Place	Tons of coal	Powder, Lbs.	Cost of powder	Powder used per ton of coal, Lb.	Powder cost per ton of coal
A.....	30.625	4	\$1.00	.13	\$.0327
B.....	25.23	4	1.00	.156	.039
C.....	21.84	4	1.00	.184	.046
D.....	25.25	4	1.00	.156	.039
E.....	24.28	4	1.00	.164	.041
Average.....				.158	.0391

Places Top Cut by Straightface Machine					
Place	Tons of coal	Powder, lb.	Cost of powder	Powder used per ton of coal, lb.	Powder cost per ton of coal
1.....	17.595	6	\$1.50	.340	\$.085
2.....	15.975	6	1.50	.376	.094
3.....	15.015	6	1.50	.400	.100
4.....	16.655	6	1.50	.360	.090
Average.....				.369	.092



Arrangement of Cuts and Shot Holes

It will be observed that center shearing a place that has been either undercut or overcut eliminates the necessity for one shot hole. Because of vibration of the cutter bar when making the shear this kerf is appreciably wider than those either above or below the coal.



Table V—Time Consumed in Cutting Places

All Places Bottom Cut and Center Sheared by Shearing Machine							
Room	Width, Ft.	Height, Ft.	Depth, Ft.	Time Cutting, Min.	Time Shearing, Min.	Time Total, Min.	Tons per Place
A	20	6	9	30	10	40	33.29
B	20	6½	9	20	17	37	30.26
C	20	5	9	26	12	38	32.76
D	18	5	9	23	12	35	28.62
E	20	7	9	27	11	38	33.17
F	18	6	9	28	10	38	31.99

All Places Bottom Cut by Shortwall Machine						
Room	Width, ft.	Height, ft.	Depth, ft.	Time cutting, Min.	Tons per place	Time per ton, min.
1	20	5½	5½	38	27.97	1.4
2	18	7	5½	35	24.67	1.4
3	18	6	5½	36	26.53	1.4

cut and center sheared places required an average of 1.2 minutes of cutting time, per ton, they produced 11.6 per cent of slack from cutting alone and a total of 25.3 per cent of slack from both cutting and shooting, the cost for powder was 2.41c. per ton of coal produced. Places merely bottom cut averaged 1.4 minutes of cutting time, per ton, produced 8 per cent slack from cutting alone and 29.83 per cent of slack from cutting and shooting, while powder costs were 5c. per ton. Thus again, the expense incurred for powder was reduced more than 50 per cent by center shearing.

One explanation for the excessive amount of slack made by the shearing machine is that vertical cuts invariably have a kerf almost half again as wide as those made horizontally. Mr. Stroup says his experi-

Table VI—Slack Produced by Cutting Operation

Places Bottom Cut and Center Sheared by Shearing Machine							
Room	Width, Ft.	Height, Ft.	Area Cut, Ft.	Area Shear, Ft.	Area Face, Ft.	Total Area Cut, Ft.	Per Cent Slack
A	20	6	10	3	120	13	10.8
B	20	6½	10	3½	130	13½	11.5
C	20	5	10	2	100	12½	12.5
D	18	5	9	2	90	11½	13
E	20	7	10	3	140	13½	9.6
F	18	6	9	3	108	12	11

Places Bottom Cut by Shortwall Machine						
Room	Width, Ft.	Height, Ft.	Area Cut, Ft.	Area Face, Ft.	Per Cent Slack	Per Cent Slack by Weight
1	20	5½	10	110	9	
2	18	7	9	126	7	
3	18	6	9	108	8.3	8.5

ence was that a vertical cut, starting from the top, could always be made quickly because of the weight of the cutterbar acting in a downward direction, but that the bar was certain to vibrate considerably, thus making a wide gash in the coal. A cutter that ordinarily would make a 6-in. horizontal kerf usually made a 9-in. kerf in a vertical cut.

“The reduction in powder consumption was outstanding in all the tests,” said Mr. Stroup, in a report that was written for presentation before but which was never read at any meeting of the Rocky Mountain Coal Mining Institute. “So marked has this saving been that I venture to predict that if vertical cutting as an ad-

Table VII—Percentage of Slack by Weight

Places Bottom Cut and Center Sheared by Shearing Machine			
Room	Total Tons	Total Slack	Per Cent Slack
A	33.29	8.92	27
B	30.26	7.65	25
C	32.76	9.21	28
D	28.62	6.45	22½
E	33.17	8.22	25
F	31.99	7.87	24½

Places Bottom Cut by Shortwall Machine			
Room	Total Tons	Total Slack	Per Cent Slack
1	27.97	8.56	30½
2	24.67	7.85	32
3	26.53	7.30	27

Table VIII—Powder Per Ton of Coal Produced

Places Bottom Cut and Center Sheared by Shearing Machine					
Room	Tons Coal	Powder, Lbs.	Cost of Powder	Powder per Ton of Coal, Lbs.	Powder Cost, Per Ton
A	33.29	3	\$.75	.09	\$.02½
B	30.26	3	.75	.10	.02½
C	32.76	3	.75	.09	.02½
D	28.62	3½	.87½	.12	.03
E	33.17	3	.75	.09	.02½
F	31.99	3	.75	.09	.02½

Places Bottom Cut by Shortwall Machine					
Room	Tons Coal	Powder Lbs.	Cost of Powder	Powder per Ton of Coal, Lbs.	Powder Cost per Ton
1	27.97	5	1.25	.18	\$.04½
2	24.67	6	1.50	.24	.06
3	26.53	5	1.25	.18	.04½

junct to horizontal cutting is ever widely adopted it will be to bring about economy in explosives.

“The use of the vertical cutting method either alone or in conjunction with horizontal cuts for the usual room and entry work being thus disposed of the question of utilizing this method for drawing pillars was considered. It was hoped to cut pillars that were too heavy for horizontal cutting by a method of crosscutting and then drawing the stump; but the great length of the shearing machine made it necessary to do much of the cutting on the curve leading into the place.”



Shot Down

This shows the results of good shooting in a room that had been undercut and center sheared. As may be seen much big lump coal was produced. What cannot be seen, however, is the proportion of fine cuttings made by the machine.



# Flame Safety Lamp Proves Source of Danger

Several Explosions Caused by Safety Lamps Briefly Reviewed —  
Such Lamps Cannot Be Trusted Even in Hands of Certified  
Officials—They Should Never Be Used When a Shift Is at Work

BY D. HARRINGTON  
Salt Lake City, Utah

**"F**AMILIARITY breeds contempt" is a saying which certainly should not apply to anything so dangerous as explosive gas in coal mines, yet actual occurrences seem to prove that either contempt or carelessness is all too frequently found in present-day practices with respect to methane in mines, and particularly is this true as to the use of safety lamps. In three of our western states, ignition of methane from modern flame safety lamps in the hands of fireboss or safety man has resulted in six disasters, the death of practically 500 men and financial loss of considerably over \$2,000,000. In each instance the careless person causing the ignition lost his life. Four of these explosions with a total death toll of 412 took place within the past seven years.

In each of these disasters caused by gas ignition from flame safety lamps, the user of the lamp held a certificate of competency as a fireboss, a gas examiner or a mine foreman, and in at least three of the six cases, had a certificate of competency and experience in Great Britain as well as in the United States.

In two cases resulting in 220 deaths, the flame safety lamp was taken apart by the fireboss in the mine, and the gas ignition was caused when an ordinary match was being used to relight it. The burnt match in both cases was found near the disassembled lamp.

In at least two cases the safety lamps were modern and up-to-date and although provided with safety igniters or relighters and although these relighters were in place, they were not in condition to use. In one of these two cases the lamp was of the key-locked type; in the other it was magnetically locked. In both instances the mines were operated with closed lights, the miners using electric safety lamps, and the inspectors or safety men carrying flame safety lamps.

In two of these six disasters, the ignition was caused by improperly assembled safety lamps and in one case by a misuse of an apparently well-assembled lamp. In all six instances, the disaster occurred while an attempt was being made to remove gas accumulations during a working shift. In no case was the Davy lamp involved and in four out of the six instances the mine was operating with closed lights.

These six comparatively recent disasters in three states caused by methane ignition by flame safety lamps in the hands of men holding certificates of competency, leads one to doubt whether the designation flame *safety* lamp is not a misnomer. If they are not safe in the hands of the foreman, fireboss or safety man possessing a certificate of competency in their use, how can they be considered safe in the hands of miners not one in ten of whom has even a faint idea as to the tests to which a flame safety lamp should be subjected to determine its actual safeness and only a few of whom know the lamp's limitations or the correct methods of using it?

## DETHRONING THE FLAME SAFETY LAMP

**A**FTER a long and intimate acquaintance with coal mines, especially those in the Rocky Mountain region, where he served as an engineer for the Bureau of Mines, the author of this article has come to distrust all flame safety lamps when used for any purpose other than gas testing. He states that they started the Hastings explosion in Colorado in 1917, when 121 men lost their lives, the Kemmerer explosion in Wyoming in 1923 that killed 99, and the Castle Gate disaster last March which sent 172 miners to Kingdom Come; to say nothing of the hundreds of thousands of dollars of property loss that these explosions caused the mining companies. He for one, is "not at all inclined to place the safety lamp on an altar and worship it as so many coal-mining men are inclined to do." He sounds a distinct warning concerning the danger of these lamps.

It seems to be anything but safe to place any kind of flame safety lamp in the hands of the miner and I am particularly opposed to the practice of relying upon the machine runner in "slightly" gaseous mines to inspect working places for gas with a flame safety lamp before operating the electrically driven coal-cutting machines.

The disasters mentioned are only a few of those that have been started by flame safety lamps, and they are instanced here only because I happen to be personally familiar with the surrounding circumstances. Doubtless there have been numerous others.

In any event there have been many cases in which the users of the flame safety lamps have been burned. Furthermore, I have had called to my attention many practices likely to result in disaster. Among the most dangerous are the various methods used with flame safety lamps to "spit" fuse or squibs. Any place that is sufficiently gaseous to require closed lights is too gaseous for the safe use of fuse or squibs in blasting. If fuse or squibs are not in themselves dangerous, the methods employed in igniting them are likely to be decidedly dangerous.

As it appears to be fairly well established that ignition of methane starts nearly three-fourths of our coal-mine explosions, it seems only sensible that in any mine where methane occurs nothing but closed lights should be used. And in view of the danger incurred from flame safety lamps and the little light they give, I am convinced of the advisability of using only permissible electric lamps in mines that give off methane. This is particularly the case as it is claimed that the



newer types of permissible electric cap lamps will give as much light as carbide lamps.

A mine that has encountered no explosive gas in many years of work may overnight become definitely gaseous. This has actually occurred in more than one instance. This situation, together with the fact that open lights have started many fires in both gaseous and non-gaseous mines and have caused dust ignition both in mines and on tipples, leads me to the belief that open lights should be excluded from non-gaseous coal mines as well as those known to make methane.

In fact, up-to-date thought tends towards exclusion of open lights from *all* mines, including metal mines. Several large metal-mining companies are now experimenting upon the use of up-to-date electric safety lamps in their operations. Furthermore, the State of Utah requires the use of closed lights in non-gaseous as well as in gaseous mines.

#### CLOSED LIGHTS ALONE DO NOT GUARANTEE SAFETY

However, when the mine is placed on a closed-light basis, it is absolutely essential that other precautionary measures be not neglected. It is inconsistent, to say the least, to employ closed lights yet simultaneously have in use near working faces non-permissible electric coal-cutting machines, electric pumps, booster fans or other flame-producing electrical equipment. It is certainly not safe to allow smoking in a closed-lamp mine, to fail to make frequent search for matches or to fail to severely punish anyone taking matches or smoking materials into such a mine. Similarly it seems decidedly dangerous to blast during a shift in a closed-lamp mine, particularly if the blasting is done with fuse or squibs and black powder, and more especially if the coal is shot off the solid.

Standing gas should not be moved while men are on shift. This is true even if only closed lights are in use.

As far as possible, flame safety lamps should be excluded from mines when employed for anything other than inspection purposes, and even then they should be entrusted only to qualified men. Without exception they should be of the permissible, magnetically-locked type equipped with relighters, and any person, who for any reason whatsoever, takes a flame safety lamp apart underground, except in stations designated especially for the relighting of lamps, should be given the extreme penalty of the law. And this penalty should be made as severe as for attempted wholesale murder.

#### FLAME SAFETY LAMP AROUSES SUSPICION

I have examined a large number of mines after explosions and in almost every one, the inquiry was made (not always by me) as to the whereabouts of mine foreman, fireboss or safety man, and particularly as to where the flame safety lamp was found and what was its condition. This indicates the widespread suspicion directed towards the flame safety lamp.

A state mine inspector informed me that upon examination of records as to mine explosions in his state, it was found that 80 per cent were started by the mine officials (superintendent, foreman, fireboss, safety inspector) and that a large part of the disasters were caused by handling gas (usually with the shift in the mine) and in several instances a flame safety lamp caused the ignition.

It seems definitely dangerous to permit firebosses to examine old workings (where it is extremely probable

explosive gas may be found) while the shift is in the mine; yet this is the common practice.

Though the magnetically locked permissible flame safety lamp is recommended for use where lamps of this general type must be employed, many old timers refuse to change over from the lamp they have used for years and even when they do change over, they are prone to "re-make" the permissible lamps in accordance with their own ideas. When the relighters become worn and cause a little trouble, they are discarded or removed and the hole plugged. In one instance the relighter was removed and the hole left open with a resultant ignition of gas.

#### GAUZE REMOVED TO QUICKEN LAMP ACTION

One old-time fireboss thought two gauzes made the lamp "slow"; so one gauze was removed. Gaskets have been omitted entirely or defective ones used. I recently saw a modern up-to-date flame safety lamp taken into a mine for gas testing, and the glass cylinder had a V-shaped nick extending down more than a quarter of an inch. Fortunately no gas was encountered.

Firebosses at times remove the locking devices from permissible flame safety lamps. Others drill a tiny hole in such manner that the insertion of a pin opens the lamp. Some claim to be able to open the magnetically locked permissible lamps at underground trolley frogs and others by subjecting the lamps to a certain method of jarring.

So long as this attitude toward permissible flame safety lamps is taken by officials on whom depends the safety of the mine and its workers, there doesn't appear to be any definite guarantee that the permissible lamps will be much safer than the Davy. At any rate, the fireboss, foreman, or other person taking a flame safety lamp into a mine, while a shift is in, should be compelled to test the lighted lamp before going into the workings in an explosive gas mixture by hanging it free in a gas-testing box. Furthermore, any certificated man using a flame safety lamp in a mine in which a shift is at work and having matches or smoking materials in his possession should have his certificate revoked and be prosecuted under the law, provided the statute carries any penalty for such an offence.

#### FLAME SAFETY LAMP IS NOT FOOLPROOF

There is decidedly too much tendency to assume that the flame safety lamp is foolproof. In recent years I have felt uncomfortable when in a gaseous mine where a number of flame safety lamps are in continuous use even when so-called certificated men are using them. It seems desirable not only that all users of flame safety lamps should be cautious and careful but it also seems advisable to exclude as far as possible, *all* flame safety lamps from closed-lamp mines, or in fact from all mines, when the shift is working.

The Burrell methane detector is much more accurate in detecting gas than is the flame safety lamp and while more time is required per test, there is absolutely no reason why this or some similar instrument should not be used for gas testing in mines when the shift is at work, reserving the flame safety lamp for the fireboss' examinations before the shift comes on.

Meanwhile, there should be a determined effort toward the invention of *some safe* efficient method of gas testing, so that the treacherous misnamed flame safety lamp may be entirely excluded from mines.





## Lake Coal Runs Eventful Course from Mining Field to Northwest Ports

Every Year About Twenty-five Million Tons of It  
Make Summer a Busy Season on the Great Lakes for the  
World's Most Massive Material Handling Machines

**L**AKE coal may travel as far as 600 miles by rail (1) and may go through the hands of as many as 10 train and yard crews before it gets anywhere near water. Finally it arrives in a yard on the lake front (2) at one of the dumping ports on Lake Erie. From here it is pushed by a switch engine up over a hump or "high grade," each car coasting down over a pit between rails. Out of this pit rises "the pig," a squat, heavy, pusher car hauled by a steel rope. The pig moves the load up a short grade and onto the car dumper.

A car of coal, in the grip of the dumping machine (3), is hoisted about 50 ft. in the air. Then, whoosh! The whole 50 tons goes down an apron and through a flexible spout into the vessel (4); cars are dumped one a minute. An operator in a cabin mounted on the apron manipulates the steam-operated spout, swinging

it to and fro like an elephant's trunk. Thus the load is trimmed in the boat so neatly that scarcely a shovelful is spilled over the top of each hatch. The coal then travels up the lakes 800 miles or so to a Lake Superior dock, in a boat that may carry 14,000 tons, or about six 50-car trainloads.

At the Head of the Lakes the boat ties up beside a dock that may be big enough to hold a million tons of coal and the unloading is done by gigantic Hulett (5) which gulp up 15 tons of coal at a bite, delivering each "bite" into a larry car that rides within the frame of the machine. This larry car transports the coal back from the dock edge and delivers it on the ground within easy reach of immense traveling bridge cranes, some of them 700 ft. long, which store the coal on any part of the great dock, ready for reshipment inland throughout the Northwest.



# Block System of Mining Coal Has Many Advantages

It Reduces Danger, Increases Percentage of Extraction and Results in Coarser, Cleaner Output—Room-and-Pillar Mines Can Be Converted to Block Method Mainly by Widening Centers

BY H. R. BISSELL

Chief Engineer Rosedale Coal Co., Morgantown, W. Va.

**C**ONTRARY to popular belief there is nothing complicated about the block system of mining coal. If the present room-and-pillar system is taken as a foundation and the centers of the rooms as well as those of the crosscuts are widened out to a maximum and uniform figure, the block system will result. Thus the relationship between the two methods is close.

It is surprising to find the number of operators who are still working upon the old idea of narrow centers. The mine maps of such coal producers would show that nine out of ten of them have large areas developed and standing in a semi-squeezed condition. The coal in such cases is mostly lost, or, if mined, is recovered only at an excessive cost. The fundamental idea of mining according to this method appears to be to concentrate in developing entries and rooms, spacing the latter as close together as possible so as to secure production more quickly, also to make the room breakthroughs easier to drive.

In such mines, from 50 to 60 per cent of the coal is secured in first mining. The balance is left as a necessary evil to be removed by pick and shovel at a higher labor expense, a lower production per man, a higher haulage cost, an excessive use of timber and a high cost for cleaning up falls and retimbering. The final output is a shattered dirty product which is a natural consequence of these adverse conditions. A large percentage of the coal also is entirely lost.

The block system of operation simply reduces to a minimum the coal removed in first mining. Large substantial blocks are left for pillar operations so that instead of pillar drawing being undesirable both as to cost and working conditions, the size of the blocks, and the protection they afford together with the concentration of labor rendered possible, make the work even more attractive than development from every standpoint. After a block system has been once established the major portion of the production from the mines is derived from the removal of the pillars. Development work easily takes care of itself and only 25 to 30 per cent of the coal is produced in this operation. Drawing of pillars is, of course, done by undercutting with two or more men working on each pillar.

## ALL PASSAGES ARE DRIVEN ENTRY WIDTH

In the accompanying illustrations, Fig. 1 shows a block system differing from many old room-and-pillar projections in the width of the centers only. This plan shows all work driven entry width, blocks 84 ft. each way with 24 per cent of the solid coal removed in first mining. This plan is particularly adaptable to the Pittsburgh bed, although under other conditions the rooms can be widened out providing the centers are likewise extended so as to give blocks of maximum size. The plan shows all rooms driven to their limit as soon as they have been necked. It will be found, however, that after getting a long break line estab-

lished, room development can be retarded by skipping two or three rooms occasionally and driving them only when required for the break line.

In Alabama I have seen mines employing 800 men of whom 12 were employed in drawing pillars that were badly squeezed. I have seen mines in that state 45 years old still working by the original methods under which they were started, that is taking 50 per cent of the coal in first mining and working out quarter-mile squares before starting pillar drawing. This results in the mines spreading over enormous

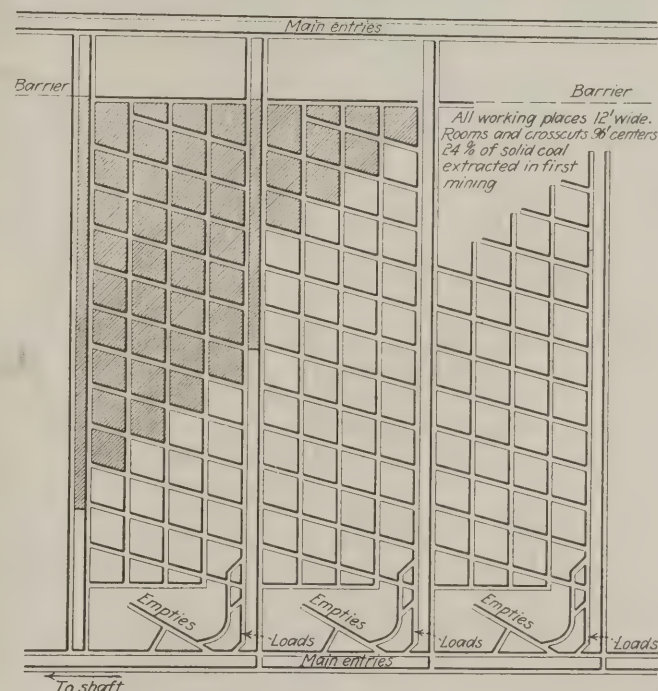


Fig. 1—A Mine Developed on the Block System

This plan differs from the ordinary room-and-pillar mine only in the width of rooms and the distance between centers. All passages are here driven entry width and the resulting blocks are 84 ft. each way. Only 24 per cent of the coal is removed in first mining, leaving the other 76 per cent for pillaring operations.

areas, four to five miles from the opening, while at the same time a large percentage of the coal is lost.

The principal objection to the block system in that region is that it is new and unfamiliar not only to the loaders, mostly negroes, but to the foremen as well.

Again in West Virginia mines may be seen that have been worked out to the extent of 70 to 75 per cent and then abandoned because it had become dangerous to draw the pillars. Such properties are sometimes purchased by a neighboring operation, in order to secure the villages that have been built on them, as well as to get the equipment installed.

An advance pillaring block system is shown in Fig. 2. This is well adapted to a comparatively flat bed and mechanical haulage because all pillar coal must be hauled parallel to the direction in which the butt entries



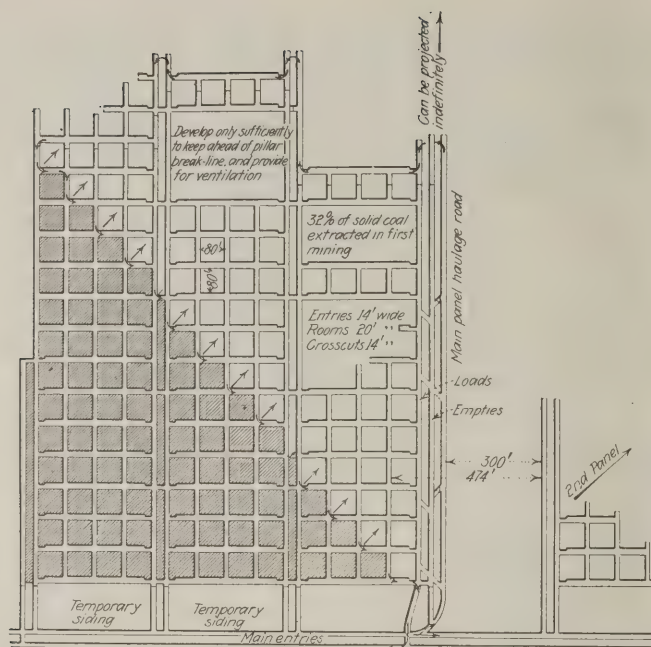


Fig. 2—Block System Particularly Adapted to Mechanical Haulage

This plan is especially adapted to comparatively flat beds. Rooms are driven 20 ft. wide on 100-ft. centers, giving blocks 80 ft. each way. First mining yields 32 per cent coal recovery. All pillar coal is hauled in a direction parallel to the butt entries.

are driven. This plan shows 20-ft. rooms and 80-ft. blocks with 32 per cent of the coal removed in first mining. However, for use in the Pittsburgh bed, entry width for all passages would be preferable.

In this plan efforts have been made to establish a break line as shown, after which development becomes secondary, the principal production from each panel being secured by concentrating on the removal of the line of pillars. Material such as track, etc., is continually moved forward as the break line advances and new sidetracks are constructed along the main panel haulage road. The barrier along this roadway not only provides protection while advancing but will furnish working places when the panel is finished and the chain pillar is ready to retreat. Some companies are projecting these panels a distance of 5,000 ft. or more.

A few of the many methods employed in removing blocks is shown in Fig. 3. The size of the blocks them-

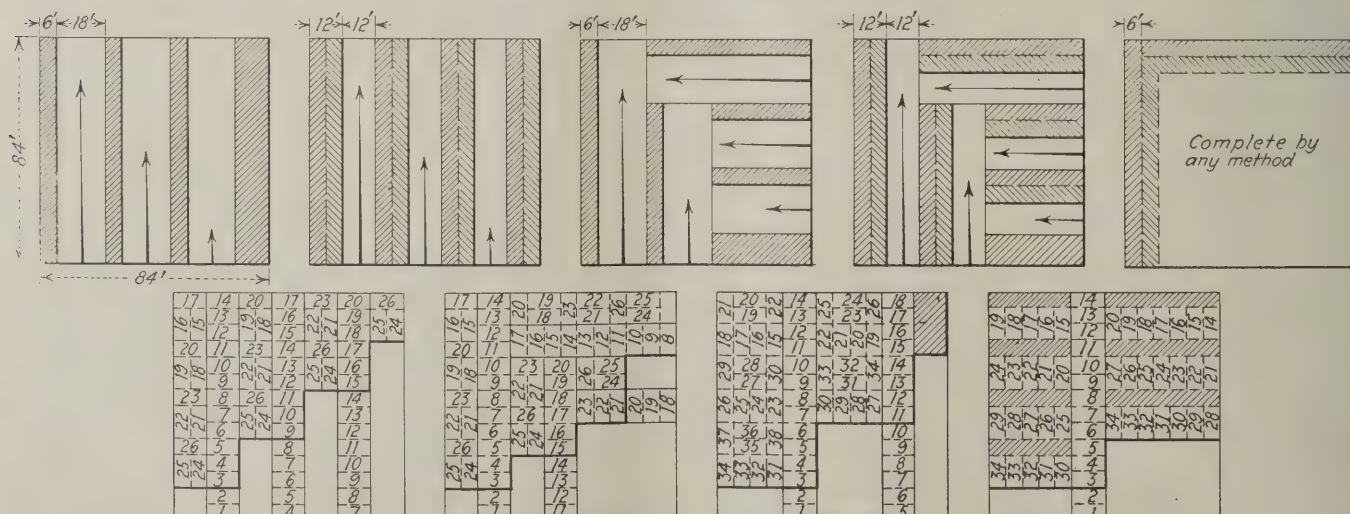


Fig. 3—One Method of Drawing Block Pillars

These pillars because of their size render the mine secure from squeeze, and any ordinary method of extraction can be followed with safety. Undercutters may be employed in pillar drawing to advantage.

selves makes the pillar operations secure from squeezes, safe for any reasonable method of pillar extraction and the work desirable for undercutting. These considerations form the chief arguments favoring this system.

For purposes of comparison with the block system, Fig. 4 shows the survey of a typical West Virginia "snowbird" opened during the war with a two-mile truck haulage to a private railroad siding. This mine produced 100 tons daily. The pillars will remain where they are shown.

Many of the largest companies in both West Virginia and Pennsylvania long ago changed to a block system. In Pennsylvania many mines have projections showing 100-ft. blocks, these being permitted by the mining law. The major portion of the tonnage, however, comes from smaller operations which have not altered their methods to any appreciable extent, and are hoping for

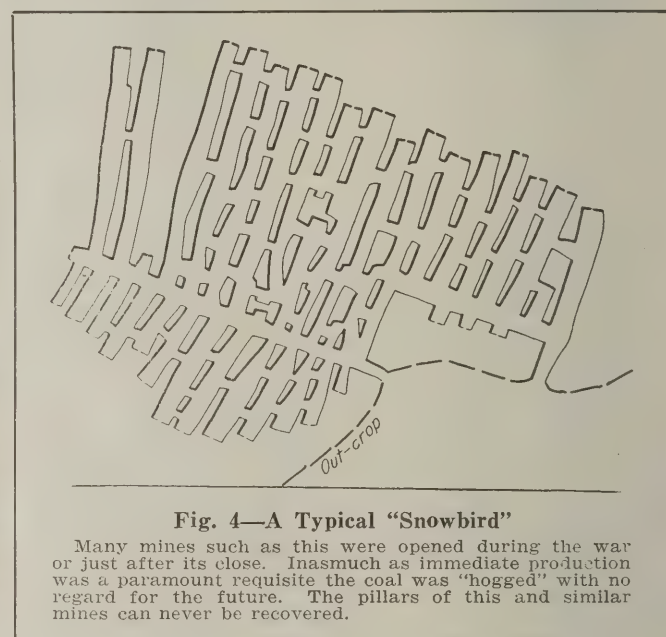


Fig. 4—A Typical "Snowbird"

Many mines such as this were opened during the war or just after its close. Inasmuch as immediate production was a paramount requisite the coal was "hogged" with no regard for the future. The pillars of this and similar mines can never be recovered.

another increase in prices which would allow them to withdraw standing pillars. When such a time arrives, however, the management may be so engrossed in retaining its labor and increasing its production that developments will be pushed still further and the next season will find the same old area of dangerous pillars.



# British Experiment with Bituloid as Dust Layer

Limited Trials Indicate Possibilities of Allaying Mine Dust with Colloidal Oil—Cannon Shots Into a Coal-Dust Cloud Fail to Ignite Dust Thus Treated—Further Experiments Appear Warranted

COAL DUST has long been recognized as a potent factor in mine explosions and one which contributes largely to their violence. Much effort has therefore been directed toward preventing coal dust from propagating an explosion. In general two means have been adopted to this end namely, (1) neutralizing combustible coal dust by mixing with it an incombustible stone dust and (2) wetting down accumulations of fine coal particles with various liquids the most common of which is water.

Unfortunately, probably because of the high surface tension of water and the somewhat greasy nature of coal, especially when in a finely divided state, water will not readily permeate a mass of coal dust. Furthermore water will in time dry out of dust leaving it free to be raised in the air almost if not quite as readily as if it had never been treated or wet down. In order to overcome this difficulty various

other substances have been added to or mixed with water to decrease its surface tension and increase its dust-penetrating ability. Soap, water glass, carbolic acid and various other substances have been tried for this purpose. All in varying degree reduce the surface tension and permit a more rapid infiltration of water into dust accumulations. Many of these substances also, upon drying, leave the coal dust so caked that it cannot be thrown into a cloud upon the initiation of a gas explosion.

Anyone who has observed the effectiveness of oil in laying the dust of a country road can readily appreciate that when applied to the coal dust of a mine it acts in a manner quite different from either water or stone dust. Strangely enough certain oils penetrate coal dust more readily than does gasoline and do not dry out for a long time. Such an oil possesses the highly desirable quality of seeping through the dust to the surface where it tends to catch and hold any other fine particles that may be floating in the air. Thus air in traversing a mine passage that has been treated with, say, a bituloid solution is purified rather than contaminated as it would be in traversing a passage that has been rock dusted.

Prof. Henry Briggs and Norman H. Wales recently presented a paper on the subject of "Colloidal Oil (Bituloid) as a Medium for Laying Coal Dust," before the South Wales Institute of Engineers. Some of the "high lights" of this paper are as follows:

The dominant factors governing the ability of a

liquid to wet down coal dust are the size of the dust particles, the surface tension of the liquid and some relationship not yet determined existing between the constituents of the liquid and of the dust. Of these the most important is surface tension.

Prof. W. M. Thornton in 1911 advocated the use of a liquid that served as a cement-like binder, but it is now believed that greater effectiveness can be attained

by employing a liquid that does not cake or cement the dust together but which dries with difficulty keeping the surface of the dust in a sticky or "tacky" condition. Bituloid, which is a heavy road oil intended originally for use on the surface, possesses the quality of remaining plastic for a long time. It readily seeps through dust deposits and keeps the surface moist thus quickly catching and holding any additional dust that may come in contact with it.

Bituloid is a milk-like substances consisting of:

Mexican bitumen, 15 to 20 per cent; green tar oil, 30 to 35 per cent; oleic acid and caustic soda, 1 to 2 per cent and water, 48 to 49 per cent. The ingredients of this mixture are so minutely divided and thoroughly mixed that they form a true emulsion the particles of oil and bitumen remaining in permanent suspension. In treating roads on the surface it is customary to add 19 parts of water to each part of bituloid, the resulting mixture thus containing about 2½ per cent of oil and bitumen. A stronger solution appears desirable for use on coal dust, and in most of the experiments performed with this substance a 10 per cent solution of oil and bitumen was employed.

Experiments thus far conducted with this material would seem to indicate that in application a coarse spray is preferable to a fine one. Furthermore the liquid should, if possible, be projected against the mine surfaces with appreciable force if best results are to be expected. If the mine passages are already well covered with coal dust two or three applications of bituloid in rapid succession may be necessary in order to bring the surfaces of the passage to the proper condition. Cleaning the surfaces and removing the dust present will facilitate the bituloid treatment and make more than two applications unnecessary as an initial treatment.

Once adequately treated most mine passages can be kept in proper condition by comparatively infrequent applications. The interval between treatments will, of course, depend on the rate of dust deposition and the drying power of the air current traveling. It is



estimated that one application in six weeks will be ample in most cases. The expense of laying dust by this means, of course is confined to the outlay for the material itself and the labor entailed in its application. The investment in equipment is small and there is no fixed charge for a preparation plant as with rock dust.

Several tests have been made with this material at various places. At the Eskmeals experiment station the floor of the experimental gallery, which is 200 ft. long and 7½ ft. in diameter was thickly strewn with coal dust. One half this length was then treated with a bituloid solution containing 5 per cent of oil and bitumen. The ends of the gallery were then boarded up and allowed to stand for three weeks. At the expiration of this time the boarding was removed, and it was found that the liquid had thoroughly wetted the dust, the surface still displaying an appreciable degree of adhesiveness. Dust readily was raised by the feet of the observers when traversing the portion of the tube where the material was untreated, but none was raised where the dust was bituloided.

#### EFFECT OF SPRAYING LASTED THREE WEEKS

At the Annesley colliery in Nottingham, England, two lengths of steel-timbered heading, 308 and 105 ft. long respectively and located near the downcast shaft bottom were treated on Oct. 6, 1922, with a bituloid solution containing 5 per cent of oil and bitumen. The volume of air traversing the heading where these applications were made was 32,544 cu.ft. per minute, the average saturation of this air being 74 per cent.

The longer section received a second dressing on Oct. 28. An inspection was made on Nov. 3, and it was found that the floor dust was damp and could be squeezed into a cake in the hand. The dust on the sides of the heading formed a plastic layer that required a knife for its removal. Under these conditions the effect of double spraying lasted three weeks after which freshly deposited dust was no longer retained, and another application of bituloid was necessary. In untimbered roadways carrying a high velocity of comparatively dry air the results obtained were not as satisfactory, the effects of an application disappearing in a few days, rendering retreatment necessary.

Tests of this method of laying dust were also conducted about the same time at the Bestwood colliery, in Nottinghamshire, England. These likewise indicated that a close connection existed between the drying power of the air current and the length of time that might logically elapse between applications of bituloid. In one haulage road 11 ft. wide and 6 ft. high carrying 33,000 to 35,000 cu.ft. of air per minute at 73 deg. F. and 90 per cent saturation, surfaces covered with stone dust that had been previously applied, when sprayed with 2 gal. of 5 per cent mixture per linear yard of heading, remained in good condition for a month, the floor being the first surface to show need for retreatment. During this time about 800 tons of coal was transported through this passage daily.

Early in December, 1922, a trial of bituloid was made in the Llanbradach colliery. This test was conducted on an intake haulage road. The velocity of air in this passage was 300 ft. per minute, the temperature 53½ deg. F. and the humidity about 80 per cent. The section selected was 240 ft. long. A part

of this distance was arched, part timbered and the remainder supported by "horse-shoe girders" backed by wood lagging. A large quantity of dust had collected on the roof and sides. That on the floor was kept wetted down by means of water sprays installed at intervals.

Without cleaning this passage and while the floor was wet an application of 20 per cent bituloid was made with a pressure pump. Under the circumstances no great success was anticipated. On examination fifteen days later, however, the treatment appeared to have been effective on the roof and sides but not on the floor.

Tests at the Newbattle Colliery, Midlothian, Scotland, conducted during November and December, 1922, gave the following results: (1) Bituloid caught and bound coal dust into a mass of such a character that it could hardly be expected that it would be thrown into a cloud in the air by any explosion wave however forceful. (2) It reduced the quantity of dust floating in the air. (3) A 10-per cent mixture of bituloid appeared to be most suitable. (4) A single application on dusty surfaces appeared to be of little value; at least two preliminary dressings were needed to afford the desired adhesiveness. (5) An effective cleaning should precede bituloid application. (6) Surfaces to which dust most readily adheres such as wood, are those to which bituloid also most readily adheres. (7) On the intake haulage road, where the tests were conducted, the surfaces retained their stickiness for over a month.

One objection advanced to the use of any material such as soap or bituloid for laying dust in mines is that such material unquestionably adds to the combustible content of the dust. As a matter of fact, however, a mixture of bituloid and coal dust no matter how thoroughly it may be dried out never attains such a condition that the dust could be raised in a cloud. It is believed therefore that an explosion of the mixture is thus rendered impossible.

#### BITULOID PREVENTS COAL-DUST IGNITION

In order to ascertain definitely by trial whether an application of bituloid solution would prevent the ignition of coal dust a series of experiments were made in a short narrow drift of the Straiton limestone mine, of the Shotts Iron Co., in Midlothian, Scotland. Obviously such tests could not be prosecuted in an operating coal mine. It was of course necessary to make such arrangements that ordinary untreated coal dust could be exploded without fail before trials were begun on treated dust.

Impressions made upon the eye were not reliable indications of the intensity of the explosion produced. The force of the blast of air created was more trustworthy, but the impression made on a photographic plate was more satisfactory still. A camera accordingly was used in recording results.

In order to ignite the dust a cannon with a 1½-in. bore loaded with 1 lb. of 2 oz. pellets of black powder and stemmed with 2 oz. of coal dust was fired electrically into the cloud of dust created by a "cloud raiser" placed in front of it and fired about one second previously. This cloud raiser was a lump of clay with a small vertical hole in its top and loaded with a 2-oz. pellet of black powder stemmed with 2 oz. of coal dust. The cloud raiser was placed 3 ft. in front of the cannon. With this arrangement 7 to 8 lb. of coal dust



distributed on shelving along the sides of the drift could be ignited time after time.

In order to simulate as nearly as possible the condition of maximum risk, the dust raiser and cannon were not fired until after bituloided surfaces of the drift had been sprinkled with a greater quantity of coal dust per unit area than would normally be deposited upon them between treatments and a certain time interval had been allowed to elapse. As no means could be found for distributing the dust evenly and uniformly hour after hour, it was all distributed at one application. At least a full day (24 hr.) was then allowed to pass before the cannon was fired.

The results of this procedure were as follows: On the first day the drift was cleaned and the surfaces strewn with 8 lb. of coal dust after which 6 gal. of a 10-per cent bituloid solution was applied. On the third and seventh days the dust was again sprayed with a bituloid solution of the same quality after which an additional 4 lb. of coal dust (making a total of 12 lb.) was distributed. This treatment was intended to simulate that administered to a dusty road where three applications of bituloid would be employed.

On the eighth day the surfaces were examined and it was found that the bituloid solution had absorbed the dust, with the exception of a little here and there. The surfaces were "tacky." The cloud raiser and cannon were then fired in the usual manner, but the photographic plate showed that no dust ignition took place.

On the sixteenth day the surfaces were again examined and found to be still adhesive. More coal dust, 4 lb. of it, making 16 lb. in all, was distributed. On the seventeenth day it was found that the bituloid had absorbed the additional dust. The cloud raiser and cannon were again fired, but the photographic plate once more showed no dust ignition. Four more pounds of coal dust then were distributed, making a total of 20 lb.

Again on the twentieth day the surfaces were examined and found to be adhesive. Once more the cannon was fired, but the photographic plate showed no dust ignition.

This series of experiments was terminated by a collapse of the wall along the side of the drift. This wall was eventually rebuilt, and the drift again rendered accessible. The surfaces that remained undisturbed were inspected on the seventy-eighth and ninety-eighth days after the first application of bituloid. Sluggish ventilation and high humidity were favorable to the slow drying of the bituloid. The dust remained closely bound in a soft matrix even fourteen weeks after the first treatment.

#### FURTHER EXPERIMENTATION APPEARS WARRANTED

These experiments, of course, were not conclusive, nor were they intended to be. Thorough demonstration can only be made by a long series of tests under widely varying circumstances. The results thus far obtained, however, would appear to warrant the initiation of such experiments.

This general method of allaying mine dust, although nothing positive concerning it may yet be said, would appear to possess certain more or less definite advantages and disadvantages. These might be briefly enumerated as follows: Rockdusting is the most efficient method of preventing dust explosions that has

yet been thoroughly demonstrated. This practice, however, particularly on roads that are seldom cleaned tends toward a pollution of the mine air rather than toward its purification. Working or walking in places encumbered with dry dust of any kind is unpleasant and may expose the men to dust diseases. Bituloid, repeatedly applied to dusty mine passages that are not systematically cleaned, in time will render such places almost impassable. Though a bulk sample from the floor, ribs, roof and timbers of a place that has been rockdusted may show 50 per cent of incombustible matter, inasmuch as the coal dust is deposited on top of the stone dust, the outermost layer or that first affected by an explosive wave will undoubtedly contain a higher percentage of combustible material. Bituloid impairs mine illumination instead of improving it. On the other hand its use would check, if it did not entirely prevent, the growth of fungi on mine timbers.

#### BITULOID OPENS WIDE FIELD OF POSSIBILITIES

Three other questions involved in the use of bituloid can only be determined from experiment or from experience. These include the effect, if any, of a current of air of high drying power; the effect of bituloid on the weathering of shaly rock, and the effect of spraying this material on the insulating cover of power cables. At the Annesley colliery some samples of shale were dipped in water and others were dipped in bituloid solution, after which they were all allowed to dry. Those dipped in water crumbled in a short time, but the others did not disintegrate.

As bituloid or some similar oil product appears to open a wide field of possibilities it would seem that some careful experiments as to the effects of its application would be fully justified. It is only through careful test that the possibilities and limitations of any process or material may be determined with accuracy.



This Big Chunk "Just Happened"

They didn't try to mine this 2 ft. 6 in. x 2 ft. 9 in. x 4 ft. chunk weighing approximately 2,200 lb. It just happened. The Pittsburgh coal bed (this piece came from the Pittsburgh Coal Co. Montour No. 9 mine, on the Montour R.R.) is noted for its well defined cleavage faces and butts at right angles thereto. This lump came down in a room face just as it is shown in the picture and this particular chunk has within itself no cleavages at all, although the surrounding coal is characterized by the usual rectangular faces. The man on the right in the picture is James Davidson, superintendent of Montour No. 9.





*Thew Shovel in Hanna Mine*

## They Are Solving Coal-Loader Problems at Hanna

Wyoming Thick-Seam Conditions Seem Ideal for Loading Machines Yet Heavy Time Losses Cannot Be Avoided—Small Units Save Money Even at 104 Tons a Day—Single Track with Switch Proves Best for Rooms

EVERY mine offers its own peculiar obstacles to mechanical underground loading. And in every one, when these problems are worked out, machine loading pays. In the No. 4 mine of the Union Pacific Coal Co., for instance, where coal is 32 ft. thick, where roof conditions are good and there is no forest of timber to contend with, T. H. Butler, mine superintendent, once thought conditions were ideal for loading machines. Loading machines are having their opportunity—Joys and big Thews working in conjunction—yet the “ideal” conditions managed to yield a large crop of adverse circumstances which Mr. Butler described in a recent discussion before the Rocky Mountain Coal Mining Institute.

But in spite of the adversities the machines “earned their keep” during the first six months of this year, as Eugene McAuliffe, president of the company, revealed. He said the Thews loaded coal for 52.4c. per ton, a saving of nearly 28c. a ton over hand loading, and the Joys saved 11c. a ton. Together the saving averaged 25.2c. a ton; but it was Mr. McAuliffe’s opinion that neither type of machine could have done it alone. The Joys made it possible for the Thews to do their work so well.

The system at Hanna is for the Joy machines to take out the lower 8 ft. of the 32-ft. seam, in rooms 32 ft. wide and sometimes 800 to 1,000 ft. long. The Thews then load out the next 18 ft. above, the aim being to leave 6 ft. of top coal to hold the soft sandstone roof. This scheme looks admirable on paper, but the seam pitches from 14 to 17 deg., which introduces complica-

tions, for it takes a long time and a lot of effort to move the Thews from room to room. The rooms are driven on the strike and planes are used on the pitch. When faults are encountered, the planes are driven between the faults.

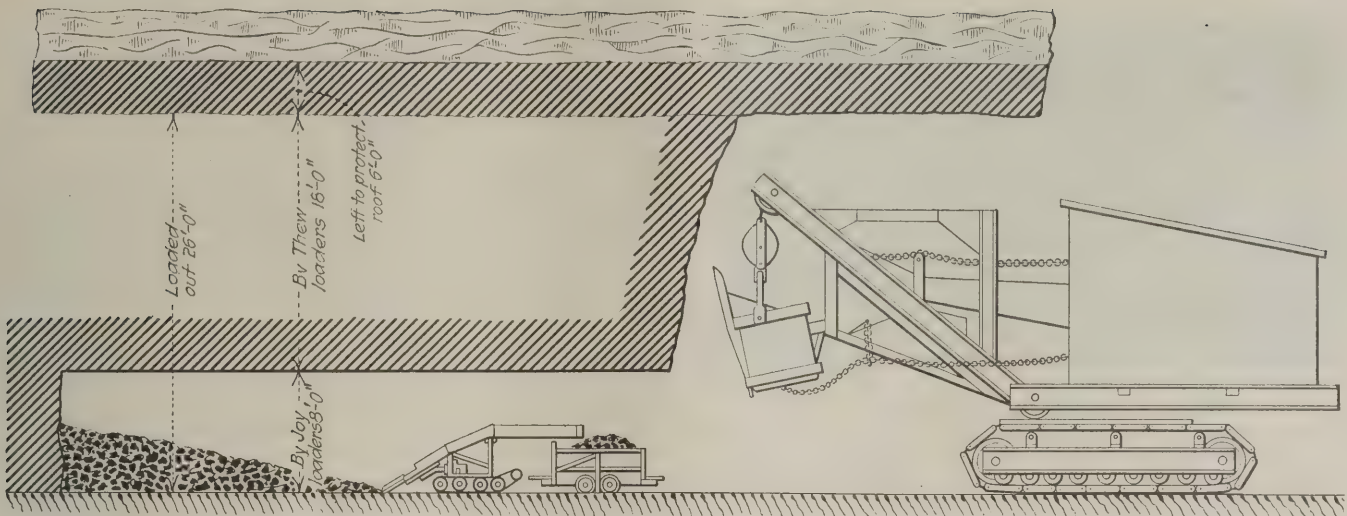
The Joys averaged during that six months only 104 tons a day per machine and the Thews but 140 because they could not be kept running steadily. Mr. Butler said the machines undoubtedly would load the coal if it were possible to keep them in coal all the time, but there are always many seemingly unnecessary delays to be overcome. Changing cars, breaking lumps, pulling coal loose from the face that a machine will not dig, repairing machines and the heavy time losses due to moving the machine on the heavy pitch have been the main difficulties.

In January, 1916, the company installed a Type 1 Thew shovel, equipped with a 1½-yd. dipper, and in July, 1917, it installed a Type 0 Thew, equipped with a 1-yd. dipper. In 1918 two additional Type 0 Thew shovels equipped with 1-yd. dippers were added, making a total of four Thew shovels for this mine.

“The introduction of these shovels,” said Mr. Butler, “caused the employees much concern, and, like all departures from the old methods of mining, met with the indifference of some and the open antagonism of others, so that for some time the results obtained were not satisfactory.

“However, in consequence of constant supervision and changes in the method of haulage the results obtained at present, though not entirely satisfactory,





The Loading System at Hanna No. 4 Mine of Union Pacific Coal Co.

In order to make room for shooting down a great pile of coal in front of Thew shovels, the bottom 8 ft. is taken out by Joes in rooms 32 ft. wide and of various lengths up to 1,000 ft., depending on local conditions. The next 18 ft. is loaded by the Thews and 6 ft. at the top is left to hold the roof.

are much better, and the production and costs are reasonably good. The Thew shovels in use are mounted on traction wheels with swivel axle and move in all directions by their own power. Though the weight of each is approximately 20 tons, they are not as cumbersome as one would think and they are easily operated.

"The method used in working these Thew shovels is to shoot the coal down ahead of them and maintain two tracks, two cars being used on each track, so that a shovel is loading on one track while the driver is changing cars on the other. When the place is finished the shovel is run back to the first crosscut by its own power, and lowered to the next room with block and tackle, the roof coal in the crosscut being shot down to a height of 16 ft. to allow the boom to pass.

"With better results from the Thew shovels the officials of the company soon realized that it was necessary to find some means by which rooms would be developed faster than mere human power could drive them, for otherwise the Thew shovels would soon exhaust the working places available. So in November, 1923, the company purchased two Type 4BU Joy loaders. These machines met with the same indiffer-

ence and antagonism from the employees as had the Thew shovels. For a time the results were discouraging, but for the past six months they have been better, and at present, though production and costs are not entirely satisfactory, they are, in my opinion," says Mr. Butler, "reasonably good.

"As I see it, the big problem of successful mechanical loading is transportation, and that means working out a system of haulage so that empty cars are at all times available at the loader, or, better still, the development of a system of sectional conveyors to take the coal from the loader at the face to cars or to a conveyor on the plane.

"The blasting of the coal also is a matter of importance in the successful operation of mechanical loading, for the coal must be loose and of a suitable size to be readily handled. In this respect we are somewhat handicapped, as the coal is of a woody nature, with no cleavage or fractures, and has no roof parting to shoot to in the advancing places, all of which makes it difficult to provide coal so loose and of such size as to be handled readily by the loaders.

"How to lay the tracks in the advancing places so as to keep the cars as close to the loaders as possible also is a problem. It seems to us that the fewer tracks

Seven-Month Record of Thew Mechanical Loader

Month	Tons Loaded	Delays Hours	Days Worked	Average Daily Tonnage	Number Loaders Working	Number of Men in Crews	Number Tons per Man	Tons per Man, Hand Loading	Remarks
Jan.....	12,904	124	23	561	4	12	46.7	14.0	
Feb.....	11,659	70	21	555	4	12	46.2	13.6	
March.....	7,907	79	13	608	4	12	50.0	15.6	
April.....	4,677	18	11	425	2	6	70.0	16.3	
May.....	3,914	30	8	489	3	9	54.3	14.8	
June.....	5,656	54	9	628	4	12	52.3	13.3	
July.....	8,224	91	13	632	4	12	52.6	13.0	
Totals...	54,941	466	98	3,898					

Average daily tonnage per loader, 140 tons.

Seven-Month Record of Performance of Joy Mechanical Loader

Month	Tons Loaded	Delays Hours	Days Worked	Average Daily Tonnage	Number Loaders Working	Number of Men in Crews	Number Tons per Man	Tons per Man, Hand Loading	Remarks
Jan.....	4,643	77	24	201	2	8	25	14.0	
Feb.....	4,581	55	21	218	2	8	27	13.6	
March.....	2,810	37	13	216	2	8	27	15.6	
April.....	2,085	39	11	190	2	8	24	16.3	
May.....	1,772	20	8	221	2	8	27	14.8	
June.....	2,069	29	9	230	2	8	28	13.3	
July.....	2,666	42	13	205	2	8	25	13.0	
Totals.....	20,626	299	99	1,481					

Average daily tonnage per loader, 104 tons.





**Joy Loader in the Hanna Mine**

The Joy machine is used to load out the big 8-ft. undercut in the mammoth 32-ft. seam, thus preparing the way for the surface-type Thew shovel which loads out 18 ft. of the rest of the coal. The Hanna bed dips 14 to 17 deg. and the delivery of cars is thus greatly hampered, but the shovel nevertheless makes a saving.

used the better. Our experiences have taught us that by keeping a 5-car parting 25 or 30 ft. from the face

and by using a single track from parting to face we get better results than by using two tracks, the loader crew pushing the loaded car from the machine to the parting and the empty car from the parting to the loader.

"For each Thew shovel we have a crew of three men, one operator and two trimmers, one of the trimmers shifting the cars from the shovel to the plane parting. For each Joy loader we have a crew of four men, one operator, two trimmers, and one driver. I notice in the mining journals that many operations have a crew of two men on Joy loaders, but owing to large lumps that have to be broken and the half loosened coal that has to be pulled off the face, our production from loaders would decline if we reduced the size of the crew.

"Our production from the four Thew shovels and the two Joy loaders in use will average 50 per cent of the output of the mine. The attached tabulated statements show the results being obtained by the use of mechanical loaders."

## Alberta Coal Field Soon to Be Opened

**P**ART B of the Summary Report of the Geological Survey of Canada, for 1923, just issued, contains an account of a preliminary investigation of the coal deposits along the Smokey, Hay, and Berland rivers, in northwestern Alberta, by J. MacVicar. Though this investigation is admittedly of only a preliminary nature, it gives a large amount of useful information about a region that, when opened by railway facilities, is likely to prove one of the most important coal areas in Canada. The investigation takes into consideration a strip of land 80 miles in length and 8 to 10 miles in width at the southeastern end and 25 miles wide at the northwestern end, extending in a northwesterly direction from Brulé, 180 miles east of Edmonton. In this area the thickness of the coal measures average 3,000 ft., and the individual beds range from a few inches up to 56 ft. thick. The coal varies in grade from bituminous to semi-anthracite, the lowest beds, because of the greater pressure to which they have been subjected, contain the higher carbon content.

These coal measures belong to the Kootenay formation, and where worked are noted for their evenness. Basing his calculations on this regularity and on the dimensions of the beds where they outcrop and at points at which they have been opened, Mr. MacVicar estimates that the area under consideration contains 10,000,000,000 tons of workable coal. The northwestern part of the area, which contains some of the thickest beds and is estimated to contain 7,000,000,000 tons of bituminous and 70,000,000 tons of semi-anthracite coal, has been withdrawn from location and is retained by the government as a national coal reserve.

At Brulé, in the southeastern part of the area, a considerable amount of development has been done and coal is mined for use on the Canadian National Ry. At this point the measures are 3,680 ft. thick and contain one 14-ft. and five 7-ft. beds. The top 700 ft. and the bottom 1,200 ft. of the measures contain no workable coal bed. Development in other parts of the area has been small, because there is no railway communication. The Canadian National has surveyed a route for a line to the north branch of the Hay River, which, with feeders, would give access to the first 40 miles northwest of Brulé. This road and also the Canadian Pacific

are considering branches into this district, which has been demonstrated to be one of the best agricultural regions in the Dominion. There is every reason to expect therefore that a railway will be built into this district in the near future.

## Salt Water to Avoid Fatigue

BY SIR JOSIAH COURT

**D**R. J. S. HALDANE has suggested that the cramps of mine workers in hot mines may be due to excessive loss of sodium chloride through profuse and prolonged sweating aided by the drinking of much water. In consequence experiments were made with a few miners who were given a weak solution of water when at their work. The proportion of salt was about  $\frac{1}{4}$  per cent or 10 g. in 1 gal. of water. The result was satisfactory and justified its use.

It occurred to me to try the use of salt at a colliery where the air temperature at the coal face was considered high. I interviewed six miners as they left the Warsop Main pit. The four places in which they had been engaged had temperatures varying from 79 to 81 deg. F. All the men consented to take my advice and put salt in the drinking water that they brought to the mine. After a month's trial they all said they were less tired than usual after their work was over. One man not only said he was less fatigued but less anxious for his usual nap after his return home. The wives declared their husbands were more energetic when they came off shift. Another man said that attacks of cramp in his leg had ceased to trouble him since using salted water.

The boilermen at Warsop Main were working in an average air temperature of 96 deg. F. (dry). On my recommendation they added half a teaspoonful of salt to every quart of water they drank. They usually consumed four pints daily. Twelve days later I saw them again, and every man was pleased with the experiment. They all stated that when they reached home in the evening they felt less tired than they had been when drinking unsalted water.

From a paper read before the Institution of Mining Engineers, London, Oct. 2, 1924. (Eleventh Report to Committee on "The Control of Atmospheric Conditions in Deep and Hot Mines".)





## News Of the Industry



### Coal Stock Report Again Emphasizes Need of Distribution Data

Features Surprising to Trade Reveal Lack of Statistics Comparable with Those on Production—Demand for Figures Becoming Insistent—Interesting Light Cast on Industrial Conditions

By PAUL WOOTON  
Washington Correspondent of *Coal Age*

Correspondence reaching Washington shows that there was general surprise in the coal trade and among consumers that the country's stocks should have been 47,000,000 tons on Sept. 1, as shown by the report issued jointly by the U. S. Geological Survey and the Bureau of the Census. In some quarters there is a disposition to doubt the returns. Those who hesitate to accept the figures in the stock report base their attitude on the fact that production was low during April, May and June—lower than in those months of 1921—yet the stock report shows a reduction of only 15,000,000 tons since Jan. 1 and 4,000,000 tons since June 1.

The explanation of the apparent contradiction between the production and stock figures is that consumption of coal has been at a low ebb. In fact, it had fallen to a lower point than had been realized.

The stock report presents conclusive evidence that the country has been going through a period of dull business which almost could be characterized as a depression. In the iron and steel industry, for instance, which affects coal more than do many light industries, the depression was severe. The output of pig iron in July was the lowest in any month since February, 1922. To be specific, production of pig iron in July was 1,785,000 tons. This was barely half the rate of production in July, 1923, when it was 3,678,000 tons. Even the July, 1922, production was 2,403,000 tons.

#### Leaders Mum on Eve of Election

Naturally on the eve of an election business leaders are not saying much about the depressed state of industry, but the figures in the stock report tell an interesting story.

In the first quarter of the year the output of iron and steel was well up around the level of 1923, a very prosperous year, but beginning in April it began to tumble "like Niagara," to use an expression often employed by Dr. Garfield. In so far as the iron and steel industry is concerned it certainly sank to depression levels in midsummer. It is now moving upward at an encouraging rate, but has not recovered to the point where its consumption of coal is heavy.

One of the reasons why the present period of sluggishness in business has passed without much comment is that business has been spotty. Building and certain other activities have been brisk, but the heavy industries that are the large consumers of coal have been in the doldrums. They have been conspicuously absent from the coal market.

It is noticeable that the changes in coal stocks since Jan. 1 reflect closely the trend of general business. From Jan. 1 to June 1 the liquidation of stocks went on rapidly, but from June 1 to Sept. 1 it was very slow. The stock report shows clearly that the severe depression in coal was not due merely to undigested stocks held by consumers, but was due mainly to the fact that the country was passing through a period of depression. The coal market would have been dull even if there had been no stocks. The fact that there is a heavy reserve still to liquidate is discouraging to the producers of coal and some are counseling curtailment of production, which has been rising sharply for six weeks. There can be no doubt that this would be good business, from the standpoint of the coal operator, but from the consumer's point of view it is regarded apparently as good business to continue to buy coal at present prices so as to maintain the reserve.

#### Coal Reserves Comfortably Large

The stock report shows that the country's reserve of coal is comfortably large. There is no prospect of a shortage this winter unless something unforeseen should occur. It would not be in the public interest for consumers to be lulled into a false sense of security and allow their stocks to fall below the danger line. There is increasing evidence, however, that American consumers at last have learned that ample reserves above ground constitute their best insurance against high prices.

Consumers of anthracite, however, are not displaying the same wisdom. Anthracite stocks for the most part still are in the hands of the retail dealers. The sudden advent of severe weather would wipe out these stocks quickly. Retail storage is designed for the gradual movement of a considerable portion of the coal handled. Stocks

### These Miners Know How To Cut Mine Costs

Twelve union miners who have been making \$12 to \$15 a day each by running the Crawford Coal Co. mine near Brazil, Ind., on a co-operative plan have been ordered by the district union organization to quit or be ejected from the union for 99 years. The union officials declared the men, by doubling up on jobs and otherwise reducing operating costs, were producing coal so cheaply that other operators could not compete with them.

now on hand are not sufficient to supply more than immediate needs. A run on this reserve might come over a wide area and make it impossible for the producers to supply all the coal needed on such short notice.

The appearance of the stock report, carrying with it a great surprise for the entire trade, emphasizes anew the need for distribution statistics that are comparable, at least, with those covering production. That the demand for such figures is becoming more and more insistent is indicated by the great amount of attention given the problem as applied to all commodities, at the meeting of the Eastern Division of the Chamber of Commerce of the United States in Washington.

### Coal Traffic at Cincinnati Breaks Record

As a coal-handling city Cincinnati is rapidly approaching the records established by Pittsburgh, if continued increases in interchange figures as regards coal loadings may be accepted as an indication.

Following the announcement several weeks ago that the highest previous interchange record had been passed, J. A. Morris, district manager of the American Railway Association, in his weekly letter to the Car Service Division at Washington last week reported a new high mark of 13,500 carloads of coal handled during the preceding seven days in the local terminals. This was an increase of 802 cars compared with the previous week. An increase also was reported in coal bound for lake ports.

Of the 17,336 empties interchanged during the week, 12,377 were open tops going to the mines. All coal loading roads except the L. & N. have been able to supply 100 per cent car equipment for the entire week.



## Coal Exporters Charged With Unfair Competition

The Federal Trade Commission charges unfair methods of competition in the marketing of coal to South America in a complaint issued against the Gano Moore Co., New York City, and the Gano Moore Coal Mining Co., Philadelphia, Pa. M. Rea Gano is named individually as a respondent in the citation, and as the president and active director of the two responsible companies.

The complaint alleges that the respondents in their conduct of their business in export trade have accepted orders and received payment from foreign customers for coal of a specified quality and quantity, to be delivered in several shipments at specified times, and wilfully or through negligence have caused to be delivered for the coal so ordered coal of a quality inferior thereto, and have failed to make deliveries in the quantities and at the times specified. On the contrary, the complaint states, deliveries of inferior coal have been made and in less quantities and at later dates than specified, the total amount being much less than the total quantity ordered, thereby engaging in unfair competition with competitors in the United States engaged in foreign commerce who bid on and furnish goods of the desired quantity and quality, and ship at the specified time. The respondents, the citation continues, bring into disrepute and injuriously affect the entire exporting trade of the United States, and unfairly injure all competitors who fulfill their agreements and undertakings.

### Tried to Raise Price

According to the complaint, respondents represented that they were unable to make deliveries under existing contracts although at the same time repeated offers were made to the same purchasers to ship larger quantities of coal of the same kind and quality but at greatly increased prices, also offering to ship under the original contract provided the purchaser agreed to pay an increased price and to enter into contract for additional shipments of coal at increased prices.

Further allegation of the complaint is that the respondents in order to defeat the purposes of alleged export regulations of the United States, which restricted the export of coal to a certain percentage of the contract quantity, proposed to the Central Argentine Railway, Ltd., that they enter into a fictitious contract for 200,000 tons of coal, the railway at the same time to receive a letter from respondents to the effect that the contract was in effect for but 50,000 tons. The railway refused to accept this proposal.

The methods employed by the respondents in the conduct of their business in export trade, according to the citation, have injured and damaged generally the reputation and the business of persons of the United States lawfully competing with respondents in export trade, and have brought such competitors into disrepute with purchasers in South America.

## Now the Athletic Mule

"I've been reading those 'bright mule' stories," says a mining man. "Let me tell you about an athletic mule I knew out in a thin-seam Iowa mine. I took control of a mine out there and was viewing it for the first time. I had noticed the mules all were about 14 hands high. In looking around underground I came to a place where a boulder in the roof stuck down right over the track, leaving a clearance of only 3 ft. 10 in. Not being able to figure out how a 14-hand mule could get through a place like that, I sat down to see. Pretty soon there came a little trip on the run. I'll be darned if that tall mule didn't just juke down and slip under that boulder like a dog goes under a fence, and away they went without a pause. I had to laugh. Show me any other animal 14 hands high that can do any such stunt! That's my 'bright mule' story."

What's yours?

## Fewer Mine Accidents Under His Régime, Says Pinchot

In an address at Erie, Pa., on Oct. 23, Governor Pinchot attributed the reduced number of mine fatalities and accidents in Pennsylvania during the past year to the economies and efficiency of his administration. The politically useful state employee has been dropped, he said, and jobs have been awarded to the efficient.

"The results speak for themselves," he said. "In the past, for example, many thousands of miners in Pennsylvania have lost their lives in cave-ins, explosions and the hundred and one sources of danger in the underground shafts."

"We have undertaken to reduce these accidents by eliminating the sources of danger. Better inspection all along the line has resulted in the saving of the lives of many of the miners. The statistics prepared by the Mines Department at Harrisburg conclusively prove that this department has rendered a service to the families of the miners that cannot be calculated in mere dollars and cents."

"There has been a steady and gratifying decrease in the number of fatal mine accidents. In proportion to hours worked, the year 1923 showed a considerable improvement over 1922, but 1924 has far outstripped any other year of the last decade in the decreased number of mine deaths. Thus in the first eight months of 1923, 388 men lost their lives in anthracite mine accidents. During the same period of 1924, 333 men were killed in the anthracite mines, or a reduction of 55 lives. Similarly, 293 men were killed in the bituminous mine accidents in the first eight months of 1923, while but 228 died in the soft coal mines in the same period in 1924. That represents a saving of 65 lives in the bituminous mines. Better inspection certainly aided materially in reducing by 120 the number of mine fatalities in a single year."

## September Soft-Coal Exports Second Highest of Year

Total exports of bituminous coal from the United States during September amounted to 1,502,829 gross tons, the second heaviest monthly shipments during the current year and an increase of almost 110,000 tons over August exports, according to a report by the Coal Division of the Department of Commerce. Exports to Canada, totaling 1,201,280 tons, increased by more than 150,000 tons over August exports and were exceeded only by July shipment to that destination.

Overseas shipments of bituminous coal during September, amounting to only 281,886 tons, compared with 335,671 tons in August, were the lowest of the year; in fact September is the only month in which overseas exports have fallen under 310,000 tons. The chief cause of the decline in these shipments is the fact that exports to Italy dropped from 89,040 tons in August to 33,590 in September. There were only two other European countries to which American bituminous coal was shipped in September, 27,067 tons going to France against 37,401 tons in August, while 1,100 tons went to Spain.

Important increases occurred in shipments to parts of Central America and the West Indies. Among these were exports of 10,278 tons to Barbados, 6,755 to Trinidad and Tobago, and 7,674 tons to the Virgin Islands, to which destinations no coal was shipped during August. Exports to Cuba, however, fell from 67,183 tons in August to 46,184 tons in September, and to the French West Indies shipments during September amounted to only 1,118 tons against 9,452 in the previous month.

Although shipments to Brazil during September amounted to 77,282 tons against 80,892 in August, total exports to South America increased, amounting to 94,223 tons against 90,389 in the preceding month. This increase was due to shipments of 15,660 tons to Argentina in September whereas there were no shipments during August. An unusual feature of the coal export trade was the shipment of 1,776 tons to Japan in September.

Exports of anthracite during September, when shipments were the second highest of 1924, were 327,322 tons against 257,090 tons in the preceding month, the increase being due to heavier exports to Canada, 321,282 tons going to that destination in September against 246,316 in August. Exports of coke from the United States during September totaled 41,804 tons against 42,308 in August.

The Illinois Coal Traffic Bureau, in a complaint filed with the Interstate Commerce Commission Oct. 27, attacks the rates on bituminous coal from southern Illinois and the Belleville groups of mines as being unduly preferential to western Kentucky, to the extent that the existing differentials are less than 50c. per ton over the southern Illinois rates and 85c. per ton over the rates from the Belleville group, on coal moving via the East St. Louis gateway.



## U. S. Anthracite Operators Visit European Mines

Much first-hand information about the methods pursued in mining under various conditions in England, Wales, Scotland, Belgium and Germany was gained during a trip of 55 days recently completed by S. D. Dimmick, vice-president and general manager of the Glen Alden Coal Co., and H. M. Warren, consulting electrical engineer of the same company, both of Scranton, Pa.

The visit of the Scranton mine officials to England was made at the invitation of Harry Walker, chief inspector of mines of Great Britain, who addressed a meeting of the Engineers' Club of Northeastern Pennsylvania in Scranton last May. Mr. Walker greeted his American friends upon arrival in England and prepared an itinerary for visits to the mines of England, Scotland, and Wales under his jurisdiction. The visitors found much to interest them, especially in the anthracite region of Wales.

### Welsh Mines Lined with Brick

Mr. Dimmick was impressed with the depth of the mines in Wales. He said the average shaft is from 1,600 to 2,000 ft. deep as compared with average depths of 600 to 1,400 ft. in the anthracite field of Pennsylvania. He also noted the use of bricks to line the shafts in contrast to the American practice of using timbers, and steel ropes as conductors for the cage in place of wooden guides. The absence of surface subsidences, which cause so much trouble to anthracite operators in Pennsylvania, also impressed the visitors. The depth of the veins from the surface practically obviate such disturbances. Many of the mines recover all of the timber, the visitors learned, by mining out all of the coal and dropping the roof.

In Brussels the Scranton operators visited mines at Liege and Charleroi. While in the Ruhr district the party made its headquarters at Cologne. Here they were able to inspect the Frederick Hinrichs mine, regarded by the Germans as the most modern of its kind in



Thomas Fraser

Assistant professor of mining engineering in the University of West Virginia, in succession to C. E. Lawall who has been designated acting head of the department. Mr. Fraser is a graduate of the mining department of the University of Illinois, where he studied under the late Prof. H. H. Stoek, E. A. Holbrook and A. C. Callen. He also was employed for four years on investigative work with the U. S. Bureau of Mines, principally in coal preparation and subsidence problems.

the world. Mines in Essen, Oberhausen and Duisburg, located in the occupied territory along the Rhine River, also were visited by Mr. Dimmick and Mr. Warren.

Several operators of German mines in Essen and Duisburg informed Mr. Dimmick that during the month of March, 1925, they contemplate coming to this country to spend several months on an inspection tour in the bituminous and anthracite regions. It is expected that they will come to Scranton, where they will be the guests of Mr. Dimmick. The director of the Gutehoffnungsuile mine, in the Ruhr, is already in this country on an educational trip. He is expected in the hard-coal region soon.

## Commercial Coal Stocks Up. Say Purchasing Agents

Commercial consumers of anthracite and bituminous coal on Oct. 1 had in their bins 52,468,725 net tons, according to the monthly survey of the National Association of Purchasing Agents. This is a decrease of nearly 11,000,000 tons when compared with May 1, but an increase of 1,143,725 tons when compared with the tonnage on hand on Sept. 1 of this year. The survey shows that the estimated production in September was 48,418,000 tons and the consumption 34,217,000 tons, as compared with 33,637,000 tons in August.

In its survey the association says that business increased a little in September over the previous month if coal consumption is a fair criterion by which to judge. It is significant, however, that the majority of large corporations used about the same tonnage in September as in August while the smaller ones showed an increase. The consumption of coal for heating industrial buildings during September amounted to 528,342 net tons, or 1.5 per cent of the total production.

## Assigned-Car Order Postponed Again

The effective date of the assigned-car order of the Interstate Commerce Commission, restricting and regulating the distribution to coal mines of privately owned cars and cars for railroad fuel, which was to have been Nov. 1, was postponed by the commission on Oct. 23 until Dec. 15.

The commission's decision in the case, made on June 30, 1923, held to be unjust the practice of railroads in assigning private cars and system cars for railway fuel to bituminous coal mines in excess of the ratable share distributed to bituminous coal mines upon their lines which do not receive assigned cars. After the issuance of the first order postponements have succeeded each other with monotonous regularity.

## Monthly Bituminous Coal Output in the United States in 1923 by States\*

(In Thousands of Net Tons)

State	January	February	March	April	May	June	July	August	September	October	November	December	Total
Alabama.....	1,902	1,629	1,902	1,676	1,747	1,677	1,621	1,741	1,643	1,793	1,671	1,456	20,458
Arkansas.....	135	101	100	86	86	97	104	116	126	126	116	104	1,297
Colorado.....	992	921	879	750	736	759	691	758	866	977	963	1,054	10,346
Illinois.....	9,256	7,938	7,576	5,983	5,666	5,386	5,284	5,973	6,424	7,014	6,416	6,394	79,310
Indiana.....	2,890	2,439	2,586	2,089	1,725	1,802	1,878	1,927	2,226	2,337	2,188	2,142	26,229
Iowa.....	613	542	551	404	391	383	365	438	474	523	523	504	5,711
Kansas.....	408	342	344	290	300	287	289	335	350	373	378	340	4,036
Kentucky.....	3,714	3,118	3,488	3,284	3,777	3,657	3,902	4,303	3,892	4,513	3,847	3,282	44,777
Maryland.....	239	202	235	211	207	203	176	194	164	159	144	152	2,286
Michigan.....	142	105	144	91	52	51	70	92	109	126	106	84	1,172
Missouri.....	381	316	271	240	247	238	242	268	296	316	300	288	3,403
Montana.....	361	317	309	172	187	163	171	219	275	370	340	264	3,148
New Mexico.....	317	233	239	241	253	221	218	216	229	259	253	236	2,915
North Dakota.....	220	147	153	63	64	60	60	90	109	163	143	114	1,386
Ohio.....	3,567	2,764	3,329	3,113	3,770	3,848	3,559	3,817	3,488	3,675	3,120	2,496	40,546
Oklahoma.....	271	245	247	200	200	208	202	241	263	273	293	242	2,885
Pennsylvania.....	14,911	12,300	14,620	14,356	15,685	15,656	15,332	16,370	14,517	14,170	12,222	11,741	171,880
Tennessee.....	585	505	532	491	529	491	470	517	483	529	481	427	6,040
Texas.....	112	93	87	80	94	91	99	106	104	117	117	87	1,187
Utah.....	478	382	306	282	323	385	363	365	417	546	458	415	4,720
Virginia.....	926	846	1,035	1,012	1,097	1,038	998	1,090	991	1,039	886	804	11,762
Washington.....	326	307	333	145	193	193	152	204	236	305	293	239	2,926
West Virginia.....	8,310	7,170	8,501	8,272	9,826	9,688	9,938	10,475	9,440	10,320	8,359	7,601	107,900
Wyoming.....	817	621	611	472	483	452	477	672	669	829	750	722	7,575
Other states a.....	30	27	33	25	22	20	17	17	14	17	20	20	262
<b>Total</b>													
bituminous production...	51,903	43,610	48,411	44,028	47,660	47,054	46,678	50,544	47,805	50,869	44,387	41,208	564,157

\* According to final estimates by U. S. Geological Survey.

(a) Includes Alaska, California, Georgia, Idaho, North Carolina, Oregon and South Dakota.



## Delay of Assigned-Car Order Arouses Producers

The action of the Interstate Commerce Commission in delaying until Dec. 15 the effective date of its order abolishing the use of assigned cars in the procurement of railroad fuel is being criticized widely. There is a general desire in the coal trade to have the uncertainty removed. In some quarters the commission is accused of lacking the courage to put its order into effect in the face of the violent opposition which it aroused among the carriers. It will be recalled that the carriers were so certain that the commission would not abolish assigned cars that they made only a perfunctory effort in opposition to the proposal when the matter was first brought before the commission.

The dilatory tactics of the commission have so aroused some of the producing interests that inquiry has been made as to possible legal steps to require the body to express itself. While there is no statutory way of requiring the commission to take action, it is thought that just as effective results can be obtained by a Senate resolution inquiring into the causes of recurring postponements.

A probable explanation of the delay is thought to be that the commission is closely divided on the questions involved in the matter of assigned cars and mine ratings. The postponements, some think, are being ordered in the hope that some of the differences may be smoothed out.

The coal consumption of various industries as shown by the returns of the 1923 census of manufactures, now being issued, include the following: Rubber products, 544,105 tons; manufacture of steam and electric railroad cars, 44,630 tons; stoves, 94,783 tons; pianos, 102,108 tons; haircloth, 3,291 tons; manufacture of gas machines, gas and water meters, 24,120 tons; watches, 38,929 tons; grindstones and pulp stones, 10,884.

## Six Hard-Coal Firms To Be Consolidated in \$20,000,000 Company

*Special to Coal Age*

Scranton, Pa., Oct. 27.—A twenty million dollar merger of coal properties in Luzerne and Lackawanna counties will be consummated here within the next few days, according to information from Frank W. Childs, of New York, who is back of the biggest consolidation plan yet attempted in the anthracite region. A syndicate of bankers of New York City are understood to be part of the combine seeking control of the collieries. The following companies, according to Mr. Childs, are included in the merger: Kingston Coal Co., Grand Tunnel Coal Co., at West Nanticoke; Jermyn Coal Co., Old Forge; Midland City Coal Co., of this city, and the West Ridge Coal Co., of this city with the Carbondale Coal Mining Company of Carbondale.

The Kingston company and Jermyn company properties are the largest listed in the combine. The former company with coal titles will sell for \$6,000,000, according to the option, it is said, and the latter company will be bought for \$8,000,000 if the option is taken up. The Grand Tunnel Coal Co. is another large corporation in the lower section of the hard-coal field. The Midcity and West Ridge collieries are known in mining circles here as excellent properties. Figures on the estimated coal acreage involved in the transaction were not made available, as detailed information regarding the collieries is not being given out for publication.

It is understood that Mr. Childs has handled virtually all of the details and obtained a majority of options held by the syndicate. For some months back experts have looked over the properties included in the list, together with a number of companies not in the combination. Most of the options expire this week and a definite announcement of whether or not the merger will be put through will be made before the end of the week. Originally, it is said, the

## Coal Mining Institute Balloting On

Official mail ballots have been sent out for the election of officers for 1925 of the Coal Mining Institute of America. The candidates are as follows: President, A. C. Callen, Urbana, Ill., and Nicholas Evans, Johnstown, Pa.; vice-presidents (three to be elected), J. M. Armstrong, Pittsburgh, Pa.; A. C. Fieldner, Pittsburgh, Pa.; J. B. Hanford, Morgantown, W. Va.; W. C. Hood, Uniontown, Pa.; Eugene McAuliffe, Omaha, Neb., and J. J. Rutledge, Baltimore, Md.; secretary-treasurer, T. P. McTigue, Pittsburgh, Pa., and H. D. Mason, Jr., Ebensburg, Pa.; managing directors (ten to be elected), Ralph Beerbower, Pittsburgh, Pa.; Denis Boyle, Johnstown, Pa.; D. R. Blower, California, Pa.; F. W. Cunningham, Somerset, Pa.; M. D. Cooper, Pittsburgh, Pa.; Charles Enzian, Windber, Pa.; J. H. Evans, Mather, Pa.; W. G. Fear, Indianola, Pa.; W. E. Fohl, Pittsburgh, Pa.; William Hart, Parkers Landing, Pa.; A. E. Holbrook, State College, Pa.; A. B. Kelley, Greensburg, Pa.; R. M. Lambie, Charleston, W. Va.; Lee Long, Dante, Va.; Richard Maize, Uniontown, Pa.; J. W. Paul, Pittsburgh, Pa.; William Rigg, Pittsburgh, Pa.; Edward Stridle, Pittsburgh, Pa.; S. A. Scott, MacDonald, W. Va., and Fred Vinton, Indiana, Pa.

deal contemplated the merger of some fourteen companies in Lackawanna and Luzerne counties, but a recent turn of events has reduced the number to six. As first contemplated, the consolidation included the von Storch, Legitts Creek, the Spencer and Nayaug companies. Mr. Childs said that the name of the proposed company would be the Consolidated Mining Co. The company will have its main offices in this city.

Plans for financing the deal have been worked out, according to those who have been in close touch with the progress of negotiations. The latest merger, if it is completed, will make the fourth and most important in the anthracite field in the space of a few months.

## Output and Value of Coal from Indiana Mines in 1923

(Compiled by U. S. Geological Survey)

County	Loaded at Mines for Shipment (Tons)	Sold to Local Trade and Used by Employees (Net Tons)	Used at Mines for Steam and Heat (Net Tons)	Made Into Coke at Mines (Net Tons)	Total Quantity (Net Tons)	Total Value	Average Value per Ton	Number of Employees				Average Number of Days Worked
								Underground	All Others	Surface	Total	
Clay.....	580,068	56,706	8,619	.....	645,393	\$1,394,000	\$2.16	585	208	297	1,090	100
Daviess.....	142,253	21,589	8,089	.....	171,931	364,000	2.11	197	81	39	317	105
Dubois and Perry.....	.....	7,351	104	.....	7,455	22,000	2.95	11	4	2	17	191
Fountain and Warren.....	.....	2,514	.....	.....	2,514	10,000	3.98	9	.....	.....	9	189
Gibson.....	506,235	15,495	20,470	.....	542,200	1,272,000	2.34	707	263	86	1,056	100
Greene.....	2,309,237	55,690	28,395	.....	2,393,322	5,767,000	2.41	1,731	633	548	2,912	121
Knox.....	3,404,670	44,501	61,671	.....	3,510,842	8,276,000	2.36	2,840	960	330	4,130	134
Owen.....	90,714	1,162	2,110	.....	93,986	241,000	2.56	16	3	77	96	118
Parke.....	82,644	23,642	3,977	.....	110,263	259,000	2.35	148	42	27	217	129
Pike.....	1,749,939	29,264	39,121	.....	1,818,324	4,092,000	2.25	1,089	393	498	1,980	136
Spencer.....	4,467	2,270	140	.....	6,877	14,000	2.04	27	7	4	38	65
Sullivan.....	5,372,203	54,411	83,896	.....	5,510,510	13,601,000	2.47	4,244	1,947	814	7,005	150
Vanderburg.....	120,507	178,772	9,305	.....	308,584	810,000	2.62	256	93	37	386	167
Vermilion.....	3,101,624	34,760	110,914	.....	3,247,298	8,019,000	2.47	3,422	1,095	471	4,988	145
Vigo.....	6,458,083	144,357	179,295	.....	6,781,735	18,470,000	2.72	6,691	2,200	770	9,661	134
Warrick.....	937,801	25,348	23,512	.....	986,661	2,152,000	2.18	804	299	403	1,506	127
Total, excluding wagon mines	24,860,445	697,832	579,618	.....	26,137,895	64,763,000	2.48	22,777	8,228	4,403	35,408	136
Wagon mines served by rail	91,204	.....	.....	.....	91,204	283,000	3.10	.....	.....	.....	.....	.....
Grand total.....	24,951,649	697,832	579,618	.....	26,229,099	65,046,000	2.48	.....	.....	.....	.....	.....

<sup>a</sup> Includes also loaders and shotfirers.



## Commerce Department Indispensable Force in American Business

Under Hoover's Direction It Has Become Powerful Factor in Promoting Self-Government in Industry—Helped Bring About Three-Year Miners' Wage Agreement

From an agency with a reputation of being engaged largely in statistical and other stereotyped tasks the Department of Commerce within the last three years gradually has taken on vitality and momentum until now it is roaring along like a great motor and has become a vivid, powerful and indispensable force in American business.

Unquestionably Mr. Hoover's greatest accomplishment as the Secretary of Commerce, and the one which promises greatest return to the public, is his promotion of constructive self-government in industry. He has shown conclusively how these voluntary forces can bring American industry to a new high plane of efficiency. Codes of ethics have been established in many lines of business. Many others are in the making. Practices that are unfair to the public and to others in the same line of endeavor are being specifically listed and condemned. The way has been pointed out for industry and it is lifting its own standards and taking steps to see that they are maintained.

Despite all the ultra-conservatism that characterize the captains of industry Secretary Hoover broke through the crust of their reticence and has them co-operating with the government and with each other in an effort to put our economic life on a higher plane and to instill in all a new appreciation of the rights of others.

In the matter of trade promotion, leadership also is vested in those engaged in the businesses concerned. No step is taken until it is established that the trade wants it and needs it. That this policy is bearing fruit is shown strikingly by the fact that new business secured during the last fiscal year, as a result of suggestion or help from the Bureau of Foreign and Domestic Commerce, totaled \$529,000,000.

### Additional Funds Needed

If American business continues to increase its use of the Bureau at the rate maintained during the last three years, the point soon will be reached where more appropriations must be forthcoming. In fact, the handicap of inadequate financial support has made itself apparent in recent months.

Much more is done in the Bureau of Foreign and Domestic Commerce than trade promotion. There is a protective service which is of inestimable value.

One of the main reasons for the remarkable expansion in the use of this bureau unquestionably was the reorganization under which commodity divisions were set up. This form of organization is essential if leadership is to come from industry. The commodity divisions are under the immediate direction of specialists who have wide acquaintance in the industries with which they are familiar. They maintain the closest possible contact with

the individuals and with the associations in a particular industry, an advantage which is lost when organization is on a regional basis.

A notable series of studies is being made by this Bureau of those raw materials which are subject to arbitrary control abroad to the detriment of American consumers. The steps which can be taken to protect American consumers from unfair practices in other countries have been set forth in such a way as to promote production in other areas, to stimulate research and to encourage search for substitutes.

The new Division of Domestic Commerce is carrying into practice the ideas of business men in the effort to reduce the wastes and costs of distribution.

In the effort to insure lowest possible prices to the consumers and to increase the returns to the producers, the division of Simplified Practice, set up by Secretary Hoover, has been doing result-getting work in eliminating excess variety. It is taking many other steps to eliminate waste in industry.

### Defends Legitimate Trade Bodies

With a display of courage rather uncommon on the part of one holding political office, Secretary Hoover early in his term came to the defense of legitimate trade associations just at the time that these organizations most needed an outstanding champion.

Recognizing the far-reaching benefits of bringing ocean-going bottoms to the ports of the Great Lakes, thereby reducing the transportation charge against the products resulting from the labor of forty million people, Secretary Hoover proposed the creation of the St. Lawrence Commission. President Coolidge approved the recommendation and appointed Mr. Hoover as the commission's chairman. Under his auspices essential economic studies now are being made which will have an important bearing on the project, which, in addition to the waterway, involves the harnessing of 2,000,000 hp. of water power in an area where industrial development cannot expand much further until this power is made available.

Much has been done under Mr. Hoover's direction to call attention to the fact that electrical interconnection in the Northeast, the principal industrial section of the country, is not keeping pace with the best practice elsewhere. Studies have been made and maps prepared which emphasize again the need for interconnection, the construction of large steam central stations at strategic points, and the development of more water power. As a result of these studies the conclusion was reached that it would be possible to reduce coal consumption in the area by more than 50,000,000 tons annually,

power could be made available at lower rates, the factor of reliability could be improved, electrification of railroads could be made feasible, and power could be made available on farms so that much manual labor could be replaced by mechanical devices.

One of the great assets of the American business man is the statistical service furnished by the Bureau of the Census. Since the advent of Mr. Hoover there has been rapid expansion in the production of current figures which make available to all interested an accurate picture of the conditions under which operations are being conducted. Facts gathered by 116 trade associations, 55 government organizations and a large number of trade periodicals are compiled in highly serviceable form in the monthly publication *Survey of Current Business*. Nearly 1,500 business movements are portrayed through statistical tables, graphic charts and text material. It has popularized the use of index numbers. All industries are put on a comparable basis. General trends of production, stocks on hand and unfilled orders are available at a glance.

### Industrial Efficiency Increased

Under Mr. Hoover's direction the Bureau of Standards, the greatest physical laboratory in the world, has taken on new life. It has made a large number of technical studies which are of great value in making possible improved methods of production. Better utilization of raw materials has resulted from its researches.

Secretary Hoover played no inconspicuous part in bringing about the three-year wage agreement in the coal industry. He has consistently urged "peace and transportation" as the two most important steps which could be taken toward the stabilization of that industry. He made an effort just prior to the strike of 1921-1922 to effect an agreement providing for arbitration of the renewal of the wage agreement. The mine workers refused to agree to the proposal, but subsequent events revealed the lack of wisdom of such a course. After the strike was called Secretary Hoover effected a voluntary agreement whereby 85 per cent of the output was held down to the Garfield scale of prices. He has used the full weight of his influence to induce public utilities and other large consumers of coal to put in large stocks during the seasonal lull in coal production.

One of Mr. Hoover's first major accomplishments came early in his term and grew out of the conference on unemployment. He was able to enlist organizations of employers and employees, state officials, municipal officials and a large number of public-spirited individuals. A large program of public works was launched and other steps taken which gave employment to two million persons.

Out of this conference grew the study of business cycles. The report issued in the course of this study carried conclusive evidence that periods of depression are the natural outcome of a period of speculation and waste. It is believed that this report has made a sufficiently wide impression to arouse general interest in curbing inflation and booms.



## Big Sandy Coal Association Combats Discrimination

A coal tax at so much per bushel, like the present gasoline tax of 2c. per gallon, is being advocated in Kentucky. The Northeast Kentucky Coal Association met at the Ventura Hotel, Ashland, Ky., Oct. 23, to discuss the situation and to attend to other business. The coal men desire that the tax be placed on tobacco instead of on coal, seeing that the money has to be raised and that competition in coal is so severe that the tax would reduce output.

Instead of trying to make coal pay for good schools and good roads the coal association is in favor of the \$75,000,000 bond issue which has been proposed. The coal men present voted to indorse the issue. The Associated Insurance Companies are asking for an increase in rates, though they were raised a year ago. The operators' association has filed a demurrer, attacking the right of the State Compensation Bureau to fix rates, contending that they have only powers of approval.

The association will compile exact facts on taxes and insurance premiums paid and on the compensation paid to employees. This will be used in combatting unfavorable legislation. Previously it has sent out inquiries and not more than 40 per cent of the companies addressed made reply. On this occasion the association will make a search of court-house records and thus will obtain information as to the taxes paid by coal companies.

The association has lost many members during the recent slump in prices, companies withdrawing to avoid payment of dues, which are now 7 mills per ton, yet in the last six months the association has obtained new freight rates saving operators 27c. per ton, opening new markets to the west for lump coal and affording the operators of the Big Sandy an opportunity to enter the tidewater market.

Delbert H. Pape, assistant to the executive secretary of the National Coal Association, said that the dues in most other local associations run from 1 to 3c. per ton with other special assessments. Harry L. Gandy, executive secretary of the National Coal Association, said that a barrel of cement costs roughly as much as a ton of coal, yet the members of the cement manufacturers' association pay dues of approximately 7c. per barrel.

Coal to the extent of 146,716 tons was used in connection with the manufacture of chocolate and cocoa products during 1923, the Bureau of the Census reports. Similar figures covering other industries are as follows: Steam and other packing, pipe and boiler covering, and gaskets, 145,596 tons; pulp goods, 131,421 tons; needles, pins, hooks and eyes, and snap fasteners, 24,216 tons; music, printing and publishing, 2,192 tons; excelsior, 5,163 tons; peanut grading, roasting, cleaning and shelling, 9,848 tons; linseed oil, cake and meal, 73,608 tons; toys and games, 32,041 tons; refrigerators, 70,894 tons; flavoring syrups and bitters, 95,177 tons; iron and steel forgings, 610,191 tons; pumps, 84,789 tons.

## Call Outlaw Strike of 10,000 Hard-Coal Miners Despite Order by Lewis

Special to Coal Age

Scranton, Pa., Oct. 25—For the second time in as many weeks a general grievance committee has overridden the expressed orders of John L. Lewis, international president of the United Mine Workers, and has called a general strike in the anthracite field.

The latest general walkout, ordered for yesterday morning by the general grievance committee of the Pennsylvania & Hillside Coal & Iron Co., took effect in the face of contrary orders by the district union officials and the international president. As a result 10,000 men are idle, and all collieries of the Pennsylvania & Hillside company in the Pittston district are closed.

District union officials are keeping silence in anticipation of advice from the international president. The situation to them is the same as that when the Glen Alden grievance committee called a strike.

The action of the Pittston union men in defying their leaders has precipitated one of the most serious situations in the history of the union in view of the specific orders of President Lewis that the men remain at work as provided in the wage agreement. Only yesterday President Cappellini transmitted recent orders from President Lewis to the executive committee of District No. 1, which were said to contain the admonition, that continued insubordination on the part of the grievance committees might result in suspension or expulsion of members from the union.

This threat, however, falls on deaf ears in the Pittsburgh region, where at least 90 per cent of the unauthorized or "outlaw" strikes go into effect. Several groups of alleged radicals, who are said to have been prominent in the election of Rinaldo Cappellini as president of the district, are going their ways without any particular fear of being excommunicated from the union. Cappellini has several times been placed in embarrassing positions as a result of the actions of his supporters in the Pittston section. On one occasion the union local in which he holds a card called a strike without consulting the district officers. The local was on strike for several weeks and its grievance with several others, which the men charge are not being given attention, has resulted in the present outlaw strike.

In dismissing for want of jurisdiction the appeal of W. L. Stickel from decisions of lower courts adverse to him in his suit against the Big Laurel Coal Co. for title to coal lands in West Virginia, the U. S. Supreme Court on Oct. 13 declined to question the authority of the West Virginia Legislature to enact laws by which the state assumes title to lands on which taxes have not been paid for a period of years. No written opinion was handed down, the court acting upon authorities cited by attorneys for the coal company. Stickel claimed title because of inheritance from an old land grant. The coal company acquired the lands after they had been taken by the state because of not being entered on the tax books.

## Three Miners Die in Blast In West Kentucky

Three miners were killed by an explosion the night of Oct. 22 in the Hart Coal Corporation's mine near Madisonville, Ky. Fourteen others were in the mine at the time but came out almost unscathed. The cause of the blast had not been finally determined when this was written but unofficially it was believed to be due to a windy shot fired by Paul Wheeler, 22, one of the three victims. He had been married but four days. The other two men who died were Thomas Chinn, assistant mine electrician, and Gilland Joyce, machinist. Brent Hart, president of the company, estimated the property loss at about \$20,000 and said the mine would be partly closed down for about sixty days for repairs.

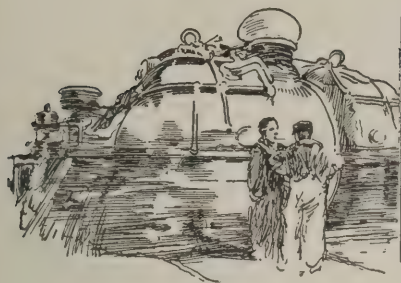
## N. C. A. Cost Accounting and Tax Committee Named

S. Pemberton Hutchinson, president of the National Coal Association, has appointed a special tax and cost accounting committee, with especial reference to a recent decision of the Solicitor of the Bureau of Internal Revenue on the subject of allowable expense deductions and replacements in coal-mine operations after normal output has been reached, as authorized at the recent meeting of the Board of Directors of the association. Following is the personnel: M. L. Gould (chairman), president, Linton Coal Co., Indianapolis, Ind.; J. D. Francis, vice-president, Island Creek Coal Co., Huntington, W. Va.; Michael Gallagher, general manager, M. A. Hanna Co., Cleveland, Ohio; C. F. Richardson, president, West Kentucky Coal Co., Sturgis, Ky.; Geo. B. Harrington, president, Chicago, Wilmington & Franklin Coal Co., Chicago, Ill.; W. D. Ord, president, Empire Coal & Coke Co., Landgraff, W. Va.; Frank S. Love, president, Union Collieries Co., Pittsburgh, Pa.

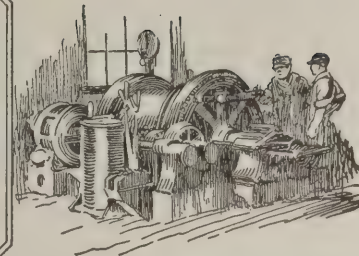
The committee has been called to meet at Washington, on Nov. 12, at which time the subject will be thoroughly discussed and the attitude of and the action to be taken by the National Coal Association determined. The change of interpretation of the Internal Revenue law as to what constitutes allowable deductions, according to an opinion by the Solicitor of Internal Revenue, presents a serious situation to the great majority of the bituminous coal producing companies, especially on account of unadjudicated returns in prior years. The committee includes men of broad experience in the industry who have intimate personal knowledge of the line of demarcation that should be drawn between ordinary industries and what may be termed to be a "westing industry," such as the mining of bituminous coal.

President Hutchinson had intended a committee of eight members, but inasmuch as one acceptance of the appointment has not yet been received, the announcement of the eighth member will be deferred for the time being. Prior to the committee meeting another prominent operator will be added.





## Practical Pointers For Electrical And Mechanical Men



### Cutting Down Old Brushes for New Use Is True Motor Maintenance Economy

**R**EDUCING maintenance costs is one effective method of promoting economy in any industry. This article is to describe a method which has effected worth-while savings in motor maintenance merely by making use of old brushes that are too often thrown away.

Any industry that employs a great number of direct-current motors and other direct-current apparatus, finds at the end of a year that the expenditure for carbon brushes alone amounts to a considerable sum. It is generally known among electrical maintenance men that when one-half, or more frequently one-third of a carbon brush is worn away, it is seldom dependable for further service in the type and size of holder for which it was originally intended. As a result the worn brush is scrapped and a new one put in its place.

It seems never to have been a common practice in electrical repair shops to refit the worn brushes of large sizes to the brush holders of motors employing brushes of smaller dimensions. This is probably due to the fact that the alteration of the brush destroys the copper coating that originally was placed on it in order to effect a maximum contact with its mounting, and that considerable time frequently may be required to fit the brush to the holder in which it is to be used.

However, this operation of refitting old brushes to new mountings of smaller dimensions may be shortened and made more accurate by sawing, grinding or filing the brushes to approximately the right size and then by forcing them, with an arbor-press or other suitable apparatus, through a gage as shown in the accompanying illustration.

This gage may be made of cold-rolled steel with openings shaped to the various dimensions of the smaller brushes that are to be made. Care must be taken to leave the edges of the openings accurate and sharp and they should be case-hardened to insure a maximum life to the edges, which trim the brush. One strip of steel long enough to accommodate gages of several sizes may be employed, and the various sizes should be stamped at the openings prior to the hardening of the

steel. Such a gage can be stored more conveniently and found more easily when needed than would several gages each made of a separate piece of steel.

One feature worth special mention, is that a carbon brush may be a carbon brush but all grades of carbon brushes are not adapted to any one service any more than one grade of brush is applicable to all services. Therefore, when resizing brushes, care should be taken that the various grades of the larger brushes are made only into the smaller sizes required by motors employing the same or a similar grade of carbon. If this practice is not carefully followed, considerable trouble may be experienced with the commutation of motors equipped with brushes of an unsuitable grade.

After the brushes are sized, they should next be drilled or recessed for the attachment of shunts. Detachable shunts may be attached after the brush

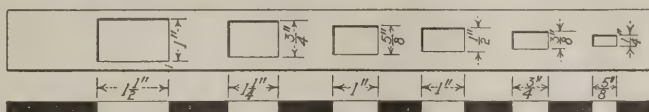


Fig. 1—Sizing Gage Makes Work Easier and More Exact

After the brush has been cut nearly to size and filed it can be pressed through a gage and made to fit the brush holder so that it will not chatter.

is copper coated, while shunts that are not detachable should be secured to the brush prior to the coating. Permanent shunts may be attached by placing them in the vertical hole as shown in Fig. 2, and filling the horizontal hole with molten solder, taking care that sufficient heat is applied to the carbon as well as the solder.

After the shunt is attached the brush is coated to effect a metallic contact in the mountings. This process is of a more specific nature than those just described but it is often essential. Several methods are employed. However, I will mention only two which are in most common use.

One consists of impregnating the carbons with wax so as to prevent the blue vitriol solution from penetrating. The carbons are then brushed with quicklime and without further preparation are placed in a copper sulphate solution and the copper deposited electrolytically. This solution can be prepared in the proportion of 1 lb. sulphate of copper and 1 lb. of sulphuric acid to each gallon of water. First dissolve the sulphate of copper in the minimum amount of hot water that will

take it into solution and then add the remainder of the water cold. After this add the required amount of sulphuric acid. When the solution is cooled it is ready for use.

Another method that has become very popular is to bring the carbon

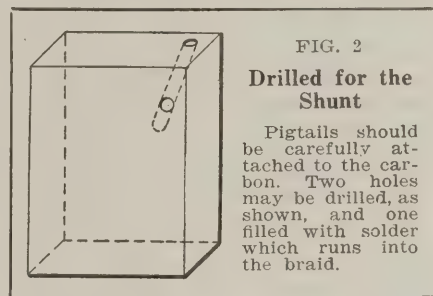


FIG. 2  
Drilled for the  
Shunt  
Pigtails should be carefully attached to the carbon. Two holes may be drilled, as shown, and one filled with solder which runs into the braid.

to almost red heat, then dip it into molten tin, afterward covering it with a layer of ammonium chloride. Then make the carbon a cathode in a copper cyanide bath and plate the carbon to about 0.2 of a mil, in thickness. After plating, the brushes must be washed, alternately dipping them in hot water and cold water and allowing them to remain in each bath from 5 to 10 minutes. Then the brushes must be carefully dried at about 110 deg. C. to remove all water from the pores.

ROYCE L. GRIMES,  
Electrical and Chemical Engineer  
Cleveland, Ohio.

### Using the Trolley Wire As a Meter Shunt

Split-type portable current transformers were developed to satisfy the urgent need for a means of measuring, with fair accuracy, the flow of current in an alternating-current line without the necessity of opening the circuit to insert the ammeter or its transformer. Many times it is likewise desirable to determine the amount of direct current flowing in a section of trolley wire or large feeder line. However, it is seldom done because of the cost and difficulty of inserting the meter or its shunt into the circuit.

This difficulty can be overcome by using the correct length of the conductor itself as a shunt. Fig. 1 shows the method of connection and Table I, which was copied from a mine electrical engineer's notebook, gives the necessary length of conductor between meter lead connections ( $a$  in Fig. 1) when using an ammeter or millivoltmeter which requires 100 millivolts at the terminals to bring the pointer to full scale reading.

This table was computed by using



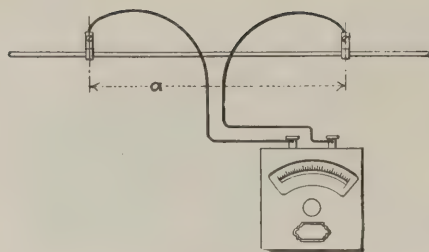


Fig. 1—Measuring Direct Current Without Opening the Circuit

Using the conductor as a shunt will give readings which are sufficiently accurate for most mine feeder tests. One of the greatest chances of error lies in misjudging the sizes of stranded conductors.

the following formula which was derived from Ohm's law:

$$L = \frac{M}{A \times R}$$

Where L = distance in feet of conductor between the points where meter leads are attached.

M = millivolts required at meter terminals to give full-scale reading.

R = resistance in ohms per 1,000 ft. of trolley wire or other conductor.

As the formula makes plain, it is necessary to know the millivolt capac-

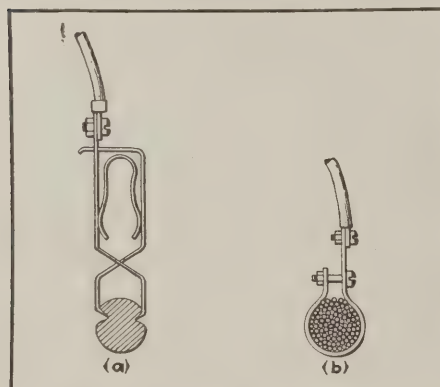


Fig. 2—Connecting Meter Leads

Connections to trolley wires are most conveniently made by using 20-amp. test clips. Special care should be exercised in getting a good connection to stranded conductors. Clean the surface, pull the clamp quite tight and have it touch as many as possible of the outside strands.

ity of the instrument used. This value is generally stated by a note on the meter scale or attached inside of the cover. The large majority of the portable ammeters for use with shunts are 100-millivolt capacity. If the millivolt value is not stated then the manufacturer should be asked to supply the information.

It will be recognized that this method of using the conductor as a shunt cannot be highly accurate. Errors are introduced by inaccurate placing of meter connections, temperature changes in the conductor and variations in the size

and length of meter leads. Such errors may amount to several per cent, but nevertheless the readings obtained will generally be sufficiently accurate to give the desired information.

A very satisfactory method of connecting to a grooved or figure 8 trolley wire is shown in *a* of Fig. 2. Here a 20-amp. test clip or battery charging clip, is used. This connection will not interfere with the passing of trolley wheels along the wires. Another easy way of making the connection is by means of ordinary trolley feeder clamps. A method of using a pipe grounding clamp for attaching the leads to a large stranded conductor is illustrated in *b* of Fig. 2.

## Can You Judge the Quality of An Adhesive Tape?

There are many grades of adhesive tape. A few are of a quality suitable for the purpose for which they are intended; many others are entirely unsuitable for any service. In the former class, quality must be the sole consideration, irrespective of manufacturing cost; in the latter class, quality is ignored in favor of low production cost.

The principal function of an adhesive tape in wire and cable splicing is to provide a firmly adhering, weather resisting, mechanical protection to a splice already properly insulated. The essential characteristics, therefore, of a high-grade adhesive tape for such a purpose are toughness and durability of fabric, the greatest possible adhesive strength and the longest weathering property.

The usual off-hand method of judging the adhesive qualities of a tape is to determine if it feels sticky." There is, however, a vast difference between "adhesiveness" and "stickiness." A tape which seems extremely sticky to the touch generally has little or no adhesive strength.

A much-used specification for determining the adhesive strength of a tape is:

"The adhesion between adjacent layers of the tape shall be such that when a strip of tape 2 ft. long is taken from a roll and wound upon a mandrel one inch in diameter, under a tension of 10 lb. per inch of width at a rate of 30 in. per minute and allowed to stand for 3 min. with the weight attached, a weight of 4 lb. per inch of width shall not cause the plies to separate at a rate greater than 30 in. per minute.

The test shall be made at a room temperature not less than 21.1 deg. C. or 70 deg. F. nor more than 23.9 deg. C. or 75 deg. F., the sample having been kept within these limits for at least 30 min. immediately preceding the time of testing.

"The mandrel shall be so free in its bearings that a weight of 1 oz. will cause it to revolve freely when sus-

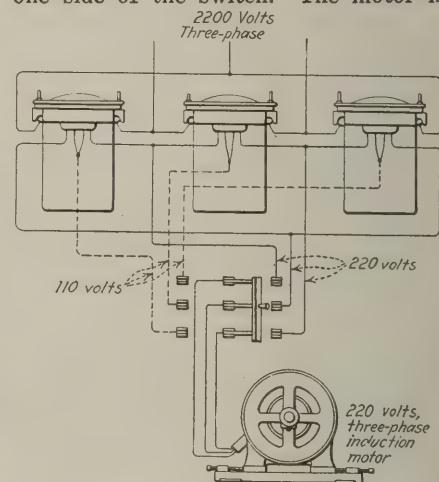
pended from a cotton string wound in a single layer on the center of the mandrel."

The conditions of such a specification must be carried out scientifically and exactly, in order to obtain reliable data on adhesiveness. A variation of any one of the conditions will entirely alter the results. This essential property of a high grade tape—adhesiveness—cannot be determined by any casual or superficial means, such as sense of touch, etc., a careful test should be made to obtain accurate comparative results.

## The Starter "Hopeless," and No Spare Available

Where 220- or 440-volt three-phase motors are used to drive fans, hoists and the like, it is usual to place the transformer installation within 25 or 50 ft. of the motor. The most common arrangement is a bank of three single-phase transformers having series-multiple low-voltage windings connected to deliver the desired voltage. When such is the case it is a simple matter to fix up a temporary starting arrangement to serve as a substitute for a damaged starter.

A few feet of wire and a three-pole double-throw switch, or two three-pole, single-throw switches will do the trick. The three extra wires, as shown by the dotted lines in the accompanying illustration, are run from the transformers and connected to the clips on one side of the switch. The motor is



## Emergency Starting Method

A standard transformer connection except for the wires shown by the dotted lines. Throwing the switch to the left delivers half voltage to the motor for starting.

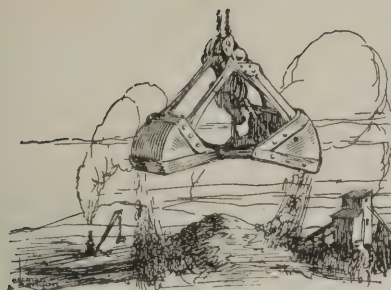
started on half voltage by throwing the switch to the left, then given full voltage by throwing it to the right, which is the running side.

When making such an emergency connection it is imperative that the starting and running leads be tied to the switch with the proper regard for the phase rotation, in other words so that the motors will tend to rotate in the same direction for either position of the switch. The plan used for obtaining half voltage is sometimes employed as a permanent method of supplying small, low-voltage, three-phase motors from conveniently located transformers which were installed primarily for other duty.

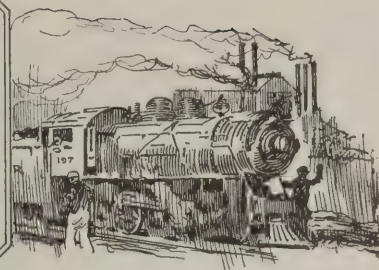
Table I—Conductor Length to Be Used as a Shunt

Size Copper	Full Scale Capacity of Meter				
	100 Amp.	300 Amp.	600 Amp.	900 Amp.	1,800 Amp.
No. 00 B. & S. gauge.....	12 ft. 8 in.	4 ft. 2½ in.	2 ft. 1½ in.	1 ft. 5 in.	0 ft. 8 ⅓ in.
No. 0000 B. & S. gauge.....	20 ft. 2 in.	6 ft. 8½ in.	3 ft. 4½ in.	2 ft. 2½ in.	1 ft. 1 ⅓ in.
500,000 circ.mil.....	47 ft. 8½ in.	15 ft. 10½ in.	7 ft. 11½ in.	5 ft. 3½ in.	2 ft. 7 ⅓ in.
750,000 circ.mil.....	71 ft. 6 in.	23 ft. 9½ in.	11 ft. 10½ in.	7 ft. 11½ in.	3 ft. 11½ in.
1,000,000 circ.mil.....	95 ft. 3½ in.	31 ft. 8 in.	15 ft. 10½ in.	10 ft. 7 in.	5 ft. 3½ in.





# Production And the Market



## Unseasonable Weather Causes Temporary Setback In Bituminous Coal Market

An unprecedented stretch of unseasonably warm weather has taken the edge off the demand for coal in many sections of the country, with the result that the market has been hard put to hold its own. This taken in conjunction with the grumblings of those who expected more of an improvement than there was any sound basis for has caused a temporary setback to even the conservative elements in the industry. Small-lot buying, only sufficient for current requirements, is again in evidence in many quarters, and as a natural consequence prices are none too firm. The fact is that though output, sales and prices have been climbing gradually, the gains have not been sufficiently heavy to enable the producers, except those in non-union fields that have been able to reduce wages to the 1917 level, to make a decent profit.

### Production Mounts in Eastern Ohio

Competition of the keenest character has to be brought to bear to get in on the business that is going. Then too the impending end of the lake shipping season looms as a menace that may release coal to compete in other fields. Nevertheless it is worthy of note that output in the eastern Ohio field has reached the highest level since early in February.

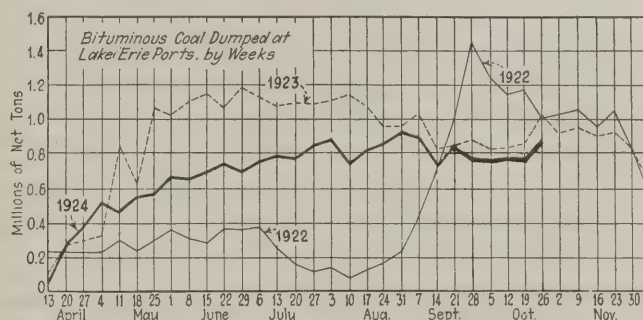
Coal Age Index of spot prices of bituminous coal halted for the time being in its upward climb, after seven consecutive weekly gains, standing on Oct. 27 at 176, the corresponding price for which is \$2.12—the same as on Oct. 20.

There was a marked increase in activity at Hampton Roads last week, dumpings of coal for all accounts during the seven-day period ended Oct. 23 totaling 384,268 net tons, compared with 326,124 tons handled during the previous week.

Coal movement up the lakes likewise mounted during the last week, dumpings at Lake Erie ports during the period ended Oct. 26, according to the Ore & Coal

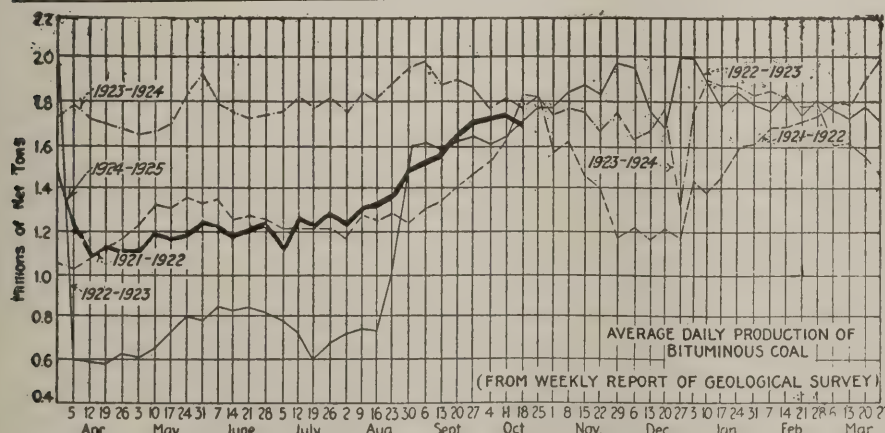
Exchange, being as follows: For cargo, 819,869 net tons; for fuel, 39,998 tons. This compares with 735,770 and 40,787 tons respectively for the previous week.

After ten weeks of steady increase, bituminous coal output reacted during the week ended Oct. 18, when, according to the Geological Survey, 10,255,000 net tons was produced. This was a decline of 298,000 tons from the week ended Oct. 11, when the output was 10,553,000 tons, according to revised figures. The falling off was due partly to the observance of Columbus Day. Anthracite production, on the other hand, registered a slight



gain during the week ended Oct. 18, 1,750,000 net tons having been produced, an increase of 13,000 tons.

Conditions have eased somewhat in the anthracite market with demand a trifle slower, though the line companies are easily moving output and independents are disposing of tonnage with comparatively little difficulty. Stove coal is the least plentiful of domestic sizes, but the demand for nut has picked up markedly. Egg is comparatively easy. Barley is moving the easiest of the steam sizes, buckwheat and rice being slow for this time of the year. Independent prices are holding fairly firm at last week's levels. Save for a few operations that have not been able to resume since the flood a few weeks ago, most of the mines are nearing maximum production.



### Estimates of Production

(Net Tons)

#### BITUMINOUS

	1923	1924
Oct. 4.....	10,699,000	10,275,000
Oct. 11 (a).....	10,953,000	10,553,000
Oct. 18 (b).....	10,684,000	10,255,000
Daily average.....	1,782,000	1,709,000
Cal. yr. to date (c)...	443,359,000	363,156,000
Daily av. to date.....	1,799,000	1,469,000

#### ANTHRACITE

Oct. 4.....	1,949,000	1,425,000
Oct. 11.....	1,943,000	1,737,000
Oct. 18.....	1,978,000	1,750,000
Cal. yr. to date.....	75,492,000	72,763,000

#### COKE

Oct. 11.....	284,000	127,000
Oct. 18.....	286,000	146,000
Cal. yr. to date (c)...	15,332,000	7,871,000

(a) Revised since last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.



### Midwest Runs Slowly

Continued warm weather is doing its stuff in Illinois, Indiana and Kentucky. Demand has sunk to a point that makes nut and egg sizes extremely difficult to move, and even lump, which has been oversold in the better fields, is dragging slightly here and there with no immediate probability of a change in prices. Production is lower. However, circulars on lump are well maintained in such regions as southern Illinois, Indiana Fourth Vein and Mt. Olive, Ill. Central Illinois' attempt to increase from \$3 to \$3.25 a short while back failed so utterly that \$3 remains the absolute top for that field. Kentucky, both east and west, is having its difficulties finding a place to put most coarse sizes, so that the circulars of those fields on lump and egg in and around Chicago are pretty hard to hold.

Steam coal has firmed up for several reasons, but price levels have not risen. One or two of the big steam buyers in the Chicago district, whose storage piles have been sink holes catching large volumes of distress coal at absurdly low prices all summer and autumn, have made steam contracts for the winter, thus taking them out of the spot market. The slump in domestic production due to warm weather was another factor tending to stiffen up screenings. But to counteract these several other big steam buyers withdrew from the market entirely during the past week, thus reducing the demand. They are waiting for

colder weather and heavier production to pull steam prices down again. The general result of these counteracting forces is that steam quotations are maintained more closely than they have been for weeks.

Domestic business is easing around St. Louis. Cold weather stimulates it and the last week or two of warm weather has brought about a relaxation although prices have not changed. Coal dealers as a rule are pretty well loaded up, but there is a shortage of high grade lump. Mt. Olive lump is in fairly good demand, but Standard is slow with no call. Local wagonload steam shows considerable improvement although the tonnage is far under what it was a year ago on account of the inroads of electric power. Carload steam is hard to find. Country domestic has slipped a little while country steam demand is unusually light and is for small nut and not screenings.

### Kentucky Moves Some Coal

With the exception of a little Harlan fine gas block and some of the finer grate coals of the Straight Creek and Jellico fields, \$3.25 appears to be the top for best block coal in Kentucky, a few southeastern Kentucky mines getting as high as \$3.50 on some business, while a few operators are reported as quoting \$3.75. The eastern Kentucky block market is \$3@3.50; lump, \$2.50@3; egg, \$2.25@2.50; nut, \$1.75@2; mine run, \$1.50@1.75 and screenings are 10c. a ton weaker at 75c.@ \$1 a ton.

### Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern					Midwest				
	Market Quoted	Oct. 29 1923	Oct. 13 1924	Oct. 20 1924	Oct. 27, 1924†		Market Quoted	Oct. 29 1923	Oct. 13 1924
Smokeless lump.....	Columbus....	\$5.85	\$4.35	\$4.50	\$4.35@4.65	Franklin, Ill. lump.....	Chicago.....	\$4.10	\$3.35
Smokeless mine run.....	Columbus....	2.30	2.20	2.35	2.25@ 2.50	Franklin, Ill. mine run.....	Chicago.....	2.55	2.35
Smokeless screenings.....	Columbus....	1.35	1.20	1.30	1.25@ 1.35	Franklin, Ill. screenings.....	Chicago.....	1.45	1.35
Smokeless lump.....	Chicago.....	6.10	3.85	4.60	4.50@ 4.75	Central, Ill. lump.....	Chicago.....	3.10	2.85
Smokeless mine run.....	Chicago.....	2.85	1.90	2.00	1.75@ 2.25	Central, Ill. mine run.....	Chicago.....	2.10	2.20
Smokeless lump.....	Cincinnati.....	5.85	4.50	4.35	4.00@ 4.60	Central, Ill. screenings.....	Chicago.....	1.05	1.15
Smokeless mine run.....	Cincinnati.....	2.50	2.35	2.10	2.00@ 2.50	Ind. 4th Vein lump.....	Chicago.....	3.35	3.10
Smokeless screenings.....	Cincinnati.....	1.50	1.30	1.15	1.10@ 1.25	Ind. 4th Vein mine run.....	Chicago.....	2.60	2.35
*Smokeless mine run.....	Boston.....	4.40	4.30	4.40	4.40@ 4.50	Ind. 4th Vein screenings.....	Chicago.....	1.20	1.35
Clearfield mine run.....	Boston.....	2.00	1.90	2.05	1.75@ 2.85	Ind. 5th Vein lump.....	Chicago.....	2.50	2.85
Cambria mine run.....	Boston.....	2.55	2.30	2.60	2.10@ 2.70	Ind. 5th Vein mine run.....	Chicago.....	2.10	2.10
Somerset mine run.....	Boston.....	2.25	2.05	2.05	1.90@ 2.40	Ind. 5th Vein screenings.....	Chicago.....	.80	1.25
Pool 1 (Navy Standard).....	New York.....	3.05	2.75	2.75	2.50@ 3.00	Mt. Olive lump.....	St. Louis.....	3.10	2.85
Pool 1 (Navy Standard).....	Philadelphia.....	3.10	2.70	2.70	2.50@ 2.90	Mt. Olive mine run.....	St. Louis.....	2.25	2.50
Pool 1 (Navy Standard).....	Baltimore.....		2.60	2.60	2.40@ 2.85	Mt. Olive screenings.....	St. Louis.....	1.25	1.25
Pool 9 (Super. Low Vol.).....	New York.....	2.30	2.10	2.10	2.00@ 2.25	Standard lump.....	St. Louis.....	3.05	2.85
Pool 9 (Super. Low Vol.).....	Philadelphia.....	2.35	2.15	2.15	1.95@ 2.35	Standard mine run.....	St. Louis.....	2.05	1.80
Pool 9 (Super. Low Vol.).....	Baltimore.....	2.15	1.85	1.90	1.85@ 1.95	Standard screenings.....	St. Louis.....	.45	.80
Pool 10 (H.Gr.Low Vol.).....	New York.....	2.05	1.90	1.90	1.80@ 2.00	West Ky. lump.....	Louisville.....	2.40	3.85
Pool 10 (H.Gr.Low Vol.).....	Philadelphia.....	1.90	1.75	1.75	1.65@ 1.90	West Ky. mine run.....	Louisville.....	1.65	1.70
Pool 10 (H.Gr.Low Vol.).....	Baltimore.....	2.10	1.65	1.70	1.65@ 1.75	West Ky. screenings.....	Louisville.....	.50	.80
Pool 11 (Low Vol.).....	New York.....	1.75	1.60	1.60	1.50@ 1.75	West Ky. lump.....	Chicago.....	2.60	2.85
Pool 11 (Low Vol.).....	Philadelphia.....	1.60	1.45	1.45	1.35@ 1.60	West Ky. mine run.....	Chicago.....	1.75	1.65
Pool 11 (Low Vol.).....	Baltimore.....	1.90	1.55	1.60	1.55@ 1.65				
High-Volatile, Eastern					South and Southwest				
Pool 54-64 (Gas and St.).....	New York.....	1.60	1.55	1.55	1.50@ 1.65	Big Seam lump.....	Birmingham.....	3.75	3.00
Pool 54-64 (Gas and St.).....	Philadelphia.....	1.60	1.50	1.50	1.40@ 1.60	Big Seam mine run.....	Birmingham.....	1.95	1.60
Pool 54-64 (Gas and St.).....	Baltimore.....	1.75	1.40	1.50	1.45@ 1.55	Big Seam (washed).....	Birmingham.....	2.35	1.85
Pittsburgh sc'd gas.....	Pittsburgh.....	2.55	2.40	2.40	2.30@ 2.50	S. E. Ky. lump.....	Chicago.....	3.00	3.10
Pittsburgh gas mine run.....	Pittsburgh.....	2.25	2.10	2.10	2.00@ 2.25	S. E. Ky. mine run.....	Chicago.....	2.25	1.60
Pittsburgh mine run (St.).....	Pittsburgh.....	1.90	1.85	1.85	1.75@ 2.00	S. E. Ky. lump.....	Louisville.....	3.00	3.60
Pittsburgh slack (Gas).....	Pittsburgh.....	1.05	1.25	1.20	1.15@ 1.25	S. E. Ky. mine run.....	Louisville.....	1.75	1.55
Kanawha lump.....	Columbus.....	3.15	2.10	2.55	2.35@ 2.75	S. E. Ky. screenings.....	Louisville.....	.75	.90
Kanawha mine run.....	Columbus.....	1.85	1.40	1.50	1.35@ 1.65	S. E. Ky. lump.....	Cincinnati.....	3.35	3.35
Kanawha screenings.....	Columbus.....	.90	.90	1.00	.90@ 1.10	S. E. Ky. mine run.....	Cincinnati.....	1.50	1.55
W. Va. lump.....	Cincinnati.....	3.35	3.25	3.10	2.75@ 3.25	S. E. Ky. screenings.....	Cincinnati.....	.75	1.00
W. Va. gas mine run.....	Cincinnati.....	1.50	1.50	1.50	1.50@ 1.65	S. E. Ky. lump.....	Cincinnati.....	1.50	1.55
W. Va. steam mine run.....	Cincinnati.....	1.50	1.40	1.35	1.40@ 1.55	S. E. Ky. mine run.....	Cincinnati.....	.75	1.00
W. Va. screenings.....	Cincinnati.....	.75	1.00	.95	.90@ 1.00	S. E. Ky. screenings.....	Cincinnati.....	.75	1.00
Hoeking lump.....	Columbus.....	3.05	2.50	2.55	2.40@ 2.70	Kansas lump.....	Kansas City.....	5.00	5.00
Hoeking mine run.....	Columbus.....	1.85	1.60	1.55	1.50@ 1.65	Kansas mine run.....	Kansas City.....	3.50	3.25
Hoeking screenings.....	Columbus.....	.85	.90	.85	.80@ .95	Kansas screenings.....	Kansas City.....	2.25	2.35
Pitts. No. 8 lump.....	Cleveland.....	2.55	2.35	2.40	2.00@ 2.80				
Pitts. No. 8 mine run.....	Cleveland.....	1.85	1.85	1.85	1.85@ 1.90				
Pitts. No. 8 screenings.....	Cleveland.....	.90	1.05	1.05	1.00@ 1.05				

\* Gross tons, f.o.b. vessel, Hampton Roads.

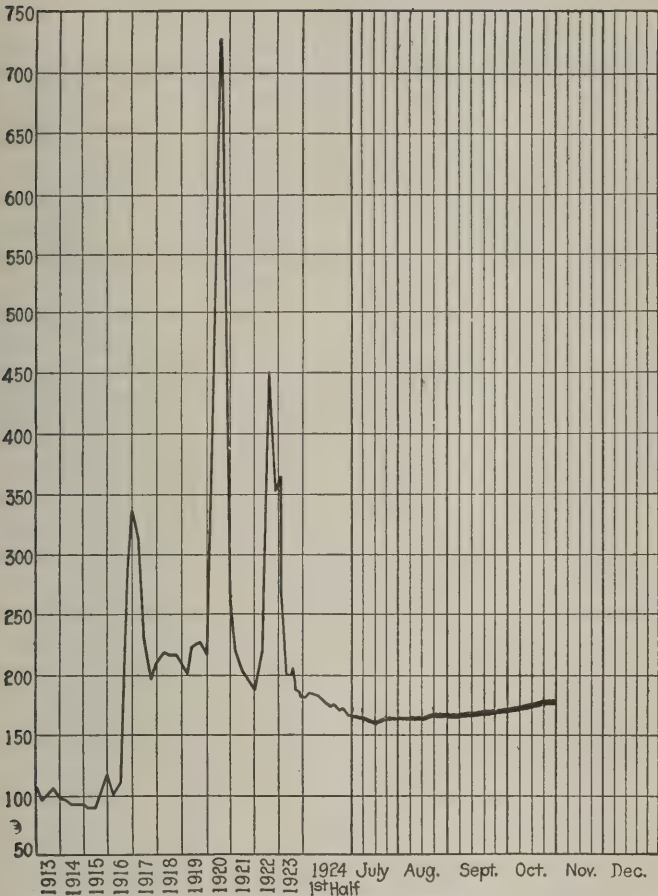
† Advances over previous week shown in heavy type, declines in italics.

### Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

		Freight Rates	Oct. 29, 1923		Oct. 20, 1924		Oct. 27, 1924†	
Market Quoted			Independent	Company	Independent	Company	Independent	Company
Broken.....	New York.....	\$2.34	\$9.60@10.50	\$8.00@9.25		\$8.00@9.25		\$8.00@9.25
Broken.....	Philadelphia.....	2.39				9.15		9.15
Egg.....	New York.....	2.34	9.85@ 12.25	8.75@ 9.25	\$9.25@ \$9.75	8.75@ 9.25	\$9.25@ \$9.75	8.75@ 9.25
Egg.....	Philadelphia.....	2.39	9.85@ 12.20	8.75@ 9.25	9.25@ 9.75	8.80@ 9.25	9.25@ 9.75	8.80@ 9.25
Egg.....	Chicago*.....	5.06	9.60@ 12.50	8.00@ 8.35	8.17@ 8.27	8.14@ 8.20	8.17@ 8.27	8.14@ 8.20
Stove.....	New York.....	2.34	9.85@ 12.25	8.75@ 9.25	10.00@ 10.50	8.75@ 9.50	10.00@ 10.50	8.75@ 9.50
Stove.....	Philadelphia.....	2.39	9.85@ 12.20	8.90@ 9.25	9.85@ 10.25	9.15@ 9.50	9.85@ 10.25	9.15@ 9.50
Stove.....	Chicago*.....	5.06	9.60@ 12.50	8.00@ 8.35	8.63@ 8.75	8.50@ 8.64	8.63@ 8.75	8.50@ 8.64
Chestnut.....	New York.....	2.34	9.85@ 12.25	8.75@ 9.25	9.50@ 10.25	8.75@ 9.25	9.50@ 10.25	8.75@ 9.25
Chestnut.....	Philadelphia.....	2.39	9.85@ 12.20	8.90@ 9.25	9.65@ 10.00	9.15@ 9.25	9.65@ 10.00	9.15@ 9.25
Chestnut.....	Chicago*.....	5.06	9.60@ 12.50	8.00@ 8.35	8.26@ 8.40	8.44@ 8.60	8.26@ 8.40	8.44@ 8.60
Pea.....	New York.....	2.22	6.75@ 8.25	6.15@ 6.65	5.25@ 5.50	5.50@ 6.00	5.25@ 5.50	5.50@ 6.00
Pea.....	Philadelphia.....	2.14	6.75@ 9.00	6.35@ 6.60	5.75@ 6.35	5.75@ 6.00	5.75@ 6.35	5.75@ 6.00
Pea.....	Chicago*.....	4.79	6.00@ 6.75	5.40@ 6.05	5.13@ 5.45	5.36@ 6.20	5.13@ 5.45	5.36@ 6.20
Buckwheat No. 1.....	New York.....	2.22	2.25@ 3.00	3.50	2.25@ 2.75	3.00@ 3.15	2.25@ 2.75	3.00@ 3.15
Buckwheat No. 1.....	Philadelphia.....	2.14	3.00@ 3.50	3.50	2.50@ 3.00	3.00	2.50@ 3.00	3.00
Rice.....	New York.....	2.22	1.75@ 2.15	2.50	1.80@ 2.00	2.00@ 2.25	1.80@ 2.15	2.00@ 2.25
Rice.....	Philadelphia.....	2.14	2.00@ 2.50	2.50	2.00@ 2.25	2.25	2.00@ 2.25	2.25
Barley.....	New York.....	2.22	1.00@ 1.50	1.50	1.25@ 1.50	1.50	1.25@ 1.50	1.50
Barley.....	Philadelphia.....	2.14	1.25@ 1.50	1.50	1.50	1.50	1.50	1.50
Birdseye.....	New York.....	2.22		1.60	1.35@ 1.60	1.60	1.35@ 1.60	1.60

\* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.





Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

	1924		1923	
	Oct. 27	Oct. 20	Oct. 13	Oct. 29
Index .....	176	176	174	184
Weighted average price .....	\$2.12	\$2.12	\$2.10	\$2.23

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke; 1913-1918," published by the Geological Survey and the War Industries Board.

Movement has been good and mines are operating at capacity, but haven't much business booked ahead, and can't advance prices in the face of mild weather, without bumping into competition from union fields.

In western Kentucky block coal is quoted at \$3@\$3.25; lump and egg, \$2.75@\$3; nut, \$1.60@\$2; mine run, \$1.50@\$1.80; and screenings, 60@75c. Screenings are in big supply in all sections, and move only at low prices.

Chilly weather is resulting in slightly better orders from retailers and domestic consumers, and rural demand is improving a shade. Utility demand is increasing with shorter days, along with fairly active industrial consumption of power.

Good car supply and fair labor conditions are making for steady production. With the exception of the Central City district of western Kentucky, which is still partly strike bound, there are not many tippie mines inactive.

Northwest Trade Not Brisk

The market at Duluth is firm in both hard and soft coals and the price is as last quoted. However, trade has been unusually poor within the past week, due to the weather and the fact that dealers are pretty well stocked up. On top of their other troubles cancellations on orders are beginning to come to the docks from such utilities as the Minnesota Power & Light Co. Water power supplied by the recent rains has reduced coal demand.

Shipments to the docks continue reasonably heavy. Thirty cargoes were received last week, of which one was hard coal, and fourteen are on the way, but none of this is anthracite. It seems that the docks are starting to cut down on their shipments of anthracite. This is natural, as

200,000 tons more will more than fill any needs, and anthracite is not in demand anyway.

The feature of the Head-of-the-Lakes market is still Pocahontas. In fact two of the docks are not taking carlot orders for lump, although they are still supplying their retail trade. Mine run Pocahontas is coming into favor because it is \$2.75 less than lump at the dock, and those who use it in their furnaces say that it is just as good.

There is no change in conditions around Milwaukee, which awaits the onset of seasonable weather. A slight improvement in the flow of orders is reported; also a continuance of equipment trouble—difficulty in obtaining gondolas, which are preferred in most cases to the hopper carriers that are available. No change in prices is noteworthy. Receipts by lake in Milwaukee during October, up to the 22d, were 87,240 tons of anthracite and 277,684 tons of bituminous coal, making the total for the season 659,894 tons of anthracite and 1,917,994 tons of bituminous coal.

Western Business Is Spotted

More mild weather has made it easy for Southwestern operators to catch up completely with long fall orders. Retailers are now somewhat overstocked and running time in Kansas is shortening. This naturally reduces the supply of screenings, the demand for which continues fair. Oklahoma has settled most of her labor troubles with consequent higher production. This hurts Arkansas, which had already begun to suffer from warm weather and from the fact that cotton-gin trade is sold up for the fall. Arkansas semi-anthracite lump has dropped 25c. to \$5.50@\$6.75. Mine run is \$3@\$3.50 and screenings \$1@\$1.50 with considerable shading. Henryetta (Okla.) lump is \$5.50; nut, \$4; mine run, \$3.25 and screenings, \$1.50.

Colorado running time has been picking up with better markets. Last week mines averaged 31 hours and only 20 per cent of lost time was checked against "no market." Production is heavy enough from most fields now so that with the first real cold spell both operators and railroads will have their hands full. Routt County got its usual bad car service from the Moffat Road last week, attributing 61 per cent of lost time to car shortage. A slight increase in price has taken effect all along the line on domestic sizes from the southern Colorado fields.

The heavy movement of crops in the mountain states is beginning to cause a shortage of cars in the Utah coal fields. If the weather continues mild, operators say the situation will not grow serious; but if winter sets in early there may be a coal shortage. Prices, both retail and wholesale, are steadier than for months. The labor situation is excellent. Industrial demand for coal is normal for the season. Retailers have a 30-day supply of coal in the yards at Salt Lake City.

Ohio Markets Feel Stimulus of Cold Snap

The seesaw season is on at Cincinnati with the end of the lake season in sight. A couple of frigid days cut down suspension orders and refusals considerably, but coal on consignment in railway yards is not a healthy sign and the glutting of the Chicago markets with coal from the smokeless fields has made the local trade cautious. Still, there has been no distinct break in prices, and perhaps best of all is the strength of mine run. Slack is about the same as last week. Interest centers upon the probable prices of smokeless for November. Screenings are none too strong with the old quotation of \$1.10@\$1.25 prevailing. River business is still held up by the dry season in the upper valleys.

Colder weather has stimulated domestic trade at Columbus. Smokeless grades and splints are in the best demand and there is a fair trade in Hocking, Jackson and Pomeroy grades and also in Kentucky varieties. Retail prices are steady at recent levels. The car shortage on certain West Virginia lines is causing some concern but is not sufficient to add much strength to the market. Weakness in steam grades is the bad feature of the trade. The worst situation is in screenings, which are very plentiful owing to the larger production of lump and egg and consequently prices on that grade are extremely low.

Lethargy has overtaken the Cleveland market. The steam trade is particularly dull, due to industrial inactivity. During the week there have been many instances of nut and slack, usually 10c. a ton over slack, selling at the same price. These grades are not in such demand at this time



as to maintain the usual spread in the prices. Spot prices on other grades remain unchanged, with no tendency to reduction. Production in the eastern Ohio field during the week ended Oct. 18 was the largest of any week since early February. The domestic trade is not quite as active as it was several weeks ago.

There is more movement at Buffalo but it is not pronounced enough yet to affect price. There is some prospect of a car shortage before the crest of the grain movement has passed, but the railroad men say that there will be no serious shortage if there is any, so the situation is not likely to change much right away.

### Oversupply in Pittsburgh Market

There seems to have been too much loading of coal at Pittsburgh, but it does not appear that as yet there is any considerable accumulation of coal on track, and there are no reports of actual "distress" sales to avoid demurrage. There has been no definite price decline and this seems to be due to prices having been thoroughly shaken out six months ago. The district has been running at 50 per cent or more since the middle of September.

### New England Inactive but Hopeful

Bituminous trade in New England can hardly be described as active. There are inquiries in the market, and because coal men have been starved for so long they are inclined to regard a few crumbs as a feast. Prices are less depressed, and there are those who feel they will grow steadily firmer to the end of the year. Most of the buying is confined to Southern coals.

The present range of No. 1 coals at Hampton Roads is \$4.40@\$4.50 per gross ton, f.o.b. mines, with \$5.65@\$5.75 approximately the level at Boston on cars. Portland factors have been able in some cases to extract \$5.90 and even \$6 from small buyers, and at Providence sales have been continued on the \$5.50 basis.

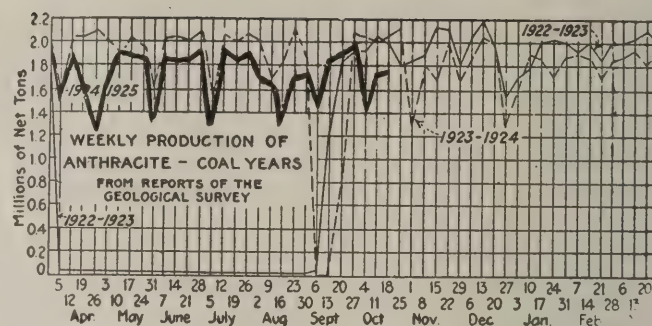
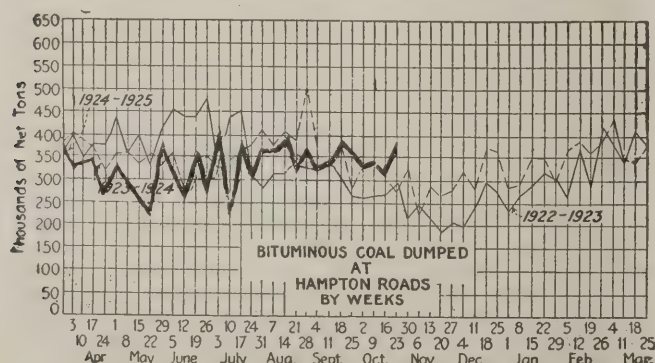
All-rail shippers have as yet hardly begun to feel any firmer tendency. What little coal is sold by this route is still coming forward in dribbles and at prices that still rest on the hard pan of irreducible cost determined several months ago. Shipments via the Philadelphia and New York piers are still light, and there is no hope of any considerable improvement during November. The highest grades that compete at all with Pocahontas and New River are close to \$5 per gross ton, f.o.b. vessel at Philadelphia.

### Atlantic Markets Gain, but Slowly

Growing demand has not yet affected prices materially at New York. Business is a little slower, due in part to weather conditions. Line demand is more pronounced than buying at tidewater. Quality is playing a more prominent part in sales, prices being secondary if the prospective buyer can be assured of a suitable coal. Receipts at tidewater are averaging larger than for many weeks. Most of the coal is on contract.

A little more tonnage is being moved at Philadelphia, but as yet there have been only slight price changes. Prices seem a bit firmer at present low levels and with all indications that this is the low water mark. Stocking up seems to be general, but there has been a freer offering of gas slack the past week or so, caused, no doubt, by the increased domestic demand in the West for screened coal. The most favorable news is of a few charters for export coal.

The coal trade at Baltimore seems to be marking time till election. One of the hopeful signs is the steady increase



of inquiry on future deliveries for industrial use. So far, however, the easy supply from the mines, keeping well abreast of all demands, has prevented any increase in prices. In the face of a fall off in exports for the 24-day period of October as compared with the similar period of September, which included all activities of that month, there is a distinct feeling of encouragement in the line of foreign trading as a result of inquiries now developing from north coast Mediterranean and South American ports.

The Birmingham steam market is showing better form and there is increased activity in the domestic trade. Business being booked from industrial sources generally is assuming a healthier tone. Lumber and cotton mills and hydro-electric power companies are in the market to some extent on account of low water. Bunker business also is reported slightly better. While quotations on steam for the most part remain unchanged there is a tendency toward higher figures as basic market conditions improve. Domestic prices are firm in the face of stable current demand and the absence of adequate stocks in many sections.

### Anthracite Markets Are Easier

Easier conditions prevail in the anthracite market at New York. Independent coals are not moving rapidly although so far operators and sales agents have had no difficulty in disposing of output at last week's prices. The old line companies move their tonnages easily. Weather conditions have not been conducive to heavy consumption and householders, especially in the suburbs, have delayed putting in their winter coal. Stove coal is the shortest of the domestic sizes. Demand for it continues strong. Chestnut moves without any trouble, while egg is easy but not accumulating. Buckwheat and rice are in slow call for this time of the year. Barley is the easiest to move and the better grades are bringing full company price schedule.

A couple of heavy frosts at Philadelphia brought householders out eagerly after fuel and dealers are now urging for coal. None of the snap has gone out of stove coal, but the demand for nut now outstrips all other sizes. The mines are again near maximum production, though a few are still closed down entirely. Retail prices are a trifle soft and a few dealers are selling at as much as \$1 less than the average. Wholesale prices among the smaller producers went upward a bit with the increased demand. Steam sizes are moving fairly well, but there is a tendency toward a surplus again.

The weather at Baltimore has been so mild that consumption in homes has been negligible. Most of the yards are carrying fairly large stocks of anthracite, and there will be ample fuels to meet the first call that comes when genuine cold weather arrives.

At Buffalo the demand for anthracite is improving, but the weather is too mild for anything like a rush. Consumers look on the supply as pretty certain and if there is anything to be gained by waiting they want to be prepared to take advantage of it. The outlook does not favor much falling off in cost, but that is mostly on account of lack of enterprise. The coke trade is still quiet.

### Car Loadings, Surpluses and Shortages

	Cars Loaded			
	All Cars	Coal Cars		
Week ended Oct. 11, 1924.....	1,088,462	198,154		
Previous week.....	1,077,006	186,516		
Week ended Oct. 13, 1923.....	1,084,458	194,963		
	Surplus Cars		Car Shortage	
	All Cars	Coal Cars		
Oct. 14, 1924.....	99,952	50,160		
Oct. 7, 1924.....	103,730	52,643		
Oct. 14, 1923.....	27,062	5,674	15,920	4,179



## Foreign Market And Export News

### Foreign Contracting Provides Only Bright Spot in British Market

Conditions in the Welsh steam coal trade are no worse, which is the very best that can be said of the present market. Enormous stocks are standing, and the Welsh pits are surrounded by huge mounds of small coals for which no buyers can be found.

Some interest is being shown in contracts for 1925, however. In addition to the French Midi contracts the Central Argentine Railways have placed an order for 300,000 tons of good admiralty large at about 26s., f.o.b., and the Entre Rios Ry. has placed an order for 50,000 tons on the same basis. The market is otherwise inactive, with prices fairly steady.

The owners' plea for a return to the 8-hour day has met with no response from the miners, whose co-operation would be necessary before the Act of Parliament authorizing such a change could be obtained. The attitude of the Welsh miners is to shorten the day still further, and frequent resolutions have been passed demanding a 6-hour day. The same attitude is maintained on the question of double shifts.

The Newcastle market is dull and weak. Prices have dropped a little, though there is a slightly improved inquiry for steam coals for winter shipment. Operators are hoping that the present abnormally low prices will encourage foreign buyers to clinch orders for early delivery.

Production by British collieries during the week ended Oct. 11, a cable to *Coal Age* states, was 5,088,000 tons, according to the official reports. This compares with 5,155,000 tons produced during the previous week.

### Trade Eases at Hampton Roads; Revival Expected

Business at Hampton Roads is slightly slower, with mild weather cutting down domestic trade with export movement at a minimum. New England is tak-

ing increasing quantities of coal and bunker trade is holding up well.

The market has weakened slightly, although supplies at tidewater are diminishing and dumpings at the coal piers are heavy. Retail business is good and prices are holding firm, with no prospect of reduction and a chance of increase in case forecasts of a severe winter are borne out.

The trade continues to be optimistic over the general situation and business is expectant of a general revival in activity.

### Less Life in Evidence in French Coal Market

The French industrial coal market shows little animation and business in house coal also is a little quieter, due to weather conditions. Shipments of sized products from Belgium are less active for the same reason.

The rise of sterling has increased the price of British coals, which were tending to attract more attention at the lower levels. British house and anthracite coals are neglected.

German coal deliveries on the open market continue small. The rolling stock position remains congested.

Deliveries of indemnity fuels during September to France and Luxemburg included 471,400 tons of coal, 437,800 tons of coke and 38,400 tons of lignite briquets, a total of 947,600 tons. This compares with 429,700 tons of coal, 425,800 tons of coke and 30,700 tons of lignite briquets, or a total of 886,200 tons of fuels, during the previous month.

Between Oct. 1 and 15 the O.R.C.A. received 144,603 tons of coke, a daily average of 9,660 tons.

With active British and French competition, the inquiry for industrial coals in the Belgian market is slack. House coals are steady but patent fuel and coke are depressed.

The strike is still on in the Borinage, but, the mine owners having signified their willingness to grant concessions, work is expected to be resumed soon.

### United States Domestic Coal Exports During September

	1923	1924
Anthracite, gross tons.....	175,689	327,322
Value.....	\$1,855,733	\$3,714,232
Bituminous, gross tons.....	1,768,620	1,502,829
Value.....	\$9,071,428	\$6,472,042
Coke, gross tons.....	95,479	41,804
Value.....	\$930,039	\$317,651

### NINE MONTHS ENDED IN SEPTEMBER

Anthracite, gross tons.....	3,445,793	2,626,108
Value.....	\$37,298,877	\$29,119,095
Bituminous, gross tons.....	15,334,621	11,659,463
Value.....	\$85,309,428	\$54,421,087
Coke, gross tons.....	932,719	419,412
Value.....	\$10,233,991	\$3,589,047

### Export Clearances, Week Ended Oct. 25, 1924

#### FROM HAMPTON ROADS

	Tons
For Canada:	
Swed. Str. Kalmorsund XI for St. John	1,710
Ital. Str. Aquitania for Montreal...	6,600
For Italy:	
Nor. Str. Betty for Argenta .....	3,456
For Newfoundland:	
Noro. Str. Osterdal for Lewisporte..	3,456
For West Indies:	
Nor. Str. Fram for Port de France..	4,013
Jap. Str. Spain Maru for Castries..	4,365

#### FROM PHILADELPHIA

For Cuba:	
Am. Schr. James W. Howard for Caibarien .....	2,200

#### FROM BALTIMORE

For Cuba:	
Nor. Str. Rananger, for Havana.....	4,057
For Porto Rico:	
Am. Str. Major Wheeler, for Ponce..	1,281
Am. Str. Delisle, for Yabucoa.....	481
For Chile:	
Nor. Str. S. Vindegg, San Antonio .....	1,494

### Hampton Roads Pier Situation

	N. & W. Piers, Lamberts Pt.	Oct. 16	Oct. 23
Cars on hand.....	825	897	
Tons on hand.....	53,728	55,076	
Tons dumped for week.....	111,860	120,512	
Tonnage waiting.....	5,000	10,000	
Virginian Piers, Sewalls Pt.:			
Cars on hand.....	1,118	1,244	
Tons on hand.....	80,000	85,400	
Tons dumped for week.....	105,729	118,360	
Tonnage waiting.....	7,800	17,487	
C. & O. Piers, Newport News:			
Cars on hand.....	1,596	1,913	
Tons on hand.....	84,060	101,455	
Tons dumped for week.....	74,486	104,225	
Tonnage waiting.....	3,760	8,815	

### Pier and Bunker Prices, Gross Tons

	PIERS	Oct. 18	Oct. 25†
Pool 9, New York...	\$4.80@ \$5.10	\$4.80@ \$5.10	
Pool 10, New York...	4.65@ 4.80	4.60@ 4.80	
Pool 11, New York...	4.35@ 4.50	4.40@ 4.55	
Pool 9, Philadelphia...	4.90@ 5.25	4.90@ 5.25	
Pool 10, Philadelphia...	4.45@ 4.70	4.45@ 4.70	
Pool 11, Philadelphia...	4.30@ 4.50	4.30@ 4.50	
Pool 1, Hamp. Roads	4.40@ 4.50	4.35@ 4.60	
Pool 2, Hamp. Roads	4.20@ 4.30	4.15	
Pools 5-6-7 Hamp. Rds.	4.00@ 4.10	4.00@ 4.10	

#### BUNKERS

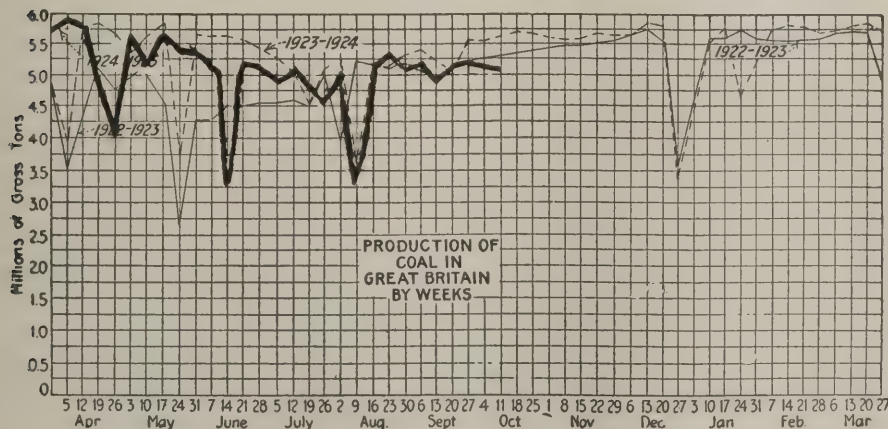
Pool 9, New York...	\$5.05@ \$5.35	\$5.05@ \$5.35	
Pool 10, New York...	4.90@ 5.05	4.90@ 5.05	
Pool 11, New York...	4.60@ 4.75	4.65@ 4.80	
Pool 9, Philadelphia...	4.90@ 5.25	4.90@ 5.25	
Pool 10, Philadelphia...	4.75@ 4.95	4.75@ 4.95	
Pool 11, Philadelphia...	4.50@ 4.70	4.50@ 4.70	
Pool 1, Hamp. Roads	4.50	4.50	
Pool 2, Hamp. Roads	4.30	4.25	
Pools 5-6-7 Hamp. Rds.	4.10	4.10	

### Current Quotations British Coal f.o.b. Port, Gross Tons

#### Quotations by Cable to *Coal Age*

	Oct. 18	Oct. 25†
Cardiff:		
Admiralty, large...	27s.	27s. @ 27s. 6d.
Steam smalls.....	11s. 6d. @ 15s. 6d.	15s. 6d. @ 16s.
Newcastle:		
Best steams.....	17s. 6d. @ 18s.	18s. 6d.
Best gas.....	22s. 6d. @ 26s. 9d.	20s. 6d. @ 21s.
Best bunkers.....	17s. 6d. @ 18s. 6d.	17s. 6d. @ 18s. 6d.

†Advances over previous week shown in heavy type, declines in italics.







## News Items From Field and Trade



### ALABAMA

The Pratt Fuel Corporation, of the Walter Moore Companies, Birmingham, has acquired the interests of the Grider Coal Co., including three mining operations, the Burnwell Coal Co., Yerkwood and others, \$500,000 being involved in the deal. It also is said that S. L. Yerkes will be in the Pratt Fuel Corporation. The Grider Coal Sales Agency is not affected by this deal, as it will continue as selling agency for the Pratt Fuel and the mines just taken over. The Walter Moore interests took over the Jagger and Nelson companies not long ago.

The Franklin Coal Mining Co. will begin the construction shortly of a Montgomery coal washer of large capacity to replace the old washery at its Powhatan Mine No. 2, which is not of sufficient capacity to handle the required tonnage from this operation. The improvements will cost approximately \$20,000. The Powhatan mines are located in the western section of Jefferson County in the Mary Lee seam and produced during 1923 about 250,000 tons of washed coal. The head offices of the company are in Birmingham.

### COLORADO

During September 935,364 tons of coal was mined in Colorado, compared with 863,500 tons mined in September 1923, bringing the total production for the first nine months of this year up to 7,221,707 tons compared with 7,345,599 tons mined during the same period last year. So far this year the number of days worked per mine in the state is 128.1. The total decrease in the production of coal during the first nine months of this year as compared with the corresponding period in 1923 has been 123,892 tons. During September 12,133 men were employed at the mines.

### ILLINOIS

Two Williamson County strip mines in the vicinity of Carterville have been reopened upon a full-time schedule. Weaver Mine No. 20 planned to resume operations about Oct. 25, after having been closed down since last November.

The Liberty Coal Co. with offices at 1206 Lehmann Building, Peoria, has installed a new coal cutter and a storage-battery locomotive. The company has ten trucks running between the mine and Peoria and is able to handle a large local business.

The Atwill Coal & Coke Co., McCormick Building, Chicago, has purchased

the entire assets and liabilities of the Atwill-Makemson Coal & Coke Co. J. L. Makemson retires from the business. F. C. Atwill remains as president of the company; H. L. Weith, vice-president, and J. B. Ullmen, secretary.

The Newcastle Coal Co., Edwardsville, has reopened its mine with twenty-five men working.

W. D. Obcamp has been elected a director of the Brewerton Coal Co. of Lincoln. James Casey, general superintendent of the mine, also has been elected to the board. Those on the board before these two names were added were: W. A. Brewerton, Roy O. West and Percy P. Eckhart. The board recently was increased from three men to seven, leaving two places to be filled, possibly by business men of Springfield and Lincoln.

William Y. Wildman, for years a traffic man for the Chicago & Northwestern R.R., has been made secretary of the Illinois Coal Traffic Bureau in Chicago, succeeding Frank H. Harwood, whose health has been precarious for some time and who must spend much of his time on his fruit farm in California.

The Kolb Coal Co. has opened its Mine No. 2, near Belleville, upon a full-time basis. This mine has been operating intermittently.

W. W. Austin, of Taylorville, has purchased the interests of J. M. Corine in the Decatur Coal Co., of Decatur, and will give his entire time to that work.

The Wenona Coal Co., Wenona, has leased its mine property to Edward L. Monser, vice-president of the company, and John Blazina, Marshall County mine inspector, who will operate it in partnership. The mine has been cleaned and is now ready for service.

The Shiloh mine of the Southern Coal & Mining Co., located near Belleville, has resumed operations after having been closed for six months. The mine employs 350 men. The Radium mine, employing 250 men, also has resumed operations.

Crescent Mine No. 1, in Marsh Creek Hollow, near Peoria, has begun operations on a half capacity basis after having been idle since March 29. This gives employment to about 250 men. With the opening of the Crescent Mine No. 1, about 40 per cent of the miners in the Peoria territory are now employed. This is an increase of 30 per cent over the total employed sixty days ago.

### INDIANA

The Brazil Collieries Co., of Brazil, has filed a preliminary certificate of dissolution with the Secretary of State of Indiana.

In the Indiana bituminous district 443,016 tons was produced by 189 mines during the week ending Oct. 11 as compared with 443,345 tons by 190 mines for the week previous. The 189 mines during the week ending Oct. 11 worked a total 3,461.34 hours and lost a total of 5,072.49 hours. Car shortage caused a loss of 59.66 hours; other railroad disability, 35.5 hours; labor troubles, 71.5 hours; mine disability, 625.25 hours; lack of orders, 4,280.58 hours. During the previous week lack of orders caused a time loss of 4,197 hours, or 49.54 per cent.

### IOWA

W. F. Moore, A. J. Harkins and Charles E. Moore have purchased the Liberty mine, located north of Des Moines, on the Twentieth Street road. The three men will operate the mine under the name of the Liberty Coal Co. and will do both a wholesale and retail business. They formerly owned and operated the Madison Coal Mining Co.

### KANSAS

An abandoned mine on Santa Fe land near Frontenac, in the Pittsburg field, has been leased by Albert Benelli and John Knoll, who have begun preparations to reopen it. The mine has a shaft to the coal, but the vein is only partly developed.

Despite a recent announcement by John L. Lewis, International president of the United Mine Workers, that Alexander Howat is ineligible for office in the organization, locals continue to send in his name for nomination for president of District 14 (Kansas). In one day recently seven locals placed his name in nomination.

### KENTUCKY

It has been reported at Madisonville that the Hart Coal Corporation, one of the big shaft mine operating companies of western Kentucky, will spend \$70,000 on a rescreening plant and in remodeling its tipples at the Victoria No. 11 mine and at the White City Mines. Improvements are to be completed within sixty days.

Two additional western Kentucky mines recently started operations on a non-union basis. One of these is the



Providence Coal Mining Co., of which Percy Berry is the head, the company starting with over 100 men on the waiting list. The Rockport Coal Co., operated by H. L. Tucker, at Centertown, also started operations, and with more men than it could use.

It is reported from Lexington, that Lexington and eastern capital is interested in a merger of coal mines and coal properties in Perry and Knott counties along Carrs Fork. J. P. Allen, of Lexington and Hazard, a large operator, is behind the movement, and slated to head the company if the merger is worked out. The Meem-Haskins Coal Co., Montgomery Creek Coal Co., Scuddy Creek Coal Co., and Carrs Fork Coal Co. are included in the merger plan.

Announcement was made at Lexington, Ky., Oct. 21, of purchase by L. W. Fields, of Lexington and Whitesburg, and the W. C. Belcher Land & Mortgage Co. of Ft. Worth, Texas, which has offices in Lexington, of a tract of several thousand acres of coal and timber land in Letcher County from the Mineral Development Co., of Philadelphia.

President Wes Ames of District No. 23, United Mine Workers, is urged in a communication sent him by County Attorney W. O. Smith, of Muhlenberg County to take immediate steps to adjust the differences between the union miners and operators of the district if he would save his organization from complete disruption. Mr. Smith formerly was president of District 23. He says three-fourths of the union miners of District 23 would go to work at a reduced wage if the union permitted it. Mr. Smith says he believes the policies of the international officers are wholly inapplicable to conditions in this section, and that they are using this territory to enrich that of the competitive field, which suffered from the same cause recently.

It was reported from Madisonville, Ky., on Oct. 22, that the West Kentucky Coal Co. had decided to abandon Mine No. 11, of the St. Bernard group, and that it would be sealed up. The mine was the first in Hopkins County, opened in 1870, and is largely responsible for development of the field and the establishment of the town of Earlington. The old mine has worked back so far in the hills that cost of transportation has become excessive.

The Court of Appeals of Kentucky, on Oct. 21, affirmed the Circuit Court dismissal of a petition of members of Union 3,348, District 19, United Mine Workers (southeastern Kentucky), to recover \$2 a day for each man, or a total of \$32,000, for an eighty-day

period in which they allege the Jellico Coal Co. arbitrarily closed down its mine and locked them out because they refused to surrender their charter. Failure to allege that notice had been given the company of fines to be assessed against the company rendered the petition invalid the court held.

## OHIO

Thomas H. Settle, general manager of the Virginia-Smokeless Coal Co., of Bluefield, was in Cincinnati recently consulting with engineers and others. He let it be known that another mine was being opened by his company and that production would be well on the way within a year.

Jewett, Bigelow & Brooks, through action of the receivers, closed their offices maintained on the sixth floor of the Dixie Terminal, Cincinnati, on Oct. 20. Only a small room on the same floor will be maintained by the receivers.

With Ben F. Ford at its head the Ford-Elkhorn Coal Co. has opened offices in the First National Bank Building, Cincinnati. Mr. Ford was long the directing partner of the Matthew Addy Co. in charge of its coal department prior to receivership proceedings. He is the owner of a mine or two in the Elkhorn district and has other valuable connections in that and other Kentucky districts.

Fire has broken out afresh in several new locations between New Straitsville and Shawnee in the big coal mine fire which has been raging in this territory for the past 40 years. Residents of New Straitsville are apprehensive that their homes may be undermined by the burning coal. It is estimated that more than 6,000 acres of good coal has been consumed in the last four decades.

The William S. Harman Coal Co. is gradually acquiring a considerable acreage around Philo, on the Muskingum River, and large developments will soon be made in that section. The company has obtained the contract to furnish the immense power plant of the American Gas & Electric Co., at that place with coal and the development will be made as the coal requirements increase. The power plant is one of the largest in the Middle West and already approximately \$25,000,000 has been spent in building it. Additional units are to be added later on. One of the first developments will be a large stripping operation.

A meeting of representatives of the Red Jacket Coal & Coke Co. was held recently at the general offices in Columbus with Ohio, Indiana, Michigan

and Canadian representatives in attendance. W. M. Ritter, chairman of the board of directors, and H. T. Wilson, president of the company, both gave talks. Sales manager Thomas H. Wilson had charge of the meeting. Following the conference all of the salesmen with I. D. Cooke, cashier, left to inspect the Red Jacket mines, where they were joined by W. H. Cummins, general superintendent; George Vance, superintendent, and J. F. Poindexter, who represents the company in Virginia and the Carolinas.

## PENNSYLVANIA

Wagon mines in the vicinity of the larger cities in the central Pennsylvania field are pushing operations and in many places cuts in prices of from 50c. to \$1 per ton have been made in order to get business. Many of the wagon mines are running full time and some two shifts.

At a primary election held in District No. 2, United Mine Workers, last week John Brophy for president, James Mark for vice-president and John Ghizzoni for national board member won over George Bassett, Jerre Ford and Evan Thomas, respectively, and will be elected at the general election in December. Mr. Brophy's total of locals placing him in nomination was 117 against 55 for Bassett; Mark carried 110 against Ford's 63 and Ghizzoni had 110 against 35 for Thomas.

The Mid Valley breaker of the Hazle Brook Coal Co., near Hazleton, has ceased operations and will be dismantled. Hereafter the tonnage of the mine will be hauled over the Lehigh Valley R.R. to the company's new breaker at Raven Run.

James L. Cooney, president of the Scranton Coal Co., Scranton, was recently tendered a banquet by men he played with and against in football 25 years ago, when he was a Princeton gridiron star. Harry Vaughn, former Yale player, was among those who turned out to honor the Scranton coal mining official.

Operation of the Wallwork mines at Mosgrove, near Kittanning, was resumed Oct. 20, after a recent suspension. The resumption gives employment to a number of men of the district. The mine was first opened in 1917, by Samuel Wallwork, who died a few weeks ago.

Three men were killed instantly in the Pittston vein of the No. 14 colliery of the Pennsylvania Coal Co., at Inkerman, when roof supports snapped while they were loosening a pillar stump and the roof fell, burying them beneath. The bodies were recovered by rescuers in about an hour's time.

Several operations in the Lehigh field which were idle during the summer months have resumed operations during the week and an increased tonnage is looked for by the Lehigh Valley R.R. The railroad and coal company managements are working to speed production to 20,000 tons a week as soon as possible and keep this up during the fall and winter, as the demand for fuel increases.



### Railroad Station, Rock Springs, Wyo.

In summer the only blue grass in town is grown in the station yard, and soil to grow that had to be brought from a ranch twelve miles away.



## UTAH

The arguments on motion of defendants to dismiss proceedings started by the federal government against the Carbon County Land Co. the Independent Coal & Coke Co. and Carbon County to recover title to 5,500 acres of alleged rich coal lands, were finished in Judge Tillman D. Johnson's court last week and the motion taken under advisement.

The Rains mine of the Carbon Fuel Co., which was wrecked by an explosion a few weeks ago, is now ready for official inspection. B. W. Dyer, chief mine inspector, and John Crawford, coal mine inspector, will be in charge. The State Industrial Commission had resolved that before the mine is opened for production it be completely rehabilitated; that all the stopings along entries where men are employed be permanent and of fireproof material; that dust in the mine be either loaded out or wet down, or rock dusted to such an extent as to render it inert and incapable of propagating an explosion and that the mine be examined by the coal mine inspection department of this state and pronounced safe.

Coal production in Utah for September amounted to 380,558 tons, a falling off of 5,634 tons compared with the previous month. In September, 1923, 408,536 tons was produced. The September production this year was the smallest in years. The heaviest output in September for the past five or six years was in 1922, when 489,220 tons was mined.

## VIRGINIA

The Clinchfield Coal Corporation has resumed dividends on the common stock. It will pay \$1.50 a share on Nov. 15 to stockholders of record Nov. 10. The regular quarterly dividend of 75c. a share on the preferred also has been ordered. The last previous payment on the common was  $\frac{3}{4}$  of 1 per cent, on May, 15, 1923.

The Clinchfield Coal Corporation, of Dante, has contracted with the Roberts & Schaefer Co., for the installation of R. & S. shaker loading booms to be installed at No. 2 tippie, Dante.

## WEST VIRGINIA

J. W. Powell, consulting and contracting engineer, of Charleston and Welch, W. Va., who was formerly employed for many years in the development and management of heavily pitching seams in the western part of the United States and Canada, left for Siberia Oct. 22 by the Str. Esthonia. Mr. Powell is to take the position of mine superintendent for the Autonomous Industrial Colony Kuzbus, a Russian state mining trust which operates the central and southern group of mines in the Kuznetsky Basin.

The Buckhannon River Coal Co., of Uniontown, Pa., has contracted with the Roberts & Schaefer Co., Chicago, for a new tippie of wood construction at Adrian, W. Va., which will be complete with all hoisting machinery, Marcus screens, and R. & S. loading machinery.

The Nelson Fuel Co., operating in the Greenbrier smokeless field, has just completed the installation of a water system. The water is forced by air into a main and pumped into an 80,000-gallon capacity reservoir which supplies the town of Leslie. It is freestone water and 350 gallons per minute will be produced from a depth of 190 ft.

The Fordson Coal Co., of Stone, Ky., has contracted with the Roberts & Schaefer Co., for a new steel tippie to be built at Twin Branch, W. Va. This tippie will be complete with retarding conveyor, Marcus screen and R. & S. loading booms.

Governor Morgan let it be known indirectly that he would not intervene in eviction proceedings in northern West Virginia between the miners and operators as requested by T. C. Townsend, representing the United Mine Workers. The Governor declined to take any definite action other than to refer the protest to the prosecuting attorney of Monongalia County. Governor Morgan did use his good offices in halting evictions in the Kanawha County field as a result of the visit of John L. Lewis to that section. Operators there had been evicting in accordance with a decision of the Supreme Court, but called a halt to such methods and proceeded to obtain possession of their houses through the usual court routine.

The Raleigh Wyoming Coal Co., of Charleston, has been granted authority by the Secretary of State of West Virginia to increase its authorized capital stock from \$4,100,000 to \$4,700,000.

Operators from various sections of West Virginia assembled at Washington a few days ago for a conference on proposed changes in the mining laws of West Virginia. Among those present were C. H. Jenkins, vice-president of the Hutchinson Coal Co.; Frank R. Lyon, vice-president of the Consolidation Coal Co.; Everett Drennen, president of the West Virginia Coal & Coke Co., and a number of operators from southern West Virginia. It is proposed to draft a new code of mining laws in the state.

The Pocahontas Fuel Co. will soon have two large, new plants in operation developing a 30,000-acre lease obtained from the Frick coal interests in Tazewell County, Va., and in McDowell County, W. Va. One plant is being constructed on the Jacob Fork and the other on the Dry Fork of Tug River. Cutting, cleaning and loading will be done entirely by machinery. The company expects next year to be able to mine 6,000,000 tons of smokeless coal in West Virginia.

## CANADA

A coal-weighting war has broken out in Hamilton, Ont., the dealers refusing to submit to city weighing and declining to pay back bills for it. They have their own scales that can be inspected at any time. The city is preparing to collect the bills by process of law.

Record coal outputs are being produced from the collieries of the British Empire Steel Corporation in the Glace

Bay area. The total quantity hoisted on Oct. 17 was 18,203 tons, the largest days production since October 15, 1915, on which day the output was 18,312 tons. No. 11 pit made a new mark with a production of 1,723 tons, breaking the previous record of 1,629 tons mined on July 22 last.

The miners of Alberta returned to work Oct. 20, ending the protracted strike, the men having ratified the agreement entered into by their representatives with the operators by a narrow majority. According to estimates of the Department of Labor the strike entailed a loss of about 775,000 working days and a coal production of approximately 1,500,000 tons. Now that the cost of production has been lowered by the wage reduction it is anticipated that the operators of Alberta can compete on more even terms with American producers and in addition to recovering their lost ground in Manitoba and the West, find a market in the neighboring states of North Dakota and Minnesota. The reduced cost of running also will further the projected shipping of Alberta coal to Ontario.

## Association Activities

The Kanawha Operators' Association recently held its twentieth annual meeting in Charleston, W. Va. The sessions were marked by complete harmony, all the old officers and directors being re-elected as follows: John Laing, president; D. H. Morton, vice-president; John L. Dickinson, treasurer; Duncan C. Kennedy, secretary. Directors: Col. W. M. Wiley, Col. E. O. Dana, H. L. Warner, F. O. Harris, W. C. Mitchell, F. H. Morton and C. A. Cabell. The Chesapeake & Ohio came in for high praise for the excellent transportation service rendered during the last year. The association adopted a resolution offered by Carl Scholz, vice-president of the Raleigh-Wyoming Coal Co., opposing the proposed child labor amendment to the federal constitution.

William R. Chedsey, professor of mining at Pennsylvania State College, in an address at the first fall session of the Pennsylvania Coal Mining Institute, at Johnstown Oct. 17, said he felt inclined to favor the use of high-voltage currents, explaining that he termed anything over 500 volts as high. Professor Chedsey's subject was "High Voltage vs. Low Voltage Electric Installations in Mines." He said he had no record of a death resulting from contact with a circuit of less than 220 volts and told of a fellow teacher who had to wet his fingers to feel the current of 440 volts. Of course, he said, death might result from a much less voltage, depending on the resistance of the individual. J. W. Paul, chief engineer of the U. S. Bureau of Mines at Pittsburgh, read a paper on "Explosions and Rock Dusting." Among the interested spectators at the meeting were a number of inspectors and mine foremen. E. Kent Davis, chief engineer for Peale, Peacock & Kerr, of St. Benedict, will speak at the next session of the institute, which will be held on Nov. 21.

## Industrial Notes

The Eagle Iron Works, Des Moines, Iowa, is now well established in a new and greatly enlarged manufacturing plant.

Blaw-Knox Company announces the appointment of Waldemar Dyrssen as chief engineer of the furnace equipment department and chief engineer of the forge and hammer welding department of the company. Mr. Dyrssen's experience in the steel industry has been extremely wide and comprehensive since his graduation from the Royal Technical University, Stockholm, Sweden, with the degree of Metallurgical Engineer, class of 1908.



## Traffic

### Defers Hearing on Proposal to Raise Switching Rate

The Coal, Coke & Iron Ore Committee, Central Freight Association territory, announces a postponement of the hearing on switching rates on coal, coal boulets and briquets, coke (except petroleum coke), coke breeze, coke dust and coke screenings, carloads, as shown in B. & O., C. & C. Series I.C.C. 2,429, from point of connection of B. & O. with P.R.R., Martins Ferry, Ohio, to private sidings on B. & O. R.R. within switching limits of Martins Ferry, Ohio. It has been proposed to cancel the switching rate of 13c. per net ton, minimum \$3.60 per car, and apply a rate of 76c. per net ton, as per Agent Davis' Tariff I.C.C., 43, and B. & O. Tariff I.C.C. 2306.

The hearing on this subject, which was set for Thursday, Oct. 30, 1924 (as per announcement of Public Hearing No. 34, dated Oct. 15), is postponed to Thursday, Nov. 13, 1924, at 10 a.m., in Room 606, Chamber of Commerce Building, Pittsburgh, Pa.

### Plan Better Handling of Coal At Birmingham

A meeting of traffic officials of all the coal-carrying lines in the Birmingham district and several other roads indirectly contributing equipment for the movement of coal and coke from that section was held at Birmingham, Oct. 22 and plans were evolved whereby it is thought that the mining industry will be provided with an adequate car supply through the winter and spring, a period in which the district has suffered materially in the past from shortage of cars. The meeting was attended by several coal operators, the interests of shippers being represented by S. L. Yerkes, chairman of the coal and coke committee of the Alabama Mining Institute.

### Kanawha Group Rate Sought by Winifrede Coal Co.

The Winifrede Coal Co., operating in the Kanawha district, has filed a complaint with the Interstate Commerce Commission requesting that rates from points on the Winifrede R.R. be established on the basis of rates from the Kanawha district group. It is asserted that the mines on that line are geographically, geologically and commercially and from a transportation point of view within the Kanawha group. The Chesapeake & Ohio R.R., however, has "failed, neglected or refused" to extend the group basis to the Winifrede R.R. The combination rates which must be paid, it is contended, are so excessive as to render it difficult at all times to market coal in competition with mines enjoying the group rates.

Freight rates on coke from Portsmouth, Ohio, to Wingate, Ind., which had been attacked by retailers, are reasonable, the I.C.C. has ruled.

## Obituary

**Harry B. Olmstead**, one of the best known coal operators in the Middle West, died at the Good Samaritan Hospital, Cincinnati, Oct. 24, following a short illness from pneumonia. He was 57 years of age and leaves a wife, one son and a daughter. Mr. Olmstead started in the coal business about 20 years ago in the Equitable Coal Co., which had mines on the C. & O. R.R. in the Kanawha field. Later he organized and became president of the Middle States Coal Co., which had offices in Columbus and mines at Hugar, W. Va. This company was later taken over by the Houston Coal & Coke Co., of Cincinnati, and Mr. Olmstead went with the new owners in a responsible position in the operating end of the business. He was secretary of the Williamson Operators Association.

**Edward S. Nevius**, widely known coal operator, died Oct. 19 at the home of his daughter, Mrs. Samuel Ayres, in Kansas City, Mo. Mr. Nevius was president of the Adair Coal Co., which operates mines in northeast Missouri, and formerly was president of the Nevius Coal Co., operating in Southeast Kansas fields. He was 60 years old and had lived in Kansas City more than twenty years.

**John William Wolfe**, 50 years old, treasurer of the Marmet-Halm Coke & Coal Co. and the Otto Marmet Mining Co., died suddenly at his home in Cincinnati, Oct. 16, of cerebral hemorrhage. Mr. Wolfe, who was born in Cleveland, Ohio, went to Cincinnati more than 25 years ago, and for the last eight years had been with the Marmet company. Mr. Wolfe is survived by his wife.

**Jesse Dean Stalter**, secretary of the R. Stalter Coal Co., of Columbus, Ohio, and an owner of several coal mines in the Hocking Valley district, was instantly killed when his automobile crashed against the concrete side of a viaduct in Columbus. He was seen to be driving rapidly when the car skidded with the fatal results.

**Charles Fergie**, a prominent engineer identified with the coal-mining industry, died at Montreal, Canada, Oct. 19, in his 67th year. Mr. Fergie was born in England and came to Canada in 1887, becoming manager of the Intercolonial Coal Co., Ltd., at Westville, N. S. He was afterward appointed vice-president and general manager of the company. In 1905 he was made general superintendent of mines for the Dominion Coal Co. at Sydney, N. S., holding that position until 1908, when he went to Montreal where for some years he practised as a consulting engineer. In 1914 he became president and managing director of the Intercolonial Coal Co., Ltd.

**J. J. Dobbie**, general manager of the Cumberland Coal Co., with headquarters at Douglas, W. Va., died late in October of pneumonia after an illness lasting more than a year. At the time of his death Mr. Dobbie was in his 69th year. Although a native of Maryland, Mr. Dobbie had lived in West Virginia for many years, where he had been prominent in coal mining circles. He was the father of W. Clark Dobbie, general superintendent of the New England Fuel & Transportation Co., and of Gibson Dobbie, also connected with the coal industry in the Fairmont region.

## Coming Meetings

**Illinois Mining Institute.** Annual meeting, Nov. 22, Elks Building, Springfield, Ill. Secretary, Martin Bolt, Springfield, Ill.

**American Society of Mechanical Engineers.** Annual meeting, Dec. 1-4, Engineering Societies Building, 29 West 39th St., New York City. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

**West Virginia Coal Mining Institute.** Annual meeting, Dec. 2-3, Welch, W. Va. Secretary, R. E. Sherwood, Charleston, W. Va.

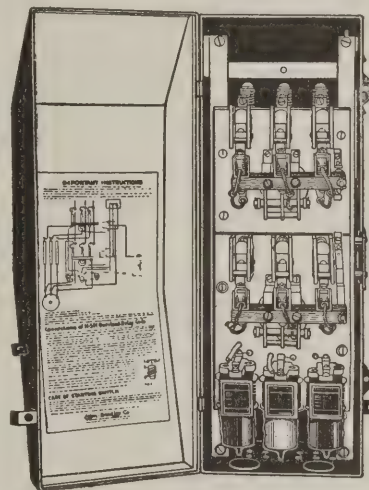
**Coal Mining Institute of America.** Annual meeting, Dec. 3-5, Chamber of Commerce Bldg., Pittsburgh, Pa. Secretary, H. D. Mason, Jr., Box 604, Ebensburg, Pa.

**West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers.** Fourth annual convention, Dec. 12 and 13, Huntington, W. Va. Secretary-Treasurer, Herbert Smith, Huntington, W. Va.

## New Equipment

### Automatic Resistance Starter Has Push Button Control

This starter is a push button control unit for squirrel-cage motors and is superior to the automatic compensator due to the smoother acceleration and greatly reduced current inrush when switched from the starting to the running tap. The graphite compression resistors are adjustable with one screw for any starting current. There are no taps to change. The motor is started by pressing the starting button of the push button station which closes



A Push Button Starts Things

After a predetermined time interval a relay closes the main line switch and the motor receives power directly from the line.

the starting clapper switch and allows the motor to accelerate with the primary resistors in the main circuit. After a fixed interval of time, the timing relay closes the main clapper switch and throws the motor on the line without opening the primary circuit and thereby short circuits the starting resistors. This switch has all the protective features of similar starters made by the Allen-Bradley Co., Milwaukee.

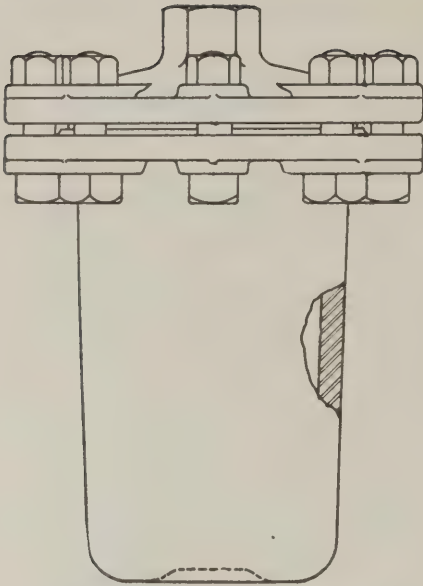
Such a starter as this is useful where the motor must be started and stopped from a position remote from the motor. Conveyors, belt lines and scrapers must usually be started and stopped from several different points.

### Rugged Steam Trap Designed For Extreme Pressures

A new steam trap designed for extreme pressures and temperatures has just been introduced by the Armstrong Machine Works, Three Rivers, Mich. In this latest addition to the company's line the body and cap are of high grade cast steel. All strains are removed from the castings by annealing.

The steel trap embodies the same patented basic operating principle that has been so well established in the com-





**Heavily-Built Steam Trap**

After the trap is completed it is hydraulically tested to pressures up to 3,000 lb. to insure tight joints and suitable castings. The valve parts are non-corrosive chrome steel, machined from bar stock, then heat-treated.

pany's standard type trap. The discharge is at the top so that oil and sediment are forced out whenever the trap discharges. An air port in the closed end of the inverted submerged bucket permits any air that may enter the trap to rise to the top and be released when the trap discharges.

Realizing the fierce service conditions imposed by high pressure and super-heat, the valve parts have been made particularly rugged, and throughout the trap is designed to stand up under the most severe conditions. The valve parts are non-corroding chrome steel, machined from bar stock, then heat treated. The valves are furnished with orifices suitable for pressures up to 500 and 600 lb., or higher in special cases. The cap is bolted to the body with eight to ten large bolts, depending on the size of the trap.

After the trap is completed, it is hydraulically tested to pressures up to 3,000 lb., to insure tightness of castings, joints, and valves. The steel body trap is also made for pulsating pressure service.

### **Simplified Diesel Engine Has Low Operating Cost**

An entirely new design of two-cycle, double-acting Diesel engine was recently announced by the Worthington Pump & Machinery Corp. The new engine combines a fuel economy comparable with that of the best existing types of Diesel engine, with dimensions, weight and construction cost per horsepower approaching those of reciprocating steam machinery.

Another striking and important feature of the design is the fact that, from all indications, the horsepower per cylinder can be carried to a far higher value than any yet attained in Diesel engines, thus immensely increasing the field of possible usefulness of Diesel-type power units.

The engine which has resulted from

long research will undoubtedly be of the greatest interest to industrial and mechanical engineers everywhere, as the relation of space, weight and first cost to horsepower is of importance in power plants. The new engine is characterized by simplicity of design and construction, and its initial cost per horsepower will consequently be low.

The basic principle underlying the new engine may be briefly stated to be: in the four-cycle Diesel engine one stroke in every four is a power stroke; in the two-cycle engine one stroke in two; in the new engine every stroke is a power stroke. Its working cycle, therefore, is virtually the same as that of a reciprocating steam engine.

The principle, of course, is not a novel one, but mechanical difficulties, chiefly concerned with the complicated heat stresses in the cylinder of a double-acting engine, have hitherto interfered with its successful application. The success of the Worthington design lies in the manner in which the problems of expansion and of heat removal are solved.

Once the major problem is overcome, the many advantages of the double-acting type are evident. The balance of the moving parts, for example, is simplified to a marked degree, and the weight saving, not only from the manner in which the required power per cylinder is distributed through four strokes instead of being concentrated in one, but also from the decreased provision needed to care for the momentum of moving parts, and in other ways, is obviously a big advantage.

The cylinder of the new engine might be described as composed of two single-acting cylinders, opposed end for end and working in opposite directions, their respective pistons flanged to the same rod, the scavenging and exhaust ports, cooling water circulation and expansion provisions of

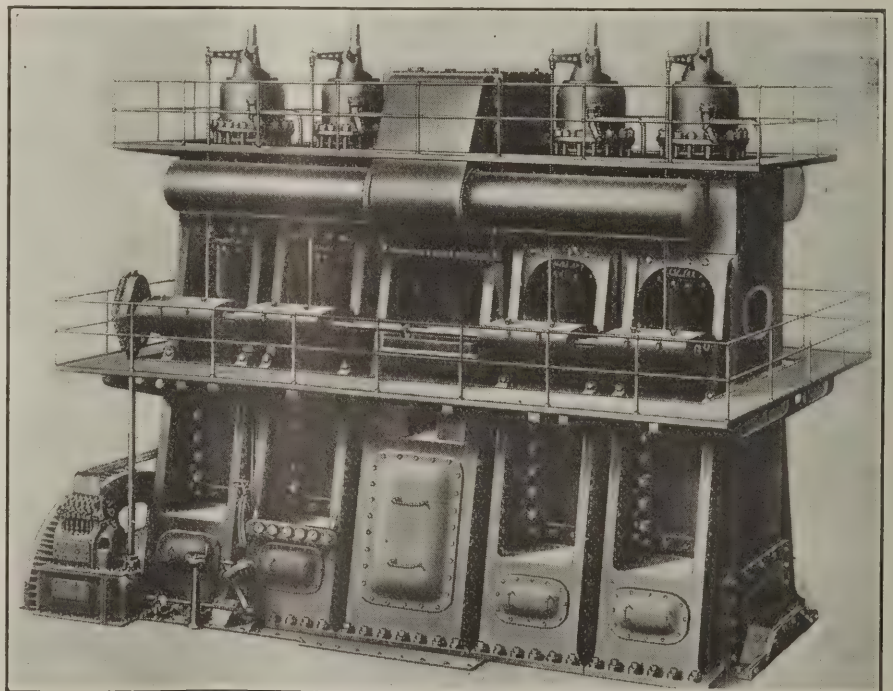
the two being virtually independent of each other.

There are three fuel spray valves, one on top of the upper end of the cylinder, and two in the bottom head on opposite sides of the piston rod, entering at an angle. One of the admirable points of the design is the ingenuity with which these two valves are proportioned so as to give a uniform and symmetrical distribution of the charge around the piston rod.

The reversing mechanism, as a point of interest, is second only to the unique cylinder design. Each of the three valves has its own cam, all three are geared to the same shaft. The cams are symmetrical, and all that is necessary to reverse the running direction is to shift all three cams simultaneously through 343 deg. on the shaft. This is accomplished by a worm shaft, which in turn is actuated by an oil-operated hydraulic mechanism controlled by a four-way cock, this in turn being operated by a single lever on the manoeuvring platform.

The engine is started and stopped by a single lever, which as it is moved forward successively opens the air starting valves, then the fuel supply valves, simultaneously closing the air starting valves; the lever being then capable of being set, by a ratchet and pawl, at any desired fuel supply. To stop, all that is necessary is to throw this lever back to the stop position.

The starting and stopping lever and the reversing lever, though independent of each other in all other respects, are interlocked so that the engine must be brought to a full stop before it can be reversed. Every effort has been made, in all the auxiliary mechanism as well as in the engine proper, to secure the utmost possible simplicity both in design and operation, that can be combined with the highest efficiency and reliability.



**Two-Cycle, Double-Acting Diesel Engine**

The unit is started or stopped by a single lever which opens the air starting valves, then the fuel supply valves. Every stroke is a power stroke. Its working cycle compares favorably with that of the best type of engines.



# COAL AGE

McGraw-Hill Company, Inc.  
James H. McGraw, *President*  
E. J. Mehren, *Vice-President*

Devoted to the Operating, Technical and Business  
Problems of the Coal-Mining Industry

R. Dawson Hall  
*Engineering Editor*

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## Outside the Four Walls

INDUSTRIES grow too largely from within. Outside progress and ideas are slow in reaching them. Manufacturers outside the industry do not know its needs, problems and opportunities; engineers in the industry do not know what has been done outside to solve their problems. The function of a technical paper is not to tell alone what the industry has done or is doing but to go a little afield and show what other industries are doing with kindred problems.

That is why *Coal Age* recently described a limestone strip pit where overburden was being removed by a steam shovel and a conveying system, and this week, describes a system of protection at the Anaconda copper mines which prevents a motorman from starting his locomotive when he is not aboard.

All the tricks and ingenuity in our industry are not of the coal man's own devising and we, mindful of that fact, are letting a few beams of inquiry circle over the surrounding fields. Where points of interest are developed we shall leave the spotlight on them for a while.

## Need for Cleaner Coal

NOTHING can convince the public that an untached piece of slate has any place in a consignment of anthracite; that it is justifiable to find such an impurity in coal that has been subjected to the cleaning process.

So long as such slate is found in small quantities or large, the feelings of the public will be unfavorable, no matter what the specifications may condone or permit. Campaigns to convert the public to a kindly perception of the difficulties of coal mining cannot make their way around that piece of slate, try as they will. Operators may tell about the vast expenditures for breakers, but that chunk of slate negatives every argument.

The impurity of industrial anthracite has made the price of that commodity low and its movement sluggish; it has given the bituminous operators a chance to get into the market; it has made a wide breach for oil. In earlier days only jigs were available for treating this fine material, and they were inefficient. Today we have better jigs and many other cleaning devices, and there is no reason why fine coal should enter the market unprepared or improperly prepared. When the freight, delivery and ash-removal rates are so large a part of the cost of the coal, careful cleaning at the mine should and does pay.

The foundation for good relations with the public lies in quality. It would pay the companies in the end to get possession of all old culm banks so as to prevent improperly cleaned culm-bank coal from reaching the market to be mixed by dishonest retailers with the better product shipped by the many ethical companies.

Too many corporations there are who regard the

terms of a specification as an end to be sought. It would be better if they entirely eliminated slate, no matter how large a tolerance the specifications might permit.

## Why Foremen Fail

AN ANALYSIS of the fatal accidents in Pennsylvania mines due to falls of rock for the first eight months of the year show that 60 per cent of these accidents occurred between the hours of 7 and 11 a.m. during which time mine officials made only 35 per cent of their visits to the working places.

As has been suggested, some of this trouble might possibly be avoided if the mine foreman who has to look after the safety of the workings made his inspections soon after the mine started. This he could do if he did not have any economic burdens, if all he had to do was to inspect and direct the manifold jobs of the mine workers so as to produce the maximum safety.

Unfortunately, in the morning, safety is not the mine foreman's first consideration, and he cannot so arrange his work that he can give it that predominance. Too often he finds that places have not been cut, the cutters having been sick or having absented themselves for other reasons. Consequently the loaders have to be shifted around, also the drivers. Some machine may have failed during the night leaving places uncut. Then again in mines with low coal about half the cars in the morning are full of rock loaded from headings during the previous night. Nothing can be done till the cars are emptied. Men must be deputed to help in this work, and a little supervision, it has been observed, helps hurry the process. Some men, also, have failed to appear so a miner has to be requisitioned to drive a locomotive or possibly a mule. A pump has failed or a flood of water has drowned out places, and men have to be shifted by reason of this untoward happening.

Furthermore there is a long line of men with complaints. They leave the presentation of their cases for either morning or evening when they will be passing the boss' office and they will be sure to find him around. Now, when the morning is still young, they find him and beset him from every side.

Thus, much of the morning passes without opportunity for activity in promoting safety unless there are safety bosses or shift bosses to take the burden and make inspections for the foremen. Even they are likely to be asked to carry messages to help the much beleaguered mine foreman get the work started, and he is indeed fortunate if all his troubles are at the mine mouth and he can avoid having to handle a difficult problem at the tippie. Cars have just been put in by the railway locomotive. In the winter some of them may be full of snow, frozen gravel, manure or sand. The foreman must provide men to clean them out. All the year round also comes the question of broken railroad cars and finding men and material for their repair.



Furthermore the cars are not always arranged to meet the needs of the mine and provisions have to be made to get the right kind and size of car spotted in the correct place so as to satisfy the market or the railroad.

Until there are more men engaged in supervision and until the foreman is prepared to delegate authority the difficulty will continue. The officials at the office should give the foreman a minimum of interference in the early morning, though that is a counsel of perfection, for they cannot get him later, if they delay getting him then.

Mechanical failures that give the mine foreman so much trouble should be removed. Cutters, loaders and daymen should be given a sense of discipline so that they will report at least, if they are going to lay off.

But all this is not as valuable as having real safety bosses who will visit the mines early and who will put safety first. It might be well to make them punch a clock inside the mine so that no orders or pleas of the mine foreman will prevent them from going to the mine at whistle blow. Otherwise they might be found coaxing a pump, removing ice, dumping rock, patching a railroad car or doing any of those many jobs which sometimes only a boss will consent to do.

### Union Hostility to Development

THE USE of loading machines has been abandoned in rooms at Orient No. 2 because the men who operated them, though paid a high wage, refused to load the cars to capacity or to do their utmost to obtain a good tonnage. They deliberately refused to live up to their contract. A loafing day is as deliberately dishonest as a short ton. The man who acts "ca'canny" at his work is as crooked as the grocer who puts sand in his sugar.

Dishonest merchants soon have to close their stores. That condition faces the mine workers of Illinois. If they will not act fairly in their business relations they will soon be without work, for they will have no companies to work for. Already the coal of western Kentucky is passing through southern Illinois to points in the middle West. A brave attempt was made by capital to put in machinery that would enable southern Illinois to stay in the market despite high wages and severe competition. Labor failed to appreciate this effort. The very expenditure of money was regarded as a proof that there were millions in the coal industry. The huge stake which was ventured was proof, they thought, that the venture could not fail.

Thus convinced the miners did their worst. As they thought that profits were inevitable and could not be jeopardized by any folly, however gross, they decided that nothing they could do could lose them their jobs. They will find only too late that by their act they have closed the door of opportunity. No one can battle with such obstacles as high wage rates, labor privileges and coal of low thermal value except by efficiency in operation. That efficiency the operators were willing to assure by the investment of millions in machinery. The mine workers on the other hand were not even willing to make an honest attempt to assist in their program. They would not even undertake to put in the contracted sixty seconds in the minute or the sixty minutes in the hour.

The mining fields are permeated with the idea that wages are not payment for work but are doles to be paid whether the work is done or not. The miners

cannot conceive that as they pay others only for services rendered, so others will pay them only in return for service. As they look for low prices so also do others. They alone cannot set the price and demand that others pay it.

The attempt to set up state lines in purchasing will not succeed, at least so long as the home state miner shows such arrogance in setting his wages and restricting his services that the purchaser loses heavily if he buys the local product. The average resident in Illinois or Ohio is little impressed by the mine worker of his state and is not willing to pay heavily to assist him in maintaining his unreasonable attitude.

### Going After Team Work

ONE WAY to reduce the cost of producing coal—a process that is essential in most coal-mining companies that expect to endure and declare dividends—is to foster greater efficiency in mine labor. One way to secure this efficiency is to prove to the men that good team work between employer and employee works both ways: it definitely benefits both. Lack of it positively damages both, especially in times like the exact present. Useless as it usually has been to preach team work in a union field, there are periods in which reasoning union miners will listen. This winter is one of them. Therefore, concerns, such as the Southern Coal, Coke & Mining Co. in Illinois, which are crusading for co-operation are on the right track and headed for the main bottom.

But nobody familiar with union field conditions underestimates the difficulty encountered. That is the reason why many a company has not even made a start. It is well known that an employer's magazine which tries to put over the lesson of team work, is going to be reviled by straw-boss officials of the union as "insidious propaganda." Messages, printed or verbal, from the head of the company intended to impress "team work" upon the men, are sneered at by the union as deceit. Continued company effort, by one plan or another, to encourage good feeling on the part of the men toward the company usually draws "don't-be-fooled-by-this-bunk" sarcasm. If this is not sufficiently counteractive, then more positive steps sometimes have been taken by the union to keep miners from "fraternizing with the enemy."

Miners too well satisfied are a menace to unionism. Men who practice "team work" and deliver a full day's labor for a full day's pay are beating somebody out of a job, as the union code would prove. So it is indeed hard to improve the efficiency of union members by winning their friendship and convincing them that they have a duty to perform toward their employer. But if a company is wholehearted and sincere in its effort it can proceed in spite of discouragement and refuse to be soured by disappointing results.

Developing a deep human interest in the welfare of its men ought to be regarded by every company as an obligation. That attitude if persistently adhered to, is bound to improve team work and raise efficiency in coal mines. The industry needs just this sort of thing.

The Illinois company is striving for it, declaring frankly that it is not out to reduce wages but to raise efficiency so as to help its men "preserve their jobs at the present wage scale if that is possible." And it appears to us that the company is making a good case. More power to it.



# Bumps and Shocks Disturb Johnson Colliery

Destructive Sudden Rock Movements Occur with Unpleasant Regularity — No Adequate Reason for Their Occurrence Is Assigned but New Theory May Be Solution of This Riddle

BY D. C. ASHMEAD

Bureau of Mines, Washington, D. C.

FOR SEVERAL years past a train of serious and fatal accidents has been occurring with discomforting regularity in the No. 2 Dunmore bed of the Johnson Colliery, operated by the Scranton Coal Co. near Dickson City, Pa. These have been the result of bumps or shock waves produced by ground or rock movement. Three of these accidents resulted in loss of life, others caused serious injuries, and yet others have occurred when no one was present in the workings affected. As usual in the case of such disturbances, the exact cause of the ground movements is impossible to determine positively but an interesting theory is advanced later in this article.

At a time when working places appeared to be normal and all other conditions safe, a sudden terrific crash would herald the occurrence of a bump or shock and one or more men might be killed or crippled. Exploration of the workings immediately following such an occurrence would show no apparent reason why such an accident should occur. Yet everything in the path of the bump would be displaced and possibly torn to pieces. Nevertheless, the roof, floor and ribs would appear to be in as sound a condition as before.

Three such accidents will be described. The first, shown in Fig. 1, occurred at the point marked 9 on the map, Fig. 4. Two men were mining the upper left-hand pillar shown in the figure. A skip had been taken from the pillar along the right side of the working place. Two cogs had been built for roof support 10 ft. apart with the mine track between them. After the bump when the rescue party arrived they found the roof, floor and ribs, so far as visual indications were concerned, in their normal condition, but the cogs instead of being 10 ft. apart were only 3½ ft. apart yet were intact. The track between them was nearly on edge instead of lying flat. Both the miner and his helper were killed.

When work had been resumed in this place after the removal of about 125 cars of coal from the pillar on which the men had been working, a channel or crevice 5 ft. wide at the top and about 2 ft. wide at the bottom was found within the pillar as shown in Fig. 1. Careful study and consideration of this phenomenon revealed no apparent reason for this fatal mishap.

## BUMPS SEEM TO OCCUR DURING PILLAR OPERATIONS

In the second accident men again were robbing a pillar. At the time the bump occurred they were in the act of loading a car. When the place was explored after the accident the roof, floor and ribs appeared to be in normal condition. Some loose coal, a comparatively small amount, was lying along one rib. The miner was dead and lying on top of the car where he had evidently been thrown or blown. His laborer, seriously injured, was lying between the car and the rib as shown in Fig. 2. This accident occurred at the

point marked 10 on the map, Fig. 4. Again no plausible cause for this mishap could be assigned.

The third accident was not fatal. A miner was driving a gangway through a pillar when the bump occurred. When the rescue party reached him, the roof, the floor, and the ribs were apparently normal, but the end of the mine track was sticking up in the air and the miner lying under it. This accident is illustrated in Fig. 3 and, as in the other two cases, no explanation for its occurrence was forthcoming.

Men who have been at work in a section where a bump or shock took place state that anything and everything in the direct line of the bump is destroyed. The direction of the force is marked. One man was walking along his room and had one foot in the air in the act of taking a step forward when a bump occurred. The only blow that he felt was one administered to the foot that was raised in taking the forward step. His leg was broken but no other part of his body was injured.

These bumps have been attributed to a number of causes. When they have been thoroughly investigated, however, the explanations advanced seem totally inadequate. It was believed by some at first that the ground movement might arise from an accumulation of gas or from the escape of air imprisoned under high pressure. No gas, however, has been found in any quantity in this coal bed. It is known to exist in the No. 2 Dunmore bed immediately above, but there are no workings

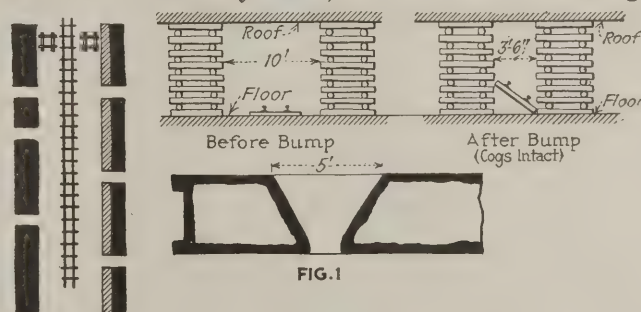


FIG. 1

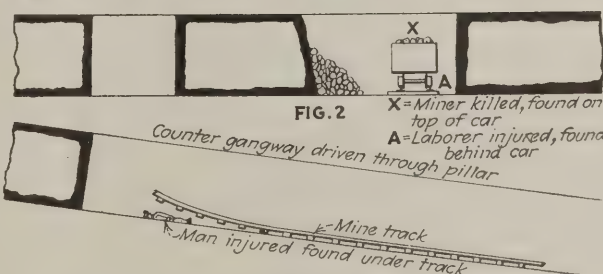


FIG. 2

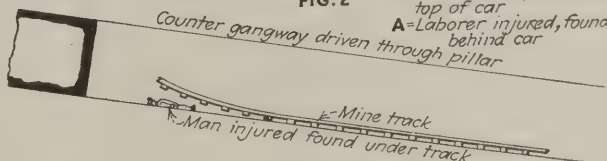


FIG. 3

## Figs. 1, 2 and 3—Scenes of Three Bump Accidents

In Fig. 1 the cogs shown were moved toward each other a distance of 6½ ft. yet remained intact. A wide fissure was later found in the rib. In Fig. 2 a small amount of coal was spalled from the left-hand rib. After the accident the miner was found, dead, on top of the car and his helper, badly injured, was lying between the car and the right rib. After the accident shown in Fig. 3 the miner was found lying under the uplifted end of the track. This accident was not fatal.



in this measure so far as is known and no connection or break exists between the two beds. All the other overlying measures have been first-mined on this property. In the areas where the bumps or shocks occurred tests were made to detect the presence of gas after each bump or shock had taken place, but no gas has been found. Only once has gas been detected in these workings and this will be mentioned later.

It was thought also that there might possibly be something in the strata underlying this bed that might have some effect upon these ground movements. Accordingly two boreholes, A and B, were drilled to a small bed corresponding possibly to the No. 4 Dunmore which lies below the one being worked. A section of these boreholes is shown in Table I.

Table I—Sections of Strata Penetrated by Boreholes

Borehole A			Borehole B		
Sandstone.....	24 ft.	6 in.	Sandstone.....	31 ft.	6 in.
Coal.....		3 in.	Coal.....		1 ft.
Sandstone.....	2 ft.	9 in.	Slate.....	2 ft.	6 in.
Coal.....		11 in.			
Slate.....	2 ft.	2 in.			
Coal.....		5 in.			
Slate.....	2 ft.	6 in.			
Sandstone.....	1 ft.				

The strata penetrated by the boreholes revealed nothing that obviously could have any effect upon the occurrence of bumps or shocks.

When going into territories that have been affected by bumps, the miners have found it possible to remove props by hand, which prior to the occurrence of the bumps were wedged tightly in place. This would indi-

cate that a movement of the roof had occurred and that the weight on the prop had been lifted.

Before entering into a discussion as to the probable

Table II—Cross-Section of Strata Above Dunmore No. 3 Coal Bed

Wash.....	90 ft.	Top—fire clay
Rock.....	30 ft.	Bottom—soft sandstone—89 ft.
Diamond Bed.....	5 ft. 8 in.	Top slate 10 ft.
Rock.....	99 ft.	Bottom sand-rock
Big Vein.....	6 ft.	Top sandstone
Rock.....	185 ft.	Bottom sandstone
Clark Bed.....	1 ft. 8 in.	Top sandstone
Rock.....	238 ft.	
No. 2 Dunmore bed	2 ft.	Bottom sandstone
Rock.....	28 ft.	Top 4 ft. fire clay to sandstone
No. 3 Dunmore bed	7 ft.	Bottom sandstone
Rock.....	20 ft.	Top sandstone
A bed.....	1 in.	

cause of the accidents above enumerated, it might be well to describe in detail the conditions as they exist at present or have existed in the past. A section of the strata from the surface to the third Dunmore bed is indicated in Table II.

The property in which this mine is located slopes from the mountain down to the Lackawanna River. About 4,400 ft. from this stream occurs an anticline shown on the map, Fig. 4, by the line marked 6. About 1,600 ft. from the river occurs another anticline which is shown by the line marked 4.

The coal in this bed shows the analysis set forth in Table III. A cross-section of the coal bed at the point where the sample analyzed was taken is shown in Table IV.

Just north of the anticline marked 4 on the map at

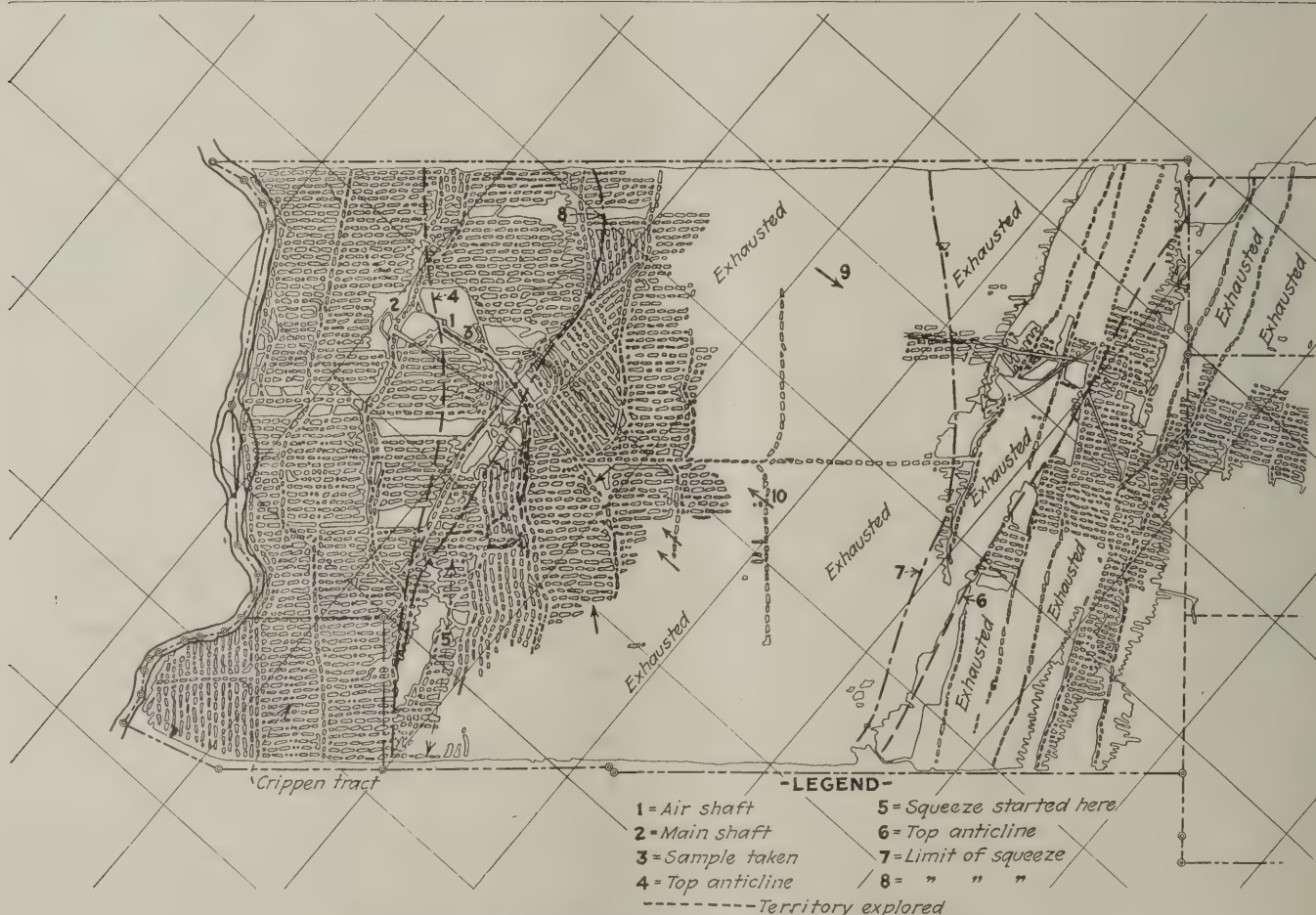


Fig. 4—Map of the Mine Workings Where Bumps Occurred

Much of the area covered by this mine has been mined out and completely exhausted. A squeeze beginning in the region marked 5 spread throughout the central portion of the mine. The locus of the bumps has also shifted until now they occur in an entirely different region from that where they were first noted. The direction of the force exerted by them, although not always clearly defined, is indicated as far as possible by the arrows.



Table III—Analysis of Coal Mined

Coal, Air Dried Basis		Coal as Received Basis	
Moisture.....	1.9 per cent	4.4 per cent	
Volatile matter.....	7.1 per cent	7.0 per cent	
Fixed carbon.....	79.2 per cent	77.1 per cent	
Ash.....	11.8 per cent	11.5 per cent	
Total.....	100 per cent	100 per cent	

the extreme easterly edge of the property a layer of soft graphitic material locally known as "buck" occurred immediately under the coal. After first mining, this buck squeezed out from below the pillars under the action of the 700 ft. of overburden. This movement brought a squeeze upon the coal. This squeeze began in the territory marked 5 on the map and then traveled in a northeasterly direction across

Table IV—Cross-Section of Coal Bed

Roof.....	Sandstone	Rock.....	1 in.
Coal.....	5 in.	Coal.....	8 in.
Rock.....	12 in.	Slate.....	1 in.
Coal.....	48 in.	Total coal.....	5 ft. 6 in.
Soft slate.....	2 in.	Total refuse.....	1 ft. 4 in.
Coal.....	5 in.		
Total thickness.....			7 ft.

the property. Its boundaries are shown by the lines 7 and 8 on the map. A break occurred in the measures at approximately the edges of the squeezed area as shown by the lines 7 and 8. It was in the course of second mining that the series of bumps above described occurred, resulting in the loss of five lives.

#### DIRECTION OF BUMP FORCE NOT ALWAYS DETERMINATE

The indicated direction of the force of these bumps as determined by observation of the engineers is shown on the map by the various arrows. Unfortunately, it was not possible in all cases to determine this direction.

At the time the squeeze occurred in this bed between the two anticlines a heavy accumulation of gas was noted. But since this was removed there have been no indications so far as can be determined that any gas exists in this measure.

When I visited this colliery a large portion of the coal had been worked out and the accessible area that I was able to visit is shown by the dotted lines on the map. Bumps and shocks have occurred in this territory until quite recently, but none transpired during my visit.

As has been stated much second mining has been done in this property and the territory along the extreme edge between the two anticlines has been completely mined out, no pillars being left. Lately the bumps and shocks have occurred more frequently in the old workings on the western side of the property than on the eastern side.

Although considerable study has been directed toward determining the cause of these bumps nothing tangible has resulted. A new suggestion, however, recently has been offered which may throw some light upon the situation. No bumps were noted prior to the squeeze, but afterwards two breaks in the overburden occurred, extending across the property. None, however, took place on the ends, that is, along the property lines. This signifies that a great mass of rock about 3,000 ft. wide was supported at both ends but not along the sides. This left the mass resting on a coal bed where first mining had been completed and consequently one wherein roof support had been appreciably reduced.

The strata pitch at an inclination of 9 per cent toward the river and, as a consequence, have a tendency

to move in that direction. As a result two strains were set up in them. One is a tendency to move down hill causing a tension horizontally in the strata as both ends are supported. This caused the center to bow down the slope. The other is a movement of the rock mass, which is about 700 ft. thick at the thickest point, in a vertically downward direction. The vertical movement was held back by the rock being supported at both ends and, as the measures did not break, they were subjected to a stretching action producing an internal tension. This stress was modified by the tendency of the roof to move down the slope. By the robbing of the pillars roof support was removed. Strains in the overburden were thus released or set up in a different direction to those previously acting. It is believed that this release of internal stresses, which probably was instantaneous in most cases, caused the bumps.

#### RELIEF OF ROCK TENSION APPEARS TO CAUSE BUMPS

As may be readily appreciated, any slight movement, amounting to only a small fraction of an inch, in this great mass of rock would cause the instantaneous release of a terrific force. One highly important indication that the force causing these bumps and shocks was tension is the fact that after one has taken place the props were found to be loose, showing that tension in the rock mass had been released and that the strata have gone back to their normal position.

Because mining has been completed along the eastern side of the property the bumps and shocks have ceased in the eastern portion of the territory and are now occurring nearer the western side. This change in the location of the bumps indicates that the fracture of the overlying strata along the eastern edge of the property has relieved the tension existing in them and, consequently, in this section no bumps or shocks now take place. In the western side of the property, on the other hand, as no breaks have occurred in the overburden, the tension still exists and bumps and shocks continue. They will probably persist until robbing has progressed to a point where the overlying strata fracture along the western boundary.

A further indication that this theory is plausible is the fact that when a bump or shock has occurred it has been felt on the surface as great a distance as two miles or more from its origin underground. This indicates that the action of the rock movement is similar to that experienced during an earthquake.

TO GET WORK, a group of union miners bought Goat Hill mine in Ohio. To get out of the soup line, a second group of union miners accepted jobs therein. To get efficiency, the first group fired the second. To get even, the second had the first fired out of the union for disloyalty. Naturally, this shut down Goat Hill mine. Both groups were jobless again. And now to get correct answers to the great cross-word puzzle: "Who in Sam Hill is the blinkety-blank goat of Goat Hill?" we offer two tons of strictly fresh gob, a new pair of ohms, six slightly used sticks of dynamite, and other valuable prizes.

WE SOLEMNLY WARN Hon. Andy Gump, cartoon candidate for President, that his "helpless-as-a-fish-in-a-coal-mine" joke is going to beat him. Everybody knows coal mine fish are the ablest in the world. Thousands or good 7-ft. shot holes are sunk in solid coal every day by fish tails.



# Factors Which Control the Choice of a Fan

Starting Problems and Their Solution—Slip-Ring Motor Better Than Squirrel-Cage—Synchronous Motors Should Have Pull-In Equal to Full-Load Torque—Super-Synchronous Motor Designed to Meet Difficulty—Variable-Speed Fans\*

By F. L. STONE

Industrial Engineering Department, General Electric Co.,  
Schenectady, N. Y.

**T**HE LOAD characteristics of a fan are similar to those of most centrifugal apparatus, the power required by a given mine fan being approximately proportional to the cube of the speed. The normal speed of large fans varies from 75 r.p.m. to 350 r.p.m. or even higher, depending on the size and design of the fan.

The starting load of large fans differs from most other loads in that it increases rapidly with the speed. Fans cannot be bypassed advantageously. It is impractical to close the intake or outlet because of its size and the consequent pressure that would result. Furthermore, could either or both of these openings be closed, it would only reduce the load at full speed to about 75 per cent of full load. Many operators demand variable-speed fans, for they believe that at times it may be necessary to increase the speed and at other times it may be advisable to reduce it. I think, however, that mines which run their fans at constant speed delivering sufficient air at all times to keep the mine free from dangerous gases are much more numerous than those that require fans that can be run at variable speed.

With the constant-speed fan, the problem is largely one of starting. The drive may be an induction motor of the squirrel-cage type or one of the slip-ring type, geared, belted, or having a chain drive. Due to the peculiar starting conditions it would seem that the slip-ring motor has a distinct advantage over the squirrel-cage motor. If, however, the squirrel-cage motor be used, very high percentage voltage taps must be provided in the starting compensator, otherwise the motor will be thrown across the line when it is running much below full speed, thus putting an excessive stress on the apparatus and the system. With the slip-ring motor, the torque can be controlled nicely, and the speed increased gradually as required.

## SYNCHRONOUS MOTORS USED SUCCESSFULLY

Synchronous motors have been suggested for fan drive, but the pull-in torque would generally have to be 100 per cent of full-load torque if the motor is just large enough to drive the fan. To meet this requirement it would be necessary to include certain features of design which would be detrimental to other desirable characteristics in the motor. Synchronous motors have been installed, however, using a motor considerably larger than is actually necessary to drive the fan. This provides sufficient pull-in torque, but on the other hand it gives the operator a motor too large for normal service. Synchronous motors have been successfully installed on fan drives using a clutch between the rotor and the load. The motor is brought up to speed with the clutch disengaged, and the load

is picked up by the clutch. Some installations as large as 750 hp. have been so made.

To overcome the starting troubles on fans and other similar devices such as mills and crushers where there would be a decided advantage accruing from the use of a synchronous motor, one large manufacturing company has developed what it chooses to call a super-synchronous motor. This motor has, as far as the load is concerned, a starting torque equal to the breakdown torque of the motor. This is accomplished by mounting both the stator and the rotor on bearings

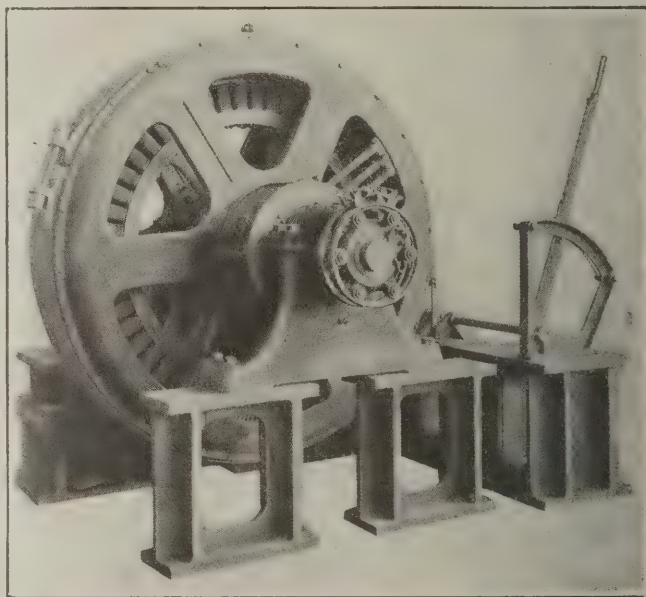


Fig. 1—Motor That Will Give High Pull-In Torque

The stator of this motor revolves when power is first applied to it. The brake mechanism is used to stop the rotating stator and thus permit the motor to exert its pull-out torque to start a load.

and placing a large brake around the outside of the stator.

To start a fan with such a motor the brake is released and power is applied to the stator. This begins to revolve and comes to synchronous speed with no load upon it. The field is then put on the rotor and the brake applied to the stator. When the braking effort is sufficient the stator begins to slow down, but simultaneously the rotor and load begin to accelerate, increasing in speed as the stator is slowed down. The sum of the two speeds is always equal to the synchronous speed of the motor. Finally, the stator is brought to rest and the rotor and load are at synchronous speed. I do not know of any such installation having been made on a fan, but about fifty of these machines have been installed in cement and metal mills with excellent results. One of these motors is illustrated in Fig. 1.

\*From paper, entitled "Electricity in Mines," presented at Pacific Coast Convention of American Institute of Electrical Engineers, Pasadena, Cal., Oct. 13-17.



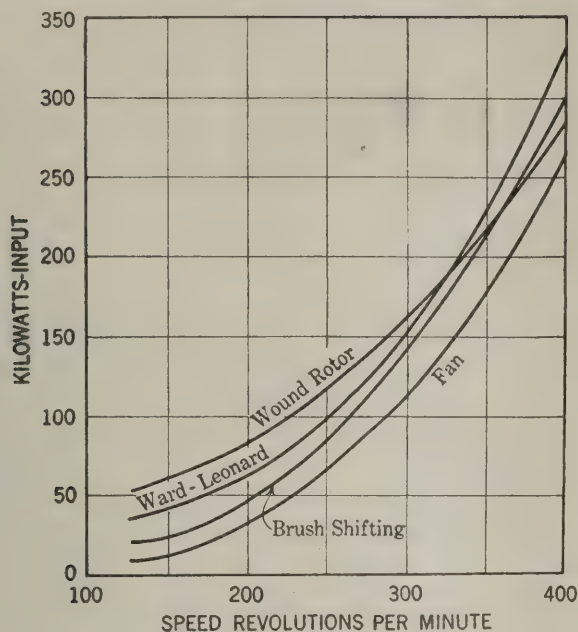


Fig. 2—Operating Curves of Fan Drives

The ventilating system of a mine offers opportunity for application of many different types of motors. In each case the particular operating conditions and load requirements must be studied. Power-factor corrective equipment here may be quite serviceable.

The synchronous motor also lends itself much better to direct connection to the fan than the induction motor on account of the low power factor of the latter at the slow speed which the fan requires. In view of the fact that rewards are provided for high power factors by many power companies, it would not be surprising, as the work of electrification proceeds, to see many more synchronous-motor drives for fans installed.

Variable-speed fans present an added problem. The starting conditions are similar to those of the constant-speed fan, but we have the additional problem of the

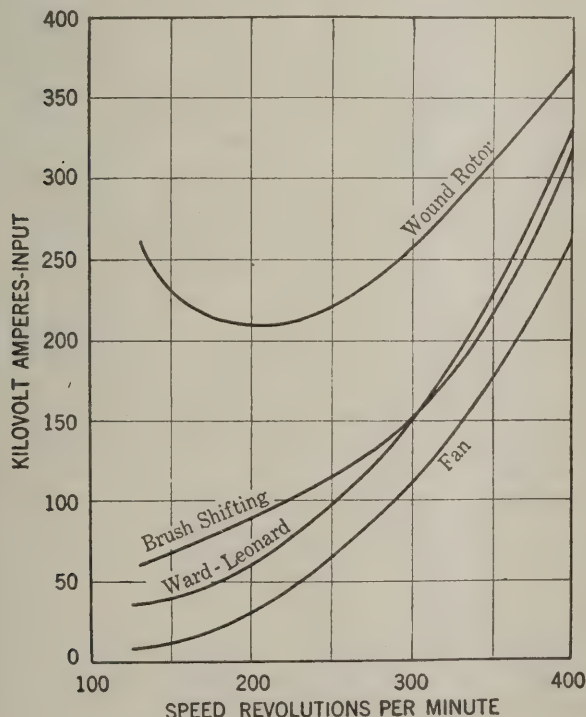


Fig. 3—Operate Fan Motors Near Full Load

The power factor of an induction motor when operated at slow speed is unusually poor. Its use is therefore best suited to fans which always run at the same speed. These curves compare various types of drives.

variable-speed control. Where two or possibly three fixed speeds are sufficient and these speeds are some common fraction of full speed, such as one-half and three-quarters, a pole-changing squirrel-cage induction motor may be used. On large drives, however, wherever variable speed is required, intermediate speeds are usually necessary. This makes the use of a squirrel-cage motor impossible.

For variable-speed fan drives, we have the slip-ring motor with controller and resistance, the brush-lifting alternating-current motor, the Scherbius and Cramer systems of drive with various modifications and perhaps the Ward-Leonard control.

#### OPERATING CURVES COMPARE MOTORS

Fig. 2 shows the power required at the fan shaft for a given fan at various speeds from minimum to maximum. On the same sheet are shown the powers consumed to drive this fan at the various speeds using first the slip-ring induction motor, second the brush-

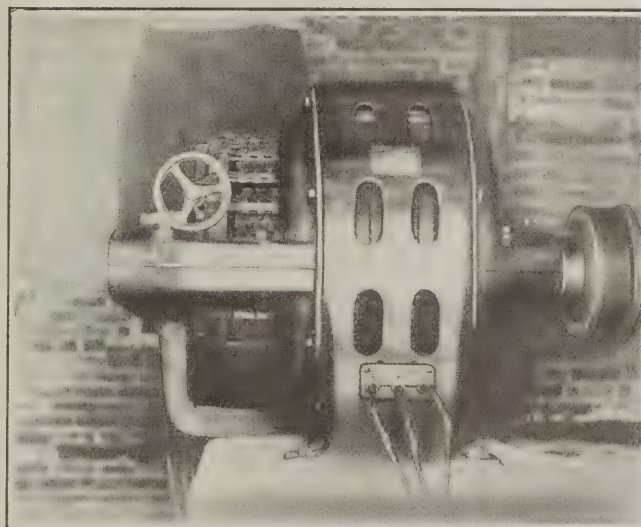


Fig. 4—High Power Factor Type of Fan Drive

This motor is designed to give good power factor even when operated at slow speed. By shifting the brushes on a specially designed commutator many different speeds are obtainable.

lifting motor and third the Ward-Leonard system of control. As the power factor of the slip-ring motor falls quite rapidly at light loads, curves are also shown in Fig. 3 giving the kilovolt-ampere input under the same conditions. Other sizes of fans and other speed variations may change the relative values of these curves. It is only necessary to capitalize the saving of one over the other to determine which is the cheapest form of drive.

Reliability is, in many installations the controlling factor in the choice. The slip-ring motor perhaps has a little the best of this argument, there being only one motor involved and no commutators or other mechanism beyond the control and resistance. The other systems, however, are reliable and have been installed on a large number of fans.

The curves shown in Figs. 2 and 3 do not take into account the efficiency of the fan proper. This efficiency is just as important as the efficiency of the motor. For instance, the majority of fans will increase in efficiency up to a certain speed and beyond this speed the efficiency falls off rapidly. Thus a most efficient motor might be selected, but because the fan was being operated at a speed at which it was inefficient the



overall efficiency of the installation might be low. The prospective purchaser is strongly urged to make a thorough analysis of his fan and drive requirements before obligating himself beyond recall. A small percentage difference in efficiency is much more serious in the case of a fan than in almost any other motor application about the mine. The fan runs continuously and therefore the kilowatt-hours consumed pile up at an amazing rate so that a small per cent saved by improving the efficiency of this drive nets the operator a large return over the year.

#### AUTOMATIC OPERATION FOR FAN DRIVES

In this day of automatics, fan drives have received their share of attention. They may now be built to start automatically upon the return of power after an interruption and to shut down and notify the officials in case of hot bearings or excessive temperatures in any part of the apparatus. They can be started and stopped by remote control.

Motor-driven fans, if properly designed and installed, are thoroughly reliable and economical pieces of machinery. The fan load is ideal from the power-supply standpoint. It is usually steady for 24 hr. a day and seven days a week. From the operator's standpoint it helps materially to improve his load factor. Fig. 4 shows a brush-shifting motor directly coupled to a high-speed fan.

## Britain Drastically Revises Its Shotfiring Rules

**Shotfirers Must Be Certified and Must Not Be Paid  
Tonnage Rate—Coal Dust Must Be Treated  
Before Shooting**

CONVINCED by the explosions at the Haig, St. Helens, East Pleau and Wheldale mines that the laws relating to shot-firing need amendment, the Board of Trade of Great Britain, that has what amounts to legislative powers, has amended the "Explosives in Coal Mines Order" of Sept. 1, 1923, and the rules now provide that persons engaged in shotfiring must be competent and appointed in writing by the manager to perform that task. No shot shall be fired by any other person.

Men are disqualified if their wages depend on the tonnage of coal gotten, and no shotfirer not employed in that manner prior to the order being put in force shall be qualified for appointment unless he is the holder of a first- or second-class certificate of competency under the Coal Mines Act, 1911, or is 23 years of age or upwards and has had at least five years practical experience underground in a mine of which not less than two years have been at the face of the workings of a mine. Furthermore he must have obtained like certificates, as to his ability to make accurate tests for flammable gas and as to his eyesight, as are required in the case of firemen, examiners or deputies by section 15 of the Act. However, where flammable gas is not known no such requirements shall be made.

And now as to shots, the order says that no shot shall be fired unless, immediately before the shot is fired, the shotfirer has examined, with a locked flame safety lamp of approved type or with other apparatus approved for the purpose by the Board of Trade, the

place where the shot is to be fired and all contiguous accessible places within a radius of 20 yd. from the place and has found them clear of flammable gas and in all respects safe for firing.

This examination should be extended to ascertain if any flammable gas is issuing from the shothole or from any break within a radius of 20 yd. If within that radius there is any cavity that may contain flammable gas and cannot be examined, or any break where an examination cannot be made for flammable gas issuing from it (other than inaccessible cavities or breaks in the gob, goaf or waste) the shot shall not be fired. These requirements also shall not apply to mines in which flammable gas is not known.

#### THOROUGH DUST TREATMENT REQUIRED

Another provision requires that no shot shall be fired until the place, floor, roof and sides of all contiguous accessible places within a radius of 5 yd. from the place where the shot is to be fired have been thoroughly treated with incombustible dust or with water or in such other manner as the Board of Trade may approve. If the place where the shot is to be fired is in or near the coal face and not more than 10 yd. from a road which has been so treated under the General Regulations of July 30, 1920, the treatment shall, in addition, be made continuous from the road to the shothole.

There are exceptions, however, that come into effect if the manager or undermanager has satisfied himself as regards any part of the mine that the natural conditions for the time being in respect to the presence of incombustible dust and moisture render any coal dust harmless. In that case he may give the shotfirers concerned special permission in writing to dispense with the foregoing precautions in that part of the mine. But to make it clear that the precautions are not being taken, a copy of every such permission must be posted at the head of the shaft and the copy must be forwarded to the inspector of the division at least seven full days before the permission becomes operative. If any question arises as to what dust is harmless the decision of the inspector of any division shall be final, subject to an appeal to the Chief Inspector of Mines, and pending the settlement of the question no permission given shall be operative without the consent of the inspector of the division.

#### FORBIDS UNNECESSARY SHOOTING

Furthermore it is provided that two or more shots shall not be fired in the same place simultaneously and that if two or more shotholes shall have been placed in such a manner that the firing of one shot would be likely to relieve any part of the work to be done by another, each shot shall be fired before any other of the shotholes is charged.

However, if the shots are placed in a longwall face and are fired between shifts and for their shooting require more time than the working shift affords this rule does not apply.

These rules about the shooting of two or more shots concurrently or charging two or more at one time when one depends for its action partly on the work of another does not apply in the driving of rock headings or in sinking shafts provided that the regular precautions are taken and that in rock headings no more than three shots are fired simultaneously unless they are fired electrically in series.



# Planning an Efficient Rock Pulverizing Unit

It Should Have a Preliminary Crusher, Possibly a Dryer, and a Pulverizer of at Least 1 Ton Per Hour Capacity Producing Dust of 95 Per Cent 60-Mesh and 60 Per Cent 200-Mesh Fineness

BY L. H. STURTEVANT  
Boston, Mass.

SO MUCH interest now centers on rock dusting of coal mines that many mining men are considering the vexing question: How fine should we grind rock for our use? What sort of equipment should we install? How elaborate a plant is essential? To aid in the solution of these problems the opinion is here expressed that for an average mine, 95 per cent of the rock dust produced should be of 60-mesh fineness and 60 per cent of it should pass through a 200-mesh screen. The preparation equipment to produce it should include a preliminary crusher, possibly a dryer, and a pulverizer of at least one ton per hour capacity driven at slow speed by a motor of about 25-hp. rating. The whole plant might be housed in an 18x24-ft. building. The reasons for adopting such equipment will be explained later in this article.

Experience both here and abroad has proven conclusively that the principle involved in protecting coal mines with rock dust is a sound one and should be adopted wherever coal is produced by underground mining methods. This should be done not only on humanitarian grounds but for economic reasons as well—saving the expense caused by explosions, reducing the high cost of insurance and for other considerations.

Many varieties of rock when suitably pulverized are adapted to this purpose. In order to be suitable, however, such rock should be free from carbonaceous matter and contain only a small amount of free silica, which is injurious to the health of workers. It should preferably be of a light color so as to aid in mine illumination, but above all it should be ground to a fineness sufficient so that when distributed throughout the mine it may be thrown into a cloud in the air under the action of an explosive wave. Limestone, gypsum, anhydrite, talc and shale, provided they are free from sand or flint, answer the purpose admirably.

Rock after pulverization should be applied to all haulage roads, cross entries, secondary entries, room necks, rooms, airways and, in fact, wherever coal dust lodges. It should also be installed in barriers at the mouths of panels, cross entries and other strategic positions. The amount that should be applied is that quantity necessary to dilute the coal dust already deposited to such an extent that the combustible content of the resulting mixture will not exceed 45 per cent. After the first application of rock dust careful sampling will determine the proper interval of time that should elapse between redustings. It also will show the amount of dust required to reduce the combustible content to the permissible maximum.

In gaseous operations from 5 to 10 per cent excess of rock dust should be applied for each per cent of methane present in the mine atmosphere. No definite rule can be laid down as to the actual quantity of dust required per square foot of mine area. But for the average operation a grinding plant producing from 1 to 2 tons per hour should be of ample size. As a matter

of fact this is about the smallest reliable grinding plant procurable. Mines usually require from 2 to 3 tons of dust per mile of heading or room treated.

## ONE TO TWO TONS PER HOUR SHOULD BE ENOUGH

Should the capacity of such a grinding plant be too great for individual requirements if operated constantly, it might be run a sufficient portion of the time to produce the necessary dust rather than to install an inferior equipment or one not rugged or strong enough to withstand continuous service. One attendant to feed the rock to the primary crusher is all that should be necessary to operate a unit of this or even a larger size.

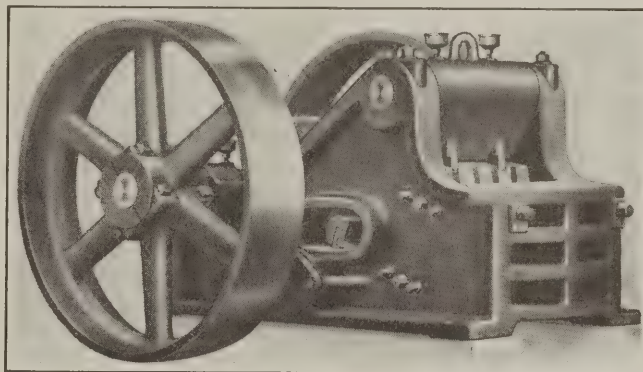


Fig. 1—Jaw Crusher Making First Reduction

Unless the rock comes to the crushing plant in small pieces it is advisable to pass it through the crusher as a first operation. Such a crusher as here shown reduces the rock to suitable size for the pulverizer and saves the labor necessary to break down the rock by means of hand sledges.

If the rock coming to the crusher plant contains much over 2 per cent of moisture it sometimes becomes necessary to install and operate a dryer between the crusher and pulverizer.

Some difference of opinion has been expressed regarding the fineness to which rock dust should be ground. English coal operators specify that 100 per cent shall pass a 28-mesh screen and that 50 per cent shall pass a 250 mesh screen. American opinion regarding this requirement varies from 100 per cent passing 20-mesh screen, of which 50 per cent should pass a 200-mesh, to 100 per cent passing a 50-mesh screen, and 70 per cent passing a 200-mesh sieve. Some recommendations in fact specify much finer dust than has been named.

There seems to be every reason to believe that the finer the dust is ground the more readily can it be applied and the more easily will it be raised in the air along with the coal dust to prevent the propagation of flame. The finer the dust is ground, however, the more costly it is to produce. So that all things considered it is believed that 95 per cent passing a 60-mesh screen, of which approximately 60 per cent will pass a 200-mesh screen, is a practical fineness. This is also one that is reasonably cheap to produce, easy and effec-



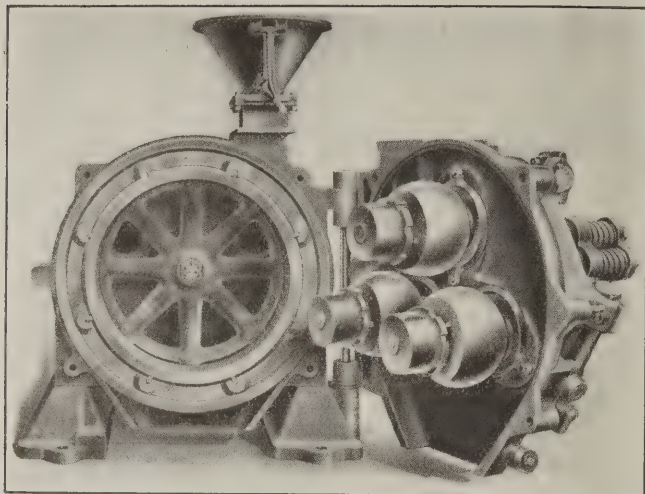


Fig. 2—Pulverizer Giving Ready Access to Internal Parts

In this machine material to be ground is fed to the inner surface of a steel ring against which it is held by centrifugal force. The heavy rollers shown to the right are pressed against the material by means of springs. As they never touch the steel raceway they grind the rock by crushing it upon itself.

tive in application and efficient in preventing catastrophies.

While different rocks vary greatly in the amount of 200-mesh dust yielded in the pulverizer, it is believed that in most instances it will be necessary to grind to at least 50 or 60 mesh, in order to secure the required amount of 200-mesh "floats" in the product. Consequently it would be unwise to install any equipment that would not meet these specifications.

Any new proposition offering remunerative possibilities brings forth innumerable devices guaranteed to fulfill all requirements at small cost. Rock dusting will be no exception to this general rule. As a matter of fact the specifications above outlined form a definite proposition which is not altogether unusual. Standard equipment therefore can and should be utilized if long experience in rock grinding is to be taken advantage of.

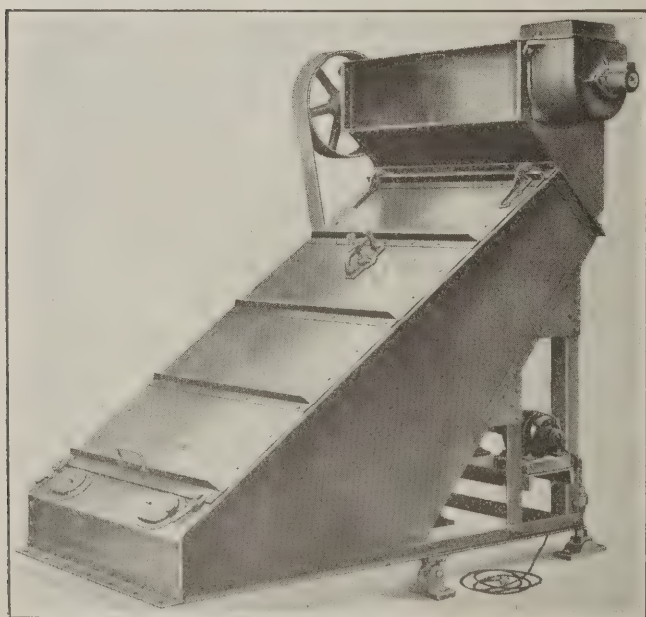


Fig. 3—Independent Vibrating Screen

After the material has been reduced to proper size in the crusher it is passed over a screen of this kind or subjected to air separation. Either device separates the material of proper fineness from the oversize which is returned to the crusher for re-treatment, while the dust goes to a suitable storage bin. This latter device is inclosed and made dust-tight.

Certain lines of pulverizers are already on the market which represent many years of experience and which are favorably known throughout the world. Several varieties and types of grinding machines of this kind have been developed. These embrace devices ranging all the way from the ancient millstone down to the most modern hammer and roll mill. They can be had in high, low and medium speeds and consequently any reasonable requirement may be fulfilled without difficulty.

#### PULVERIZATION TO 60 OR 80 MESH DESIRABLE

After a careful study of the situation and the results desired, particularly in view of the great desirability of securing a dust of 60 mesh or finer, in order to save installation costs as well as in view of probable government regulations as to fineness, it would appear wise to install a pulverizer that attains its maximum effi-

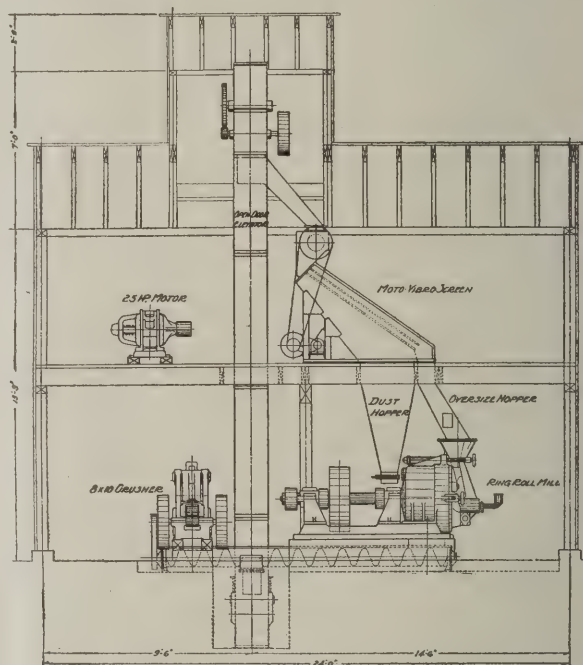


Fig. 4—Longitudinal Section of a Dust Plant

All equipment necessary to fulfill the dust-grinding requirements of the ordinary mine, including crusher, elevators, pulverizer, screen, spouting and bins, can be housed in a building 18x24 ft. in plan and 15 ft. high to the square. If a drier must be interposed between crusher and pulverizer more space will be necessary.

ciency when producing from 60- to 80-mesh material. At the same time, however, the machine should consume a minimum of power, require only occasional repairs and be as nearly foolproof as possible so that it may be operated by any intelligent man. To meet these requirements slow speed is a primary essential, for this in itself signifies durability. An example of a machine of this type is the open door ring-roll mill, shown in Fig. 2. This machine is fitted with a ring revolving at a comparatively slow speed onto the inner surface of which incoming material is fed. Here it is held by centrifugal force resulting from the ring's rotation.

Upon this layer of material either one or three rolls are strongly pressed and are revolved by the friction against the material itself. They never come in contact with the inner surface of the ring and as a result the material is crushed by pressure upon itself and is free to discharge from either side of the ring into an elevator by which it is carried to an independent inclined screen electrically vibrated, or to an air separator.



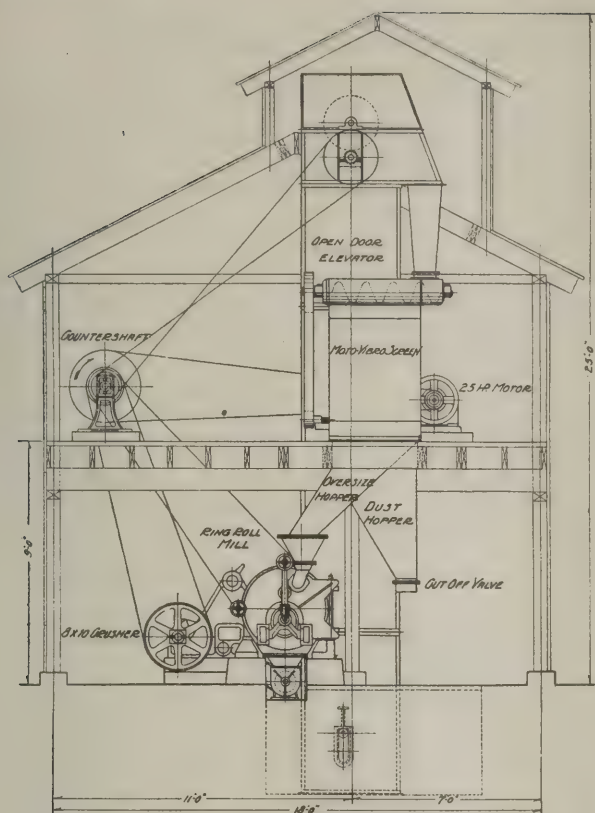


Fig. 5—Transverse Section of Dust Plant

The extremely simple arrangement of machinery is here apparent. All the various machines may be driven from one counter-shaft. One man, who feeds the rock to the crusher, is all that is required to operate a plant of this type.

Either machine will remove the fine material made by the pulverizer, the oversize being returned to the mill for repulverization.

When treated by this method a reasonable amount of moisture in the rock does not seriously affect the grinding capacity of the plant. Furthermore, each machine working independently of the other operates with maximum efficiency. Each is completely accessible for inspection or repair. Inasmuch as the finished product must necessarily be elevated in any case in order to be placed in a hopper or bin at sufficient height to permit its easy withdrawal when needed, no additional expense is necessary for carrying it to such a container, as the discharge from the screen or air separator leads directly to it.

#### ONLY 25 HP. REQUIRED FOR ROCK PULVERIZATION

Such a plant is capable of reducing all the rock to 20 mesh and finer. On the other hand it can be made to produce a 300-mesh product by simple adjustment. Consequently, through the installation of such a pulverizing unit at the present time, any future regulations by government agencies either national or state can readily be complied with.

Whatever pulverizer is used, a preliminary crusher should be installed to reduce the initial rock to suitable size and thus save the amount of labor necessary for sledging large pieces. A crusher having a jaw opening of not less than 8x10 in. should be employed, as this is about the minimum size that will eliminate hand labor. A complete plant, therefore, will consist of one 8x10-in. crusher, one No. 0 Ring-Roll mill, or its equivalent, one elevator and one vibrating screen or an air separator, of a capacity of from 1 to 3 tons per hour

depending upon the rock treated and the fineness of the finished output desired. Such a plant would require a motor of about 25 hp. for its efficient operation. On the other hand a unit might be installed with any reasonable size of machines or any reasonable capacity, grinding to almost any fineness. If no dryer is necessary between crusher and pulverizer a plant of the size I have mentioned could be placed in a building approximately 18x24 ft. in plan with a height of 15 ft. to the square.

Naturally other equipment not mentioned here should be installed in any plant of this kind. This would include such items as airtight spouts, hoppers and connections, electric wiring, possibly transformers and the like. Standard design for such equipment has, however, been perfected and demands for these various items, including even buildings, labor supervision, erection, installation and preliminary operation, can be filled by a single company. The entire responsibility for both design and results may thus be confined to one concern of wide experience in the manufacture and operation of crushing and grinding machinery.

## Europe Is Developing Some New Methods for Washing Coal

Most Promising Ones Employ Pulsating Jig with Double Rock Discharge, an Oil Froth in Vacuum or an Air Suction Dryer

BY C. H. S. TUPHOLME  
London, England

ONE NATURAL result of the shortage and high price of coal in Europe has been the development of a number of coal-washing devices. Many of these have not yet progressed beyond the experimental stage, but the colliery owner who would keep pace with modern progress in coal-cleaning methods must devote a large portion of his day to digesting reports, articles and patent specifications in order to be in a position to distinguish between the practical and the purely theoretical. One or two processes, however, are now being tried out that promise some degree of commercial success.

One of these, according to the Ateliers de Construction de la Basse Sambre, of Belgium, possesses certain marked improvements over the general run of pulsating or plunger-type washers. In this device a single screen is located at some distance from both the front and rear walls of the washer body, the object of the new machine being to secure a regular discharge of the heavier refuse immediately at the rear of the screen, the discharge of the lighter pieces of rock at the front of the screen, and a uniform operation of the plant irrespective of the rate of feed of the raw coal.

#### ADJUSTABLE GATES CONTROL ROCK DISCHARGE

These results are achieved by providing gates of adjustable height at either end of the screen. The heaviest pieces of rock are discharged automatically at the end near the pulsating plunger while the lighter refuse is discharged similarly at the other end of the screen. These two classes of rock form a barrier against the coal in front of each of the gates and pass into separate compartments filled with water to the same level as that in the screen compartment. Thus the washer is never allowed to run dry. The washed



coal is discharged over the barrier composed of the lighter rock.

Fig. 1 is a cross-section of the washer, and Fig. 2 a partial section along the line A-B of Fig. 1, looking toward the front of the washer. Feed reaches the machine by way of the chute 1, located above the plunger chamber. This delivers the raw coal to the washing bed on the screen, 3. Communication between the piston chamber and the screen is made by way of the openings, 10.

#### COAL DISCHARGED AUTOMATICALLY

Discharge of the coal is effected automatically by the adjustable gate, 2. This is approximately V-shaped with one branch vertical, the height being controllable for varying the thickness of the bed on the screen. The heavier pieces of rock are separated immediately at the rear end of the screen and pass out under the adjustable gate, 4. Such pieces form a barrier the height of which is determined by that of the gate in front of the lip, 6.

Each piece of rock as it arrives at the gate drives out another at the top which then drops into the funnel-shaped pipe, 7, by which it is discharged to the bucket elevator 8 which withdraws it from the machine. Inasmuch as the heavy pieces of rock are discharged immediately on entering the machine, a more homogeneous washing bed and more uniform water pulsations are secured. This results in an improved yield.

Since the gates extend across the full width of the washer the liability of the machine becoming obstructed by foreign bodies is eliminated. Material passing through the screen, 3, is discharged at the bottom of the washer by way of the pipe, 9.

The lighter refuse, which ultimately is rewashed, is

discharged at the front end of the screen by passing under a gate, identical with that at the rear, and passing by way of the pipe 11 to the bucket elevator, 12. Since the products are discharged into separate compartments which are themselves filled with water to the same level as the washer itself, the main machine cannot be emptied in the course of normal operation.

The advantages of this type of washer may be summarized as follows: (1) The discharge of the heavier rock particles is effected at the rear end of the screen so that wear upon it is minimized. (2) The rock chutes have the same width as the washer so that a piece of iron or other foreign material can easily pass away. (3) The quality of the finished product is consistent irrespective of the feed of raw coal because the outlets are so dimensioned that the washer does not become choked with waste material. (4) Washing is regulated by adjusting the gates to a height that will yield the desired results.

#### COAL TRAPPED IN OIL-FROTH CREATED IN VACUUM

In another process, invented by a British engineer, an oil is employed which coats the coal particles and permits their separation from waste. This method is applicable to the separation of coal from finely-divided refuse through the medium of a froth in which the coal particles are trapped but from which the gangue is excluded.

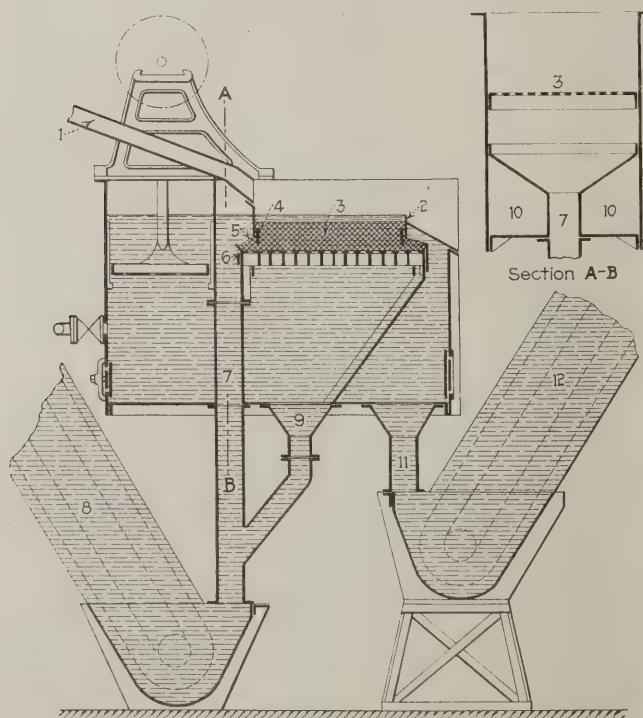
Finely crushed material is mixed with water and an oil miscible with water such as cresol, paraffin oil, or wood tar. The mixture is then violently agitated in a closed chamber within which a partial vacuum is maintained. In some cases also air or gas is introduced into the mixture. By this means the coal particles become thoroughly coated with oil in which condition they are discharged to a tank containing water under atmospheric pressure. Here the coal particles entrapped in bubbles of froth rise to the surface while the rock particles settle to the bottom. The agitator employed in this process is a simple rotary stirrer.

#### CHEMICAL REAGENTS ENTIRELY UNNECESSARY

The advantages claimed for this process are: The elimination of all chemical reagents required in similar processes to effect a thorough wetting of impurities and prevent their rising into the froth with the coal. The reagents most commonly used in processes of this kind are, sodium silicate, caustic soda or similar substances of an alkaline nature. In the method just described such reagents are unnecessary because of the partial vacuum under which agitation is conducted. By this means the small rock particles are as thoroughly bared and wetted as in processes employing an alkaline reagent.

Still a third method of fine coal recovery is a German invention and is intended to effect the reclamation of fine coal from the sludge of colliery washeries. In most cases considerable difficulty attends the drying and recovery of such fine coal as it forms a compact mass that holds water tenaciously.

In this process the fine material is flushed onto a perforated floor or platform, in many instances in successive layers, the finest material being on the top. Creating a partial vacuum above the bed of material thus formed draws air upward through it. By this means the fine material can be dried to any desired degree.



Figs. 1 and 2—Sections of New Jig

This washing device is peculiar in that it has two points or gates through which slate and other refuse is discharged. One of these is at the front of the machine and through it the heavier and larger pieces of rock escape. The other is at the rear of the screen and through it the smaller and lighter pieces of refuse find their way. This relieves wear on the screen as well as resulting in a cleaner and more uniform product.



# No Unnecessary Pipe Fittings in This Pump Station

Single-Stage Centrifugal Pumps Are Connected in Series — Units Rated 400 H P., 4,200 Gallons Per Minute, 285-Ft. Head — Brick Lined Duct Connects Pump House with 60-Acre Sump

BY J. H. EDWARDS  
Associate Editor, *Coal Age*  
Huntington, W. Va.

**A**BOUT EIGHTEEN months ago the Keystone Coal and Coke Co., of Greensburg, Pa., put into operation the first two units of its new central pump station. Simplicity and reliability were the prime factors governing the design and installation. The plant has attracted attention not only because of the mechanical features but also because of its large sump area, and the extensive territory drained.

The new pumping station is located at the Crows Nest mine which is at the lowest point of the Greensburg basin and very close to its center. This coal area is about twelve miles long, and its greatest width is approximately four miles. All mines except one in this Greensburg district are operated by the Keystone Coal and Coke Co., and in the territory the Pittsburgh seam, which is the one being mined, pitches gradually from all directions toward the center. This affords natural drainage to the central pump station from all mine workings, some of which are six miles distant. Before plans were made for a new pumping plant the possibility of a tunnel to secure natural drainage was considered, however, this was found impractical due to the fact that the method would require a tunnel over eight miles in length.

Although located at a point which makes it possible, it was not the intention to have the new plant displace any of the other six pumping stations, but rather to have it act as a reinforcement to all. It regularly handles the water from the Crows Nest mine and, in addition, any surplus from the other mines which may be caused by excessive inflow or failure of other pumps to operate.

The large sump capacity at the new pump station is a noteworthy feature. Nearly sixty acres of mined-

out area is used for this purpose. The station is located some distance from the low point, a duct 10 ft. wide and 1,500 ft. long being used to carry the water by gravity to the sump which supplies the large centrifugal pumps.

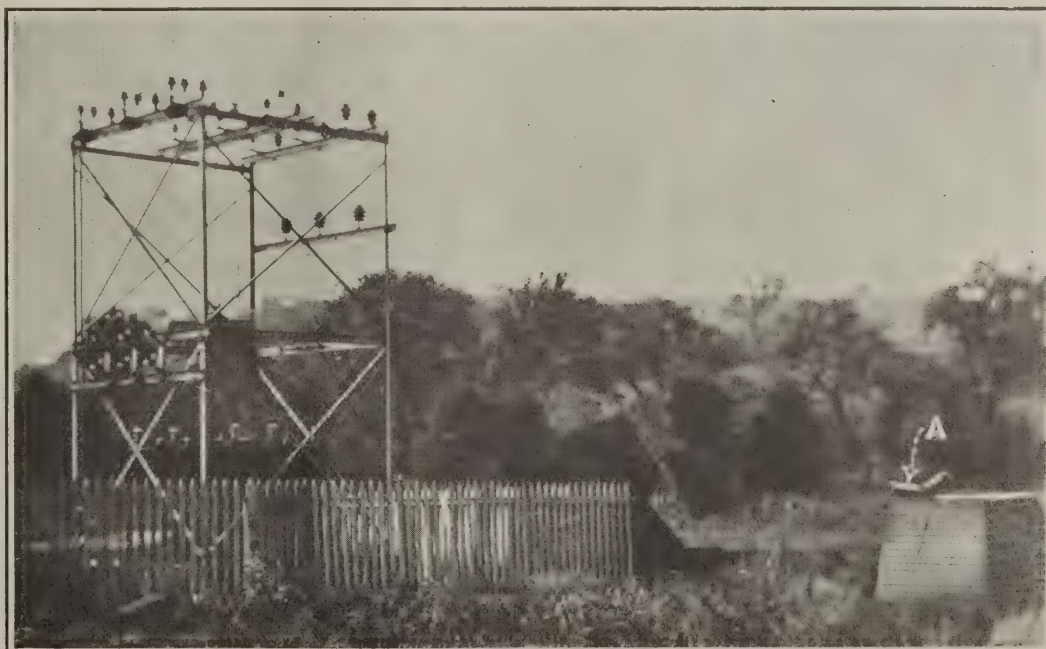
The pumproom was designed for an ultimate installation of five units. However, up to the present, space for only four is provided and of these only two have been installed. The walls of the sump, pump room, and check valve compartments are built of brick, 13 in. thick except in the compartments where 9 in. was considered sufficient. Concrete was used for the bottom of the sump and for the floor and foundation in the pump room. The roof is made of brick laid between 4-in. steel I-beams which in turn are supported by 12-in. I-beams, 20 ft. long, set about 5 ft. apart. The room was made 13 ft. high, this in order to accommodate a traveling crane the runway of which is supported by steel brackets set in the brick side walls.

## ARRANGEMENT FACILITATES REPAIRING

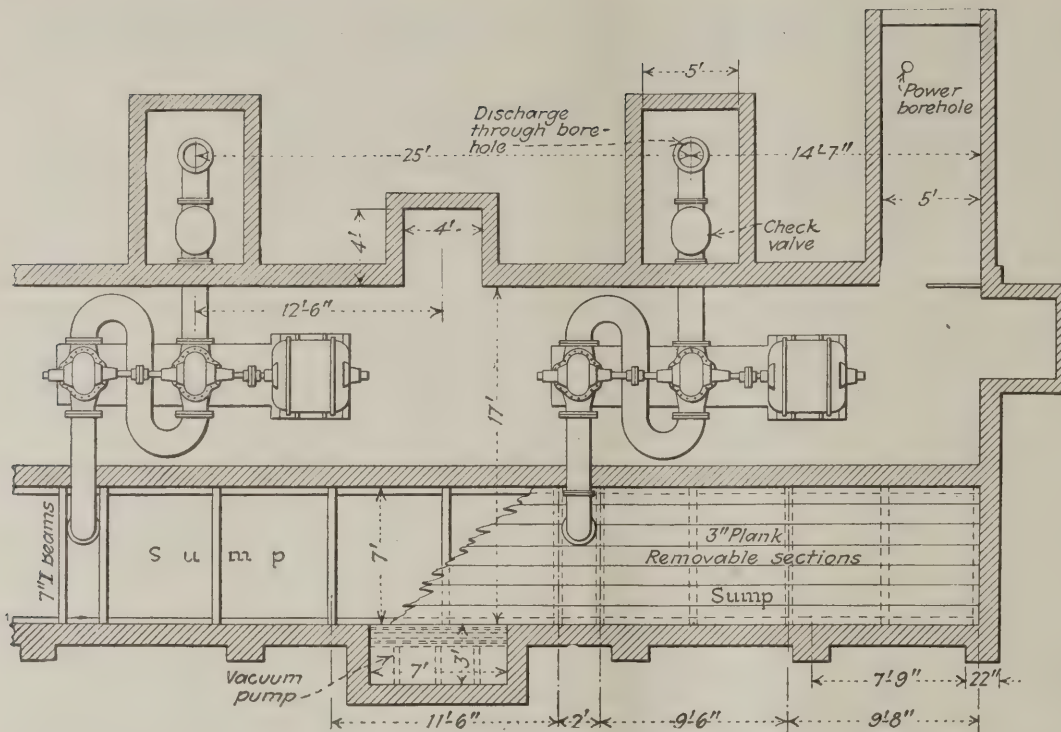
Direct-connected, motor-driven centrifugal pumps are used. These units are rated as follows: 4,200 gallons per minute, 285-ft. head, 1,150 r.p.m., 400 hp., 77 per cent pump efficiency. The motors are 2,300-volt, squirrel cage, 40-degree type and are controlled by hand-operated auto-transformer starters, equipped with ammeters for checking pump performance. In keeping with the simplicity and reliability of the whole design, multi-stage pumps are not used, but instead each unit is made up of two single-stage pumps with the shafts connected by flexible couplings so as to be driven by the one motor. This arrangement facilitates repairing and by keeping in stock one single-stage pump almost

### Pump Station Top Equipment

The object "A," lying on the wooden cover of the brick borehole top, is a 6-ft. section of corroded 14-in. casing which was forced out through a 14-in. elbow and discharged into the sluiceway. This casing, which was of extra heavy steel pipe, has been reduced to a mere shell in less than two years. Wires leading to the power borehole can be seen at the right of the steel structure.







### Pumps at New Station

Two interchangeable single-stage centrifugal pumps connected together make up each unit. There is a good sized opening around the discharge line into the valve stall, allowing ample room for making repairs. Plans call for a room 129 ft. long, accommodating five pumps. Space for four has been completed, but only two units are installed.

certain protection is provided against long shut down due to a pump failure.

The high acid content of the mine water made necessary special precautions to minimize the effect of corrosion. The pumps are built of acid-resisting bronze. Wood lined 14-in. cast-iron pipe is used between the pump discharge and the bronze spud which enters the borehole. Plain cast-iron pipe forms the 14-in. suction lines. The bronze spud mentioned is 6 ft. long, and somewhat over 4 ft. of it is cemented into the rock.

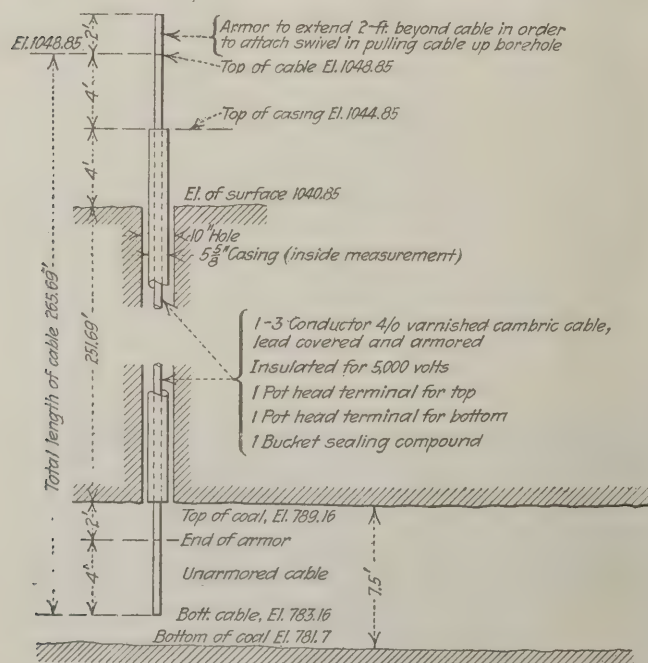
The two 256-ft. discharge holes were drilled approximately 18 in. in diameter, then cased with 14-in. extra heavy steel pipe clear down to the bronze spud. The

casing was then surrounded by concrete for the entire length, providing a smooth concrete duct to serve if the casing rusts away. Extra heavy pipe was used as casing for the sole reason that it was on hand, having been removed from discontinued power plants.

When the photographs here reproduced were being taken it was a surprise to find a 6-ft. length of mere shell of the 14-in. pipe lying in the wooden sluiceway which conducts the discharged mine water to a near-by creek. This shell was so thin that the force of the water had crushed and bent it sufficiently to make it pass out through the elbow of 14-in. radius at the top of the hole. The complete destruction of this extra heavy pipe after less than two years' service indicates the acid condition encountered.

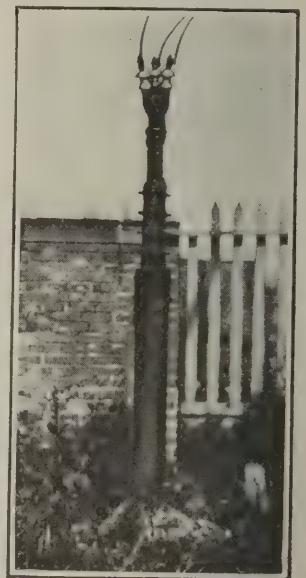
Returning to a consideration of the pump room arrangement we see several features of interest. All foot valves, gate valves and the like are eliminated from the main lines. The only ones used are special, heavy-type check valves connected in the discharge. This check valve of each unit is located in a separate brick compartment, as a precaution against possible wetting of the electrical equipment in case of a break. In the valve compartment all draw slate and loose material was taken down so that the bronze borehole spud could be cemented into solid sandstone.

Priming of the 14-in. centrifugal pumps is accomplished by a 3-hp. chain-driven, vertical vacuum pump. It is the intention to equip the station with another



### Power Borehole and Cable Dimensions

This sketch was made from the drawing and bill of material which was submitted to the manufacturer who furnished the cable and pot head. Note that the details of armor length at the cable ends are carefully specified.



### Cable Pot Head

A thick coating of pitch covers the pot head on this 2,300-volt armored cable and its junction with the 5 3/8-in. casing.

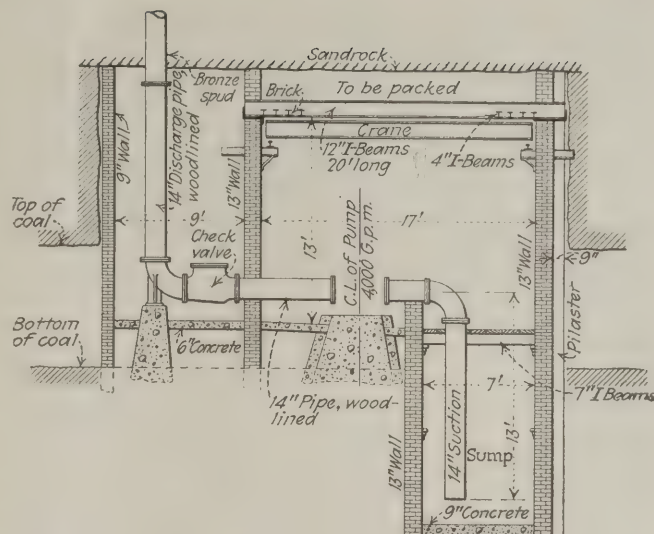


similar pump at a later date after one or two more of the large units are installed. The average suction head on the pumps is 10 ft., and the discharge 259 ft., making a total of 269 ft., not including the added resistance due to friction.

As mentioned before, each motor starting panel is equipped with an ammeter. The scale of each is marked with a red line at the point of normal efficiency for that pump. Assuming that the regular current taken by a motor is 25 amp., then a change in demand to 22 or 23 amp. indicates a decrease in pumping efficiency probably due to a worn pump or pipe line obstruction. Such meters are being used in the older pumping stations as well as in the one here described.

Electric power for the two 400-hp. motors is carried down through a borehole at 2,300 volts. The 25,000-volt to 2,300-volt step-down transformers are located within a few feet of the hole. A three-conductor, No. 0000 B. & S. gage varnished cambric, lead covered and armored cable is used, and is suspended from a pot head which in turn is supported by being mounted directly on top of the 5½-in. casing. The borehole, which is 251 ft. deep, was drilled 10 in. in diameter to allow space for a 2-in. thickness of concrete which was poured in the hole to surround the casing for its entire length.

The upper pot head, being out in the weather, was covered with a thick coating of pitch to prevent water



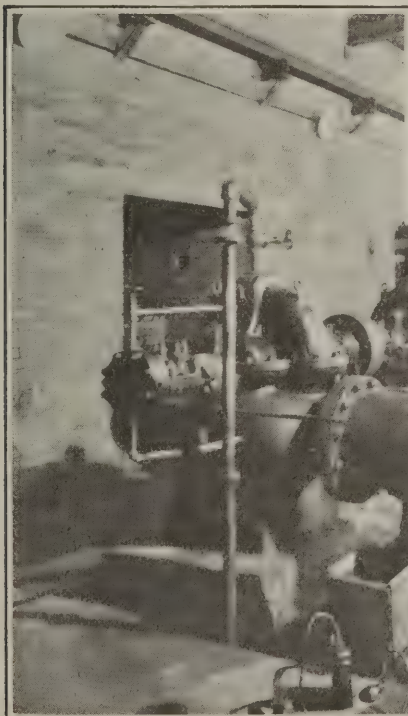
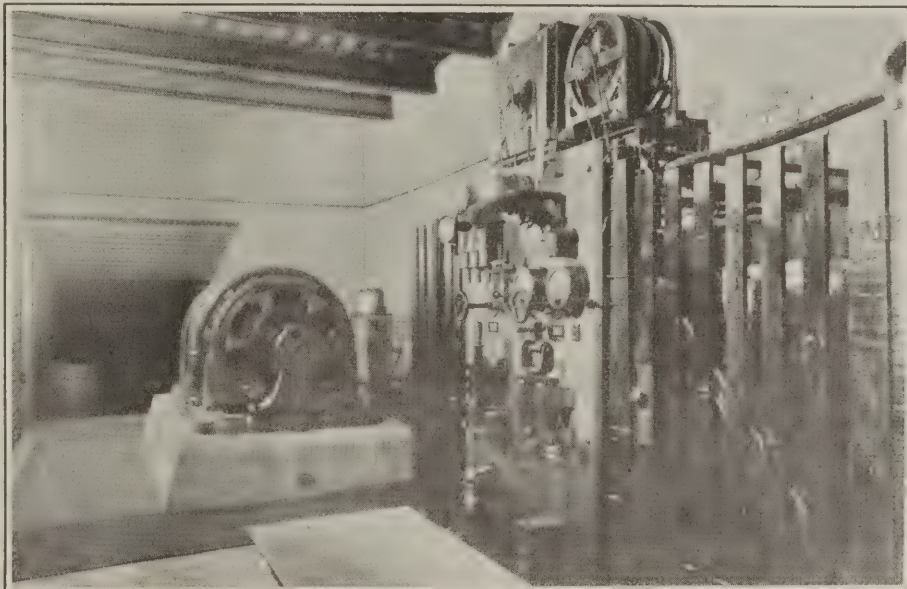
#### There Is Only One Valve Per Unit Here

The check valve is in a separate brick compartment. This minimizes the chance of wetting the electrical equipment, should the valve body break. The 13-ft. ceiling allows ample clearance for taking full advantage of the overhead traveling crane when repairing equipment. The roof is made of brick laid between 4-in. I-beams. The weight is taken by 12-in. I-beams set about 5 ft. apart, the roof span being 17 ft.

from entering the casing. Apparently every reasonable precaution has been taken to insure reliability; however, it is the intention to install a duplicate cable.

#### Substations and Pumps Are Co-ordinated To the Best Advantage

If the pumping load of a mine can be applied during off-peak periods large savings can be realized in power bills. At the Keystone Coal and Coke Co.'s mines every effort has been made to do the pumping either during the night or when power demands are low during the day. Accurate records are kept at all the substations to determine when the pumps can be run and yet not unduly raise the maximum demand.



#### Bronze Pumps and Wood-Lined Pipes Necessary for this Water

Each pump consists of two single-stage units designed so that they can be repaired as easily as possible. There is no need to disturb the whole pump when any part must be examined or replaced. Squirrel cage motors drive each of the two pumps now installed, thus the control equipment has been made simple and easy to operate. A vacuum pump is used to prime the units whenever the sump must be pumped down.



In order to check present performance and to predict future requirements, daily records are made of rainfall and pumping. The pump station records, which are kept of the new central plant and of the old stations as well, include gallons pumped, also total hours and actual periods of the day each pump is in use. Table I

Table I—Pumping Capacity at Greensburg Operations

Mine	Gal. Per Minute
Crows Nest (Central Pumps).....	8,400
Crab Tree .....	7,800
Hannastown .....	12,900
Forbes Road.....	3,400
Salem .....	7,900
Keystone Shaft .....	10,900
Hempfield .....	9,000
Seaboard Shaft .....	13,000
Total .....	73,300
Maximum gallons pumped in one month, 862,000,000.	
Minimum gallons pumped in one month, 400,000,000.	

indicates the volume of water which is pumped from the Keystone mines in the Greensburg basin. It has been found that the effect of a rain is noted by in-

## Old Workings at Cassidy, B. C., Flushed with Fine Rock

Hope to Prevent Spontaneous Combustion—Borehole  
Sunk Through Quicksand and Solid Rock—Stow-  
ing Material Carried Underground by Flume

BY JAMES B. TOUHEY

Resident Manager, Granby Consolidated Mining, Smelting &  
Power Co., Cassidy, B. C.

AT THE COAL mines of the Granby Consolidated Mining, Smelting & Power Co., some of the old workings are being flushed with broken rock to prevent spontaneous combustion. Support of surface and recovery of 100,000 tons of pillar coal by skipping and further flushing are expected to be the outcome of the experiment.

For many years mine workings have been hydraulically stowed in Europe. This method of surface support, however, has never found much favor in British Columbia, or, for that matter in any part of North America, probably because the workings have a life far shorter than those of Great Britain or Continental Europe.

When surface structures, such as railroads, towns and the various buildings necessary to coal-mine operation, are to be protected, it has been necessary to leave substantial pillars of coal to prevent subsidence of the surface. This is often inconvenient and at times expensive because of the great length of narrow work that must be driven in order to leave such supports. Within obvious limits also the nearer the coal lies to the surface, the larger must be the pillars that are left. If a river, creek or other stream crosses a property, it is always a hazardous operation to remove the pillar coal beneath it because rarely is the depth of gravel and glacial drift underlying such a stream definitely known. Of course, if a sufficient distance intervenes between the coal and the solid bed of the watercourse, no danger is to be anticipated from fractures extending upward to the water-bearing gravel.

At Cassidy, B. C., which is situated on the island of

creased pumping beginning 12 to 48 hours after, this period, depending on the amount of rainfall and condition of the soil.

An effort is made to do all pumping at hours of off-peak electric load. Pump station operators are instructed to this effect and in case an argument arises regarding the correctness of their reports, the chart of the main graphic demand meter for that mine is consulted. The pump motors are all of such size that the addition of their continuous loads to the fluctuating mine loads can be distinguished on the meter charts without difficulty. Only at rare intervals are pumps operated simultaneously with the peak day-load, these occurrences being caused by emergency or by the carelessness or misunderstanding of the operators.

Mine pumping appears to have received its due share of attention from the officials of the Keystone Coal and Coke Co. The new central pump station here described was built because the men of the company realized the necessity of having reliable drainage equipment that would meet emergencies.

Vancouver, the mines are entered from the surface by means of three slopes having an average pitch of 20 deg. The coal on Vancouver Island is quite liable to spontaneous combustion, and this forms one of the greatest dangers to be guarded against in mine operation.

When the mines at Cassidy were opened, advantage was taken of experience that had been gained at other operations in this regard, and a modified system of panel work was adopted, so that if a fire should start from spontaneous combustion or other cause in any particular panel or district, it could be quickly and effectively sealed without seriously interfering with the operation of the mine as a whole.

### VENTILATION AND STOWAGE REDUCE FIRE HAZARD

The mine was provided with ascensional ventilation so that all the old workings in each district could be ventilated by the return air from that district. Thus the returning air assisted in keeping to a minimum any heat that might otherwise be generated in the crushing of pillars.

It was finally decided as an extra precaution to stow the workings by hydraulic means. With this end in view, a slope 9 ft. wide by 7 ft. high was driven to within 63 ft. of daylight. It was planned to sink a small shaft from the surface to the face of this incline. This plan was abandoned, however, owing to the shaft encountering 11 ft. of quicksand. It was then decided to sink a borehole and case it with 6-in. steel pipe.

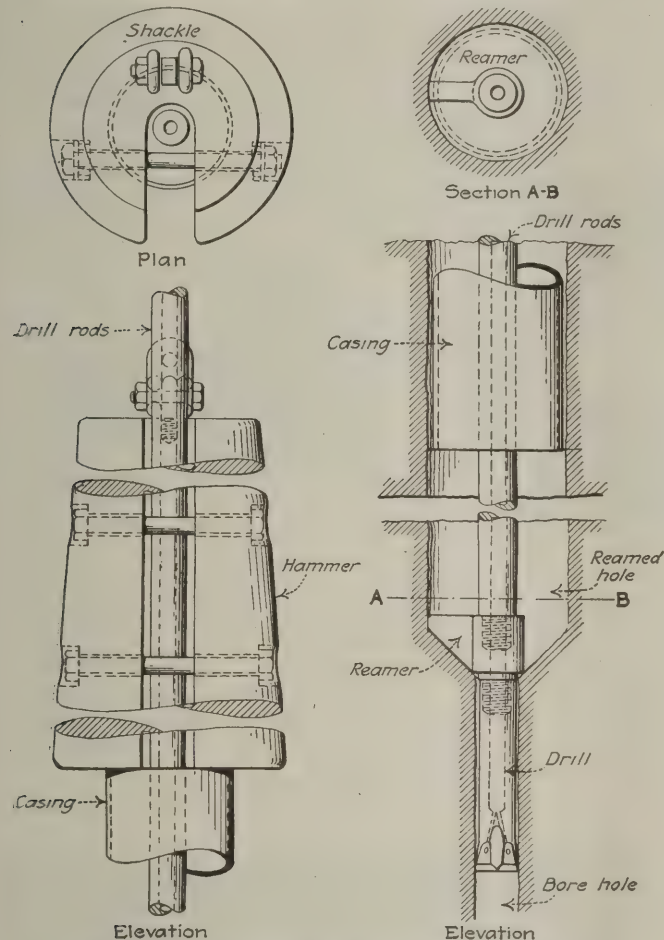
A suitable drill rig was accordingly erected, and a hammer weighing 400 lb. was used to drive the first length—10 ft. of 6-in. pipe—through the surface soil and gravel. The hollow drill rod standing in the middle of the pipe served as a guide for this hammer, which was raised by a small compressed-air hoist and allowed to fall by its own weight.

This device was manipulated as follows: The first length of pipe was put in position with a small framework about 6 ft. high holding it vertical. Water was next forced through the hollow drill rod by a 4x6-in. high-pressure pump. The rod inside the pipe with the hammer weight straddling it is shown in Fig. 1. A 1½-in. hemp rope, attached to the hammer, was



passed three times around the small drum of a hoist. In this manner the hammer was lifted about 10 in., and allowed to fall by giving slack to the rope, the hoist meanwhile being operated continuously. The force of water in the hollow guide rod was 45 lb. per square inch. This was sufficient to force the sand and gravel to the top of the pipe as it was driven downward. This method of sinking the casing was continued by attaching additional lengths of pipe until a depth of 43 ft. had been attained. Here, hardpan was encountered.

It became necessary at this point to drill the remain-



**Figs. 1 and 2—Driving Casing and Reaming Hole**

Through the surface drift the casing was driven by forcing water under pressure through the hollow drill steel and raising and dropping a heavy weight on the top of the casing as shown in Fig. 1. Fig. 2 shows how the drill hole was enlarged to the proper size to receive the casing. The hole was reamed by a "wing" bit attached to the side of the drill rod, the drill itself serving as a pilot and guide.

ing 20 ft. through hard shale. The hole must, of course, be of such size as to allow the casing to follow it down to the coal. An ordinary drill bit was made  $2\frac{1}{2}$  in. in diameter. Four  $\frac{1}{8}$ -in. holes were drilled from the flanks of the cutting edge to the hollow center. Through these streams of water were forced continually to keep the borings coming to the surface. A  $2\frac{1}{2}$ -in. hole was thus drilled to the coal and was then reamed out by an extra cutting bit fastened to the drill rod 1 ft. above the regular bit, this arrangement being shown in Fig. 2. The reaming bit extended  $3\frac{1}{2}$  in. on one side only from the center of the drill rod. It was lifted and dropped in the same manner as the hammer, thus cutting the sides of the original hole out to 7 in. in diameter, the smaller bit serving as a guide.

Inasmuch as the reaming bit extended to one side of the rod only, it allowed the two bits to be hoisted out of or lowered into the hole as required, passing up through the 6-in. pipe, the lower end of which was raised a sufficient distance above the bottom of the reamed portion of the hole to allow the  $2\frac{1}{2}$ -in. advance bit, which now served as a guide, to swing over out of a concentric position. In lowering this device back into the hole, the advance or guide bit, when it encountered the slant surface made by the reamer, would slide over into the smaller hole where it again acted as a guide, so that chopping with the reamer might be continued.

#### WATER TRANSPORTS WASHERY REFUSE TO BOREHOLE

The casing was pulled up 15 in. above the hardpan and allowed to remain in this position until the hole was reamed to the bottom. It was then lowered to the coal and secured in position on the surface. A small wooden hopper with a capacity of about two tons was next built above the borehole, the casing forming its vertex.

A flume was next constructed to carry the washery refuse to this hopper. This was made of 2x12-in. planks and lined on the bottom with  $\frac{1}{8}$ -in. iron sheets. It had a grade of 1 in 30. About eight parts of water to each part of solids was found necessary to keep the refuse flowing in this flume. Three feet away from the hopper a short length of copper screen was inserted in the bottom of the flume, after the plank had been cut out. The perforations in this plate were  $\frac{1}{8} \times \frac{1}{2}$  in., and sufficient water was drained out by this screen to prevent an excessive quantity of water passing underground. The ratio of water to solids was now about 4:1, and the slope within the mine was sufficient to carry this mixture along without the aid of fluming except where the direction of flow of the stowage material was changed or where levels had to be crossed. At present this material is being deposited in an old slope 1,100 ft. from the borehole. From this a number of rooms had been worked where because of the excessive roof and side pressure and the close proximity to a creek, pillars could not be extracted.

When this portion of the mine has been flushed full it is the intention to extract these pillars by skipping them, that is by taking slices off the sides and then filling up again after each slice. It is also planned later on to install a small rock crusher above the hopper and to crush all rock coming from the mine, which amounts to about 125 tons per day. This crushed rock—which will be less than one inch in diameter—will drop into the hopper where it will mix with the water and solids coming from the washery. This will increase the quantity of solids passing into the mine to approximately 250 tons per 8-hr. shift.

The entire cost of labor entailed in this installation, including that for drilling, was about \$350. The quantity of pillar coal that will eventually be extracted as the process of hydraulic stowage proceeds, will be approximately 75,000 to 100,000 tons. The primary object sought in stowing in this mine is the prevention of mine fires arising from spontaneous combustion in crushed or shattered pillars. Stowage will, however, prevent any appreciable surface subsidence arising from pillar extraction, shorten the distance the ventilating current must travel and prevent possible accumulations of methane.



## Coal Balls—The "Finger Prints" That Identify Coal

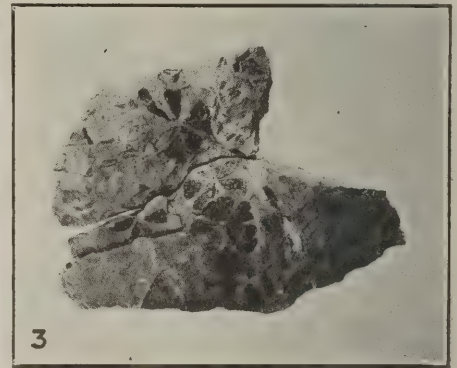
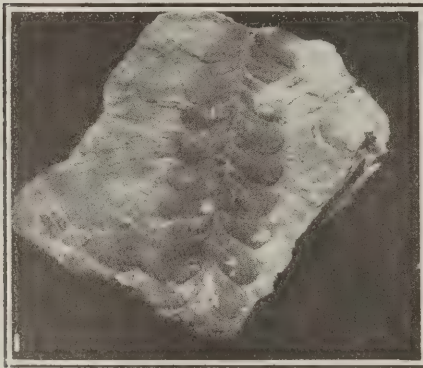
In These Limestone Nodules Fossil Plants Unerringly Establish Age and Character of Each Seam of Coal Says Noé

BY F. L. CLARK  
McGregor, Iowa

A SEARCH for "coal balls" in the coal measures of Illinois, Indiana, Kentucky and Iowa has been a particular feature of a geologic survey advanced during the past summer by Dr. Adolph Noé, paleobotanist at the University of Chicago. The first of these to be discovered in America was found in Illinois in 1922 and since then Dr. Noé has been working to develop

been made in the coal beds of England, France and Germany for a long time. Thus Dr. Noé's investigation leads him to believe that coal balls probably are fairly common in Iowa, Kansas, Missouri, and Indiana, and presumably are present in the Pennsylvania coal fields. Some of these nodules were recently found in Texas and forwarded to Dr. Noé for examination.

Of the commercial value of the discovery of coal balls of American coal-field origin and their examination Dr. Noé says, "Fossil plants, which are found in the coal fields are, as a rule, connected with definite seams, each seam having a flora of its own. Therefore, whenever fossil plants are discovered in or about a coal bed, that bed can be identified by them. It is of the utmost importance that this should be done because the commercial value of coal differs from bed to bed and the prospector must know what measure he has before him.



Figs. 1, 2 and 3—Plant Remains Found in and in Close Proximity to Coal Beds

Heretofore it has been believed that the coal beds were formed from dense masses or bogs of ferns, club mosses, horsetails and other plants of a low order of vegetation. Note, however, the shamrock-like plant appearing in Fig. 3. This shows a distinctly higher order of plant development than the other two, indicating formation of coal in a different era.

a fund of knowledge about "coal balls" and their value to the coal industry.

"Coal balls" are rounded limestone nodules found in the coal bed. They contain perfectly preserved fossil plants of the kind that formed coal beds of the world during the carboniferous age. These peculiar formations have been found in European coal measures since 1836 and have given to science an accurate knowledge of the plants that lived on the earth during the period when the coal beds were being laid down.

When one of these coal balls found by Dr. Noé, near Harrisburg, Ill., in 1922, was examined microscopically the discovery was made that it contained the stem of a flowering plant similar to a present-day cornstalk. This discovery appears to relegate to the discard previously conceived theories of the age of the earth, as the coal balls of Europe had revealed only club mosses, horsetails and other of the lowest forms of plant life. The discovery in a coal ball of a flowering plant, a type of life that science had believed had been developed only millions of years after the coal beds were formed, indicates that the world is a few hundred million years more or less older than it had previously been believed to be.

Whether or not Dr. Noé will find duplicates of his "King Tut of plants," as it might be called, in the explorations which he proposes to make during coming seasons in the Midwest coal fields, may be a matter of doubt. In any case such a discovery would be of interest to science if not to coal operators.

The significance of this work to the coal producer lies in the fact that the coal beds of America may now be given the same careful search for "coal balls" that has

In many instances he does not possess this information. Coal mines have been worked for years without the operators really knowing what beds they had or they gave the beds only local names without reference to the distribution of a particular coal.

"Coal balls contain materials which, when examined

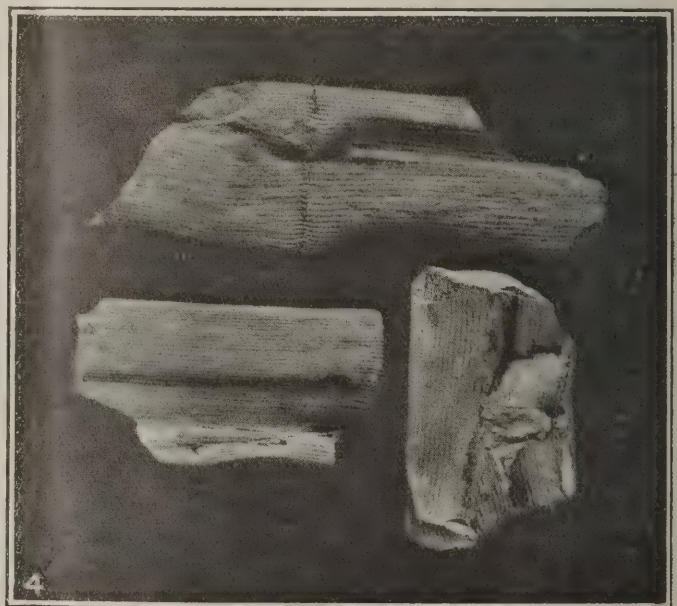


Fig. 4—What Is the Story Here?

This particular coal forming plant is of an unusual type and might indicate the formation of the coal in a time varying from that usually assigned. The jointed stem of the plant, evidently is endogenous—the species which develops from the core instead of by adding outer layers—and resembles a corn stalk.





Fig. 5—Coal Ball Split Through Its Center

Here can be seen the beautifully preserved fossil plants inside. Each coal bed has its characteristic flora. Consequently the fossil plants in a coal deposit serve as a means of identification. Coal measures thus may be recognized as unerringly by their fossils as criminals are by their finger prints.

with a microscope can be identified with great accuracy. The fossil plants that appear in a coal bed are mere impressions in the shale or sandstone but if well preserved they can be closely identified. These are the occasions when fossil plants play a practical role. It can be easily imagined that in prospecting for coal beds in regions which have not been defined or drilled, special attention must be given to those fossils which are invariably found associated with that particular coal."

The accompanying illustrations are made from photographs of fossil plants found in the No. 2 coal bed of Illinois. This particular measure is of high commercial importance because of its chemical qualities. It produces an excellent fuel for the steel industry.

### Spitzbergen, the New Coal Bin of Norway

THE hitherto little known group of Spitzbergen islands off the coast of Norway have suddenly assumed great commercial prominence due to the discovery by Dr. Adolf Hoel, of the University of Christiania, of the great extent of its coal deposits.

According to the survey just completed there are in this area over 8,000,000,000 tons of high-grade coal of which quantity 1,500,000,000 tons are of Carbonaceous formation, 1,500,000,000 tons are of Calcareous formation, the remainder of the deposit being of the Tertiary formation. Though all this coal does not belong to Norway the large quantity that does belong places her in a promising position. Considering only that part of the tonnage held by the largest operating company and entirely overlooking other Norwegian companies and the possibilities of further extensions of the known fields she possesses an average of 600 tons of coal per inhabitant.

Many Norwegian companies are operating in these fields and others are being formed for the purpose. It is understood that there will be no objection to the introduction of outside capital, provided that the companies are organized under the Norwegian laws and administered in Norway. A few years ago a group of

Hollanders negotiated for the development of certain of these areas in this manner. Last year Norwegian and other companies employed 1,192 men in working their holdings, and this year a larger number of workers will be engaged. Most of the miners are Norwegians, the government doing all in its power to make the men and their families content by establishing hospitals, schools, churches and libraries. The workmen are given six months' contracts and are housed in modern homes.

Last year this little group of islands exported 340,000 tons of coal as against 19,000 tons in 1916. Of this quantity Norwegian-owned mines were responsible for 229,596 tons and foreign-owned mines for 113,346 tons. Up to date about \$20,000,000 have been expended in the development of these mines, but the next year will probably witness a material increase in the capital invested in this work.

At present the largest operating company is Norwegian, its holdings containing approximately 1,500,000,000 tons of coal. This organization, known as Store Norske Spitzbergen Kulkompani, is both progressive and aggressive and is in the market for modern coal-mining machinery of all classes. Plans have been under way for some time to open two new mines at Green Harbor, which it is understood will have an annual output of 300,000 tons each.

### Can Run Mine Cars on Railroad Track

BY C. E. REYNOLDS

Superintendent, Allegheny-Pittsburgh Coal Co.  
Logans Ferry, Pa.

In the supply yard at the Springdale mine of the Allegheny-Pittsburgh Coal Co., Logans Ferry, Pa., heavy oak planks are laid in and around a 70-deg. crossover of mine and railroad tracks, thus forming the platform shown in the accompanying illustration. The



Platform Flush with the Rails

Any piece of heavy mine equipment may be unloaded from the railroad car, moved to this platform and transferred with ease to the mine track.

railroad track is provided with a third rail at mine-track gage, which extends from the secondary tippie to the crossover.

Mine cars, locomotives and cutting machines are lifted from open railroad cars by means of a block hung from the tippie structure. They are then lowered to the rails laid at mine gage. Next they are moved from the unloading point to the crossover platform. This is flush with the top of the rails and facilitates slueing the car during its transfer from one track to the other.





## News Of the Industry



### Coal Trade Fails to Realize Importance Of Oil Competition

Overproduction of Petroleum Presents Problem Similar to That Facing Coal Industry—Leadership in Power Output Claimed by Oil Producers Questioned, but Margin Is Close

BY PAUL WOOTON  
Washington Correspondent of *Coal Age*

To bring to all branches of the coal trade a keen realization of the proportions of oil competition is one of the crying needs of the day, in the opinion of those deeply interested in the welfare of this industry. The conditions which brought about the production of 730,000,000 barrels of petroleum in 1923 are thoroughly unsatisfactory to the oil industry. It represented a glut of overproduction on a scale never before known.

Coal mines can be shut down, but the only way oil production can be checked is through an agreement among all producers in an entire field. This cannot be done legally under the interpretation which the courts are placing on the anti-trust statutes. This overproduction of oil, which is flooding the market, bursting storage facilities and building up unprecedented stocks of surplus crude and gasoline, does not spell prosperity to the oil industry. It means ruinously low prices—prices so low that the industry is forced to displace coal in order to realize anything from its surplus. Not only is coal suffering from the same trouble as oil but coal has an additional interest in some agreement that will halt overproduction in that surplus oil must be sold in displacing an enormous amount of coal.

#### Standard Oil Co. Boasts

Those who are studying the effect of oil competition on coal are convinced that the industry itself lacks a clear realization of the extent of the inroads being made. The Standard Oil Co. just at this time is boasting in newspaper advertising that oil now is the chief source of power in the United States. The inference is that it definitely has displaced coal from the head of the list. An analysis of the situation indicates that the claim of the Standard Oil Co. is not justified but it also shows that while coal probably still is in first place the margin between it and oil is a very narrow one. By narrowing the comparison to power—excluding heat—it is necessary to include gasoline as well as fuel oil in the calculation.

The 730,000,000 barrels of petroleum produced last year is equivalent to

200,000,000 tons of coal. The 1923 output of anthracite and bituminous coal combined was 657,000,000 tons, so that at first glance the ratio of coal to oil still would seem to be three and one-half to one even on a B.t.u. basis. Out of the 657,000,000 tons of coal, however, a considerable deduction must be made since a part of it is not used in power production. In round numbers these deductions would be: Anthracite, 70,000,000 net tons; bituminous coal used as domestic fuel, 60,000,000 tons; coal for coke, 80,000,000 tons; exports and bunker, 30,000,000 tons; heating requirements of the industries, including cement and brick manufacture, metallurgical and other uses, as well as that necessary to keep factories warm, 50,000,000 tons; gas works, 6,000,000 tons. This leaves a balance used for power of not more than 360,000,000 tons.

#### Oil Has High Thermal Efficiency

This would seem to indicate that coal still had a lead of almost two to one over oil, even when power uses only are considered. However, consideration must be given to the fact that more power is squeezed out of oil than is produced from coal. While it is true that the ordinary gasoline engine falls far short of the 35 per cent thermal efficiency which it gives theoretically, in actual performance it does much better than the ordinary steam plant burning coal and makes a locomotive look sick in comparison. The gasoline engine delivers at least 15 per cent over-all thermal efficiency, whereas the locomotive, considering standby losses, has less than 5 per cent efficiency. When allowance is made for the superior efficiency of gas engines over steam engines in getting power units out of fuel units considerable of the lead of coal is overcome.

Since no accurate calculations have been made of the average efficiency of steam plants, only approximations can be used. In all probability an assumption of 7 per cent of the average thermal efficiency of the coal-burning power producing equipment is high. A corresponding assumption of 10 per cent for the petroleum-using power producing equipment (including gasoline en-

### "Back to Coal" Movement Still On

A recent report of the Young Men's Christian Association of Boston in reference to the heating of its building contains this interesting statement:

"We are glad to call attention to the fact that we are now burning coal in the heating plant at a very distinct reduction in the heating price at the present time over oil. The decision to change from oil to coal-burning was made after careful study of the situation, in which we were greatly helped by the engineering school. If the present prices prevail, we should show a saving of several thousand dollars during the year by using coal in our heating plant."

gines) probably is low. The coal industry then will be willing to accept the following equation:

$$360,000,000 \times 7\% = 25,200,000$$

$$200,000,000 \times 10\% = 20,000,000$$

Now the comparison has shrunk to proportions of 25,200,000 for coal to 20,000,000 for oil. Under the most favorable conditions this is all of the lead which coal has as a power producer. The petroleum industry, of course, will insist that steam efficiency is less than 7 per cent and would raise the 10 per cent assumed for petroleum products.

While this calculation is rough it serves to point out the extraordinary inroads which oil has made in the field of power production. The coal-burning equipment includes most of the 65,000,000 hp. represented by steam locomotives. It includes most of the 20,000,000 hp. of the central stations and most of the 30,000,000 hp. of prime movers in industry and most of the 6,000,000 hp. employed in mines. This represents some 120,000,000 hp., but the power plants of automotive vehicles alone greatly exceeds that total. There are 16,000,000 motor vehicles in the country with an average actual horsepower which is certainly not less than twenty-five. On that basis the installed capacity would be 400,000,000 hp., more than three times the figure for coal-burning equipment.

The coal industry still is strongly entrenched in the heating field, but even there the small oil burner is winning favor. Any frank appraisal of the situation leads to the conclusion that coal must join hands with oil in a determined effort to eliminate the wastes of overproduction.



## 186 Miners Lose Lives in September Mine Accidents; Nine Months' Total 1,821

Accidents at coal mines in the United States in September, 1924, resulted in the death of 186 men, according to reports furnished by State mine inspectors to the U. S. Bureau of Mines. The number of fatalities reported includes 39 deaths in an explosion at Sublet, Wyo., on Sept. 16 and 5 deaths in an explosion at Rains, Utah, on Sept. 21. As the output of coal in September was 48,624,000 tons, the fatality rate for the month was 3.83 per million tons mined, as compared with 3.97 in the previous month and 2.94 for September last year, during which month no large disasters occurred, and an average rate of 3.60 for September during the 10-year period 1914-1923. For bituminous mines alone the reports showed 157 lives lost and a fatality rate of 3.83 per million tons, as compared with a rate of 2.70 for September last year and a ten-year average rate for September of 3.30. For anthracite mines alone, the number of fatalities in September was 29 and the fatality rate was 3.82, as compared with 6.86 for September last year and a ten-year average rate for September of 5.57.

Reports covering the first nine months of 1924 show a total of 1,821 lives lost in accidents at coal mines, as compared with 1,942 in the corresponding months last year. The fatality rate for 1924 to the end of September stands at 4.51 per million tons, as compared with 3.89 for the same period last year. For bituminous mines alone the average

### Mule 20 Years "Below"

Frequent mention has been made of the faithful old mine mule which has been kept underground for a term of years, then retired to old age by the mining company. The Penwell Coal Mining Co., of Pana, Ill., has just removed a mule to the surface which has been underground for more than twenty years. He has been retired to pasture on an old-age pension. As might be expected, he was blinded when he first saw the light of day, but his sight gradually returned.

rate in 1924 for nine months was 4.34, as against 3.59 in 1923. For anthracite mines alone the 9-month average rate was 5.34 as compared with 5.68.

The two explosions in September brought the total number of "major" disasters in 1924 to 9 with a loss of 452 lives, as compared with 7 similar disasters and 254 lives lost during the first nine months of 1923. The fatality rate per million tons based exclusively on the number of lives lost in accidents killing five or more men during the first three-quarters of 1924 was 1.12 as compared with 0.51 in 1923.

Comparing the causes of the fatal accidents in 1924 to the end of September with those for the same period in 1923, the record shows that explosions of gas and coal-dust continue to be the only class of accidents with increased fatality rates.

## Italy Imports More Coal from United States and Germany

Italy's imports of coal and coke during the first six months of the current year, according to the official figures given out by the Ministry of Finance, amounted to 3,666,690 tons against 3,818,962 in the corresponding period of 1923 and 3,065,491 in 1922, says Assistant Trade Commissioner J. A. Palmer, Rome, in a report to the U. S. Department of Commerce. In addition, 1,474,246 tons was received on account of reparations from Germany, compared with 950,628 tons in 1923. These figures, although official, do not coincide with those issued by the Reparations Commission under date of July 21, which placed the quantity of coal and coke shipped to Italy during the first half of 1924 on reparation account at "about two million tons."

Imports of American coal continue to grow, averaging about 47,000 tons per month during the first six months of this year against an average of only 20,000 tons during the same period last year. Germany's shipments of non-reparation coal also shows a substantial increase over last year, being in excess of arrivals from the United States whereas in the past, they were smaller. Shipments from France continue to decline.

Imports of British coal and coke, which, as a result of the reduction in reparation deliveries, were unusually high during the first six months of 1923 (3,398,385 tons), fell back to 2,831,543 tons in 1924, or about the same level as in 1922.

## Coal-Mine Fatalities During September, 1924, by Causes and States

(Compiled by Bureau of Mines and Published by Coal Age)

State	Underground									Shaft				Surface						Total by States						
	Falls of roof (coal, rock, etc.).	Falls of face or pillar coal.	Mine cars and locomotives.	Explosions of gas or coal-dust.	Explosives.	Suffocation from mine gases.	Electricity.	Animals.	Mining machines.	Mine fires (burned, suffocated, etc.).	Other causes.	Total.	Falling down shafts or slopes.	Objects falling down shafts or slopes.	Cage, skip, or bucket.	Other causes.	Total.	Mine cars and mine locomotives.	Electricity.	Machinery.	Boiler explosions or bursting steam pipes.	Railway cars and locomotives.	Other causes.	Total.	1924	1923
Alabama	2		1		1		2					6													6	7
Alaska																									0	0
Arkansas																									0	0
Colorado	1	2										3													3	2
Illinois	8		1									9													9	19
Indiana	2											2													2	6
Iowa																									0	2
Kansas																									0	2
Kentucky	9		1		1		2					13													13	8
Maryland			1									1													1	0
Michigan																									0	0
Missouri	2	1										2													2	1
Montana																									2	8
New Mexico	2										1	2													2	0
North Dakota																									0	0
Ohio	6	1	5									12					1	1							13	13
Oklahoma																									1	2
Pennsylvania (bituminous)	5	1	7		1		1		2			17			1			1		1				1	19	32
South Dakota																									0	1
Tennessee		1									2	3													3	0
Texas																									0	0
Utah	1		2	5								8													8	2
Virginia	2						1					3													3	1
Washington																									0	1
West Virginia	13		8				3	1			2	27						1							28	28
Wyoming		1	2	39								42													42	0
Total (bituminous)	54	6	29	44	3		9	1	2		5	153			1	1	2		2					2	157	129
Pennsylvania (anthracite)	11	2		*3	1	1	2				3	27						1					1	2	29	20
Total, Sept., 1924	65	8	33	47	4	1	11	1	2		8	180			1	1	2	1	2					4	186	
Total, Sept., 1923	84	4	24	6	5		9	2	2		8	138	2		1		3	1	1				5	8		149

\*Gas explosions only.



## Industrial Board Probes Trade-Association Work

The policy of the government toward co-operation and combination in private business enterprise, as expressed in the anti-trust laws, judicial practice, and the activities of the Federal Trade Commission, present difficulties and unsolved problems of the greatest public importance, says the National Industrial Conference Board in a statement just issued.

A lack of a clear and definite expression of public policy toward certain forms of business activity which have grown up out of changing economic conditions jeopardizes business and industrial development, the board says, and raises questions of vast importance to the public and the business community.

In this connection it was made known that the National Industrial Conference Board has been engaged for over a year in an intensive study of the development and present status of public policy toward private business enterprise, with special reference to the application of the anti-trust laws. This study, it was announced, covers the legal and economic aspects of the development and regulation of industrial combinations and the control of various forms of business co-operation and trade practices, the financial and economic aspects of business combinations, the relation of anti-trust laws to labor and the bearing of industrial combinations upon foreign trade and international affairs.

The purpose of the whole investigation, states the board, is to clarify for the public and the business community the present situation with respect to governmental policy so as to provide a sounder and more scientific basis for discussion of the vital issues which have arisen out of that situation. The investigation is being carried out by the research staff of the board in co-operation with a group of legal and economic authorities of national eminence in this field, and a large body of industrial and business leaders.

## Coal Stock Excites Utah

In Utah vigilance committees of the Cache County Farm Bureau and the Logan City Chamber of Commerce are waging a vigorous war on coal stock salesmen. It is asserted there are salesmen for four different coal companies in the county selling stock that is not a desirable investment. A widow is said to have been persuaded to part with \$2,000 of insurance money for some of it.

Those behind the anti-coal-stock-salesman movement are telling the people that too much coal is being produced already and that buying stock keeps more useless mines open, reducing working time and thus is responsible for keeping up the price. "Can't you see the handwriting on the wall?" says one message. "Let the big coal operators who have their money invested and are prepared to supply the coal put up the money. Don't sink your hard earned money in a coal or other mining scheme. It will never pay." It is understood that the attack is on the several mutual companies that are springing up.

The board's announcement says that since the whole issue of public policy has been raised recently in connection with the effort of the Secretary of Commerce and the Attorney General to define what trade associations may or may not do, the first report resulting from the board's investigations is a comprehensive survey and analysis of "Trade Associations and Their Activities." This report, to be issued soon, analyzes the development of trade associations and the legal status and economic importance of their activities, and will focus national attention on the place of trade associations in our industrial economic structure.

## Pennsylvania Abandons Plan To Lease N. & W.

After negotiations extending over nearly the last year, announcement was made Oct. 28 by the Norfolk & Western Ry. and the Pennsylvania R.R. that plans for a long-term lease of the Norfolk & Western property by the Pennsylvania had been abandoned because a financial basis could not be agreed upon.

The statement, issued by A. C. Needles, president of the Norfolk & Western, said: "The Pennsylvania Railroad Co. has been unable to make a proposition for a long term lease of the Norfolk & Western property on a financial basis which in the opinion of the Norfolk & Western directors would be satisfactory to its stockholders, and all negotiations for such lease have therefore been concluded. The conclusion of these negotiations will not affect the friendly relations existing for a long time between the two companies and which have been to their mutual benefit and to the advantage of the territories served by both."

## Lewis Sure of Re-election

The re-election of John L. Lewis as international president of the United Mine Workers is being forecast in Indianapolis. Nominations for international officers have been closed, and while ballots have not been prepared officially and it is not known exactly who, if anyone, will oppose Mr. Lewis for the presidency, it was said at international headquarters that Mr. Lewis seems to have almost a clear field. Likewise there is no formidable opposition to the re-election of Philip Murray as international vice-president, and William Green as international secretary-treasurer. In former years Mr. Lewis has met with formidable opposition when radicals led by Alex Howat, then president of the Kansas district, and Frank Farrington, president of the Illinois district, sought to capture control of the international organization.

## Output and Value of Coal from Kansas, Maryland and Michigan Mines in 1923

(Compiled by U. S. Geological Survey)

State and County	Loaded at Mines for Shipment (Net Tons)	Sold to Trade and Used by Employees (Net Tons)	Used at Mines for Steam and Heat (Net Tons)	Made Into Coke at Mines (Net Tons)	Total Quantity (Net Tons)	Total Value	Average Value per Ton	Number of Employees				Average Number of Days Worked
								Underground Miners, a	All Others	Surface	Total	
<b>Kansas:</b>												
Cherokee.....	611,296	6,522	17,479	.....	635,297	\$1,884,000	\$2.97	382	99	249	730	162
Crawford.....	2,974,563	61,527	63,918	.....	3,100,008	9,987,000	3.22	4,429	991	659	6,079	142
Leavenworth and Osage.....	101,503	48,903	668	.....	151,074	616,000	4.08	630	155	64	849	192
Linn.....	30,854	2,800	210	.....	33,864	119,000	3.50	93	24	10	127	98
Total, excluding wagon mines	3,718,216	119,752	82,275	.....	3,920,243	12,606,000	3.22	5,534	1,269	982	7,785	149
Wagon mines served by rail..	115,161	.....	.....	.....	115,161	375,000	3.26	.....	.....	.....	.....	...
Grand total.....	3,833,377	119,752	82,275	.....	4,035,404	12,981,000	3.22	.....	.....	.....	.....	...
<b>Maryland</b>												
Allegany.....	1,433,420	62,512	11,733	.....	1,507,665	4,852,000	3.21	1,563	551	366	2,480	198
Garrett.....	725,619	15,311	14,682	.....	755,612	1,976,000	2.62	797	263	185	1,845	137
Total, excluding wagon mines	2,159,039	77,823	26,415	.....	2,263,277	6,828,000	3.02	2,360	814	551	3,725	178
Wagon mines served by rail..	22,649	.....	.....	.....	22,649	83,000	3.66	.....	.....	.....	.....	...
Grand total.....	2,181,688	77,823	26,415	.....	22,85,926	6,911,000	3.02	.....	.....	.....	.....	...
<b>Michigan</b>												
Bay.....	384,669	3,992	15,342	.....	404,003	1,927,000	4.77	485	246	79	810	231
Calhoun and Shiawassee....	23,250	2,500	.....	.....	25,750	92,500	3.59	8	34	4	46	97
Saginaw.....	678,129	9,743	54,300	.....	742,172	3,525,000	4.75	720	300	101	1,121	220
Total, excluding wagon mines	1,086,048	16,235	69,642	.....	1,171,925	5,544,500	4.73	1,213	580	184	1,977	222
Wagon mines served by rail..	150	.....	.....	.....	150	500	3.33	.....	.....	.....	.....	...
Grand total.....	1,086,198	16,235	69,642	.....	1,172,075	5,545,000	4.73	.....	.....	.....	.....	...

a Includes also loaders and shotfirers.



## Campaign for Clean Coal Meeting with Success, Ohio Engineers Report

The report of the committee on the evaluation of coal, appointed at the January meeting, was the main subject at the sixth annual meeting of the Southern Ohio Pig Iron & Coke Association, held at Columbus, Oct. 17 and 18, jointly with the Ohio Section of the American Institute of Mining & Metallurgical Engineers. W. W. Stevenson, Semet-Solvay Co., Detroit, chairman of the coal evaluation committee, reviewed the committee's work, stating that the evaluation of coal was such a large subject that the committee felt that for the present at least it would be well for it to consider only the evaluation of coal for blast-furnace use.

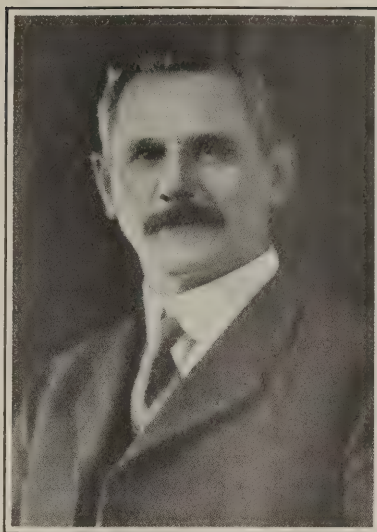
The committee took the analysis of coke agreed upon by the Southern Ohio Pig Iron & Coke Association as a basis for discussion, and a recommendation was made that the base coal to be used for byproduct coking purposes should have approximately 6.5 per cent of ash on a dry basis and a volatile matter content such that 1.45 tons of coal would be required for one ton of coke. The tentative recommendation also was made that moisture should not be over 3 per cent, and sulphur no greater than 0.75 per cent, with a penalty for sulphur above 1 per cent. The recommendations of the committee were made after full discussion, aided by charts showing experiments conducted by L. R. Forest, Semet-Solvay Co., Syracuse, which showed the advance in the cost of producing pig iron from high-ash coal.

### Try to Evolve Base Coal Analysis

Following discussion of the committee report it was recommended that the committee continue its deliberations, taking in also the evaluation of coal for gas-producer and steam use and endeavor to arrive at a base coal analysis similar to that used in the iron-ore trade, and above which a premium would be paid for coal, with a penalty for coal below the base grade.

The clean-coal campaign inaugurated by the association two years ago, President Sweetser said in his address, was having wonderful success. He declared that since the matter had been brought to their attention the coal operators were determined to set their house in order without interference from outside sources, and cited the change in advertising methods of many companies, in which clean coal was stressed. Whereas two years ago it was almost impossible to get clean coal, today coal can be bought on a guaranteed basis. The campaign was an educational one, and it is getting down to the miners themselves, as in a recent agreement signed in an Ohio district the miners agreed to take every means in their power to mine clean coal.

The question of sampling coal was taken up in a report by C. B. Murray, secretary of the Ohio Section of the American Institute of Mining & Metallurgical Engineers, in which he cited a number of methods of sampling, and recommended that the proper place for sampling was at the mines. Coal anal-



**John H. Jones**

President of the Bertha-Consumers Co. and well known as a pioneer in the creation of the modern mining town.

ysis was discussed by Prof. D. J. Demorest, Ohio State University, who said that the only inspection necessary in cases where output of certain mines is purchased is for ash and sulphur. When buying from the jobber, all tests must be made, and in the case of coal for gas-producer use a check of the B.t.u.'s also was necessary.

A discussion of the methods of sampling and inspection followed a report by G. W. Coughlin, American Rolling Mill Co., Ashland, Ky., in which he described the value of the visual inspection carried on by his company at its mines. The main reason for this inspection is to check up the mines. The company has set up a quality standard for each section of mines. A complete visual inspection checked by a 20 per cent analysis made a complete but not costly standard. Referring to the value of the inspection department, Mr. Coughlin said that for a six months' period the ash content of coal mined in the various sections where inspectors were employed had dropped approximately 50 per cent.

Discussion of the report revolved about the establishment of control laboratories at coal mines, from which a quick report could be obtained as to the analysis of coal being mined. It was felt that if it were possible to have control laboratories established, it would be a very profitable investment for the producer. Prof. H. E. Nold, of the Mining Department of Ohio State University, stated that with such a laboratory the producer would be in a position to know just what kind of a contract to accept, thus eliminating the danger of having coal rejected on reaching destination.

Further discussion on the question of rating of mines, grading of mines, grading of coal, education of miners, producers and consumers, and of waste took place before the meeting adjourned, but no action was taken on any definite recommendation, it being felt that the association should make only tentative recommendations until the question of evaluating coal be more thoroughly discussed.

## Efforts to Merge More Mines Continue in Kentucky

Large expansive talk about a ten million dollar merger of western Kentucky mines floods the region these days, due mainly to the activities of a scattered group of financial men such as L. H. McHenry, a surety bond holder agent of Louisville, Ky.; P. B. VerPlanck, George E. Hutchinson, Joseph A. Howorker and R. S. Morriss, of Chicago; R. J. Jones, of Columbus, Ohio, and Edward C. Larkin, of Dayton, Ohio. But up to date no merger has progressed beyond the stage of engineering appraisals and a general feeling out of the situation by banking groups.

Seven mines are under option that is reported to expire Nov. 4. The seven are all in the Muhlenberg field, near Central City, Ky., and are all strike bound at the present time. It is reported that the deal involves two mines of the W. G. Duncan Coal Co., at Graham and Luzerne; the mine of the Wickliffe Coal Co. at Browder; two mines of the Greenville Coal Co., at Powderly and Martlewick; a mine of the Pacific Coal Co. at Mercer and a mine of the Nelson Creek Coal Co. at Nelson Creek.

Most of these properties have long been known to be for sale because of the troublous conditions in Muhlenberg County, but nobody has been able to offer enough to buy them and those who have the money to buy at a reasonable price have been afraid of the whole thing because of the strike which has kept the whole of the county tied up since last spring. However, there is a chance of the union strength of the county dissolving soon. Already a half dozen small mines in the county are working on an open-shop basis at the 1917 scale and it looks as if the rest of the county might slip out of the union strangle hold within a few weeks. This may open the way for a mine merger.

## Western Canadians Work Despite Close Vote

With reference to the recent settlement of the coal strike in District 18, United Mine Workers, it is interesting to note that there were majorities against a settlement in most of the coal mining centers of the Province of Alberta. British Columbia, however, was so overwhelmingly in favor of accepting the recommendations of the miners' representatives that the scale was decisively turned in favor of returning to work. The vote by districts is given unofficially as follows with "yea" vote given first: Drumheller, 527 to 1,105; Lethbridge, 220 to 235; Fernie, B. C., 495 to 63; Michel, B. C., 195 to 115; Coleman, 425 to 113; Edmonton, 1 to 39.

During the past week, however, reports indicate that the atmosphere is clear in all the coal fields both of eastern British Columbia and Alberta. The miners have accepted the verdict of the majority, taken up their tools, and returned to work on the terms of the agreement recommended to them. Production both in British Columbia and in Alberta from this date may be expected to reach substantial tonnages.



## Midwestern Engineers Visit Coal Mines of South Illinois Field

The annual autumn meeting of the St. Louis section of the American Institute of Mining and Metallurgical Engineers terminated at Duquoin, Ill., Sunday afternoon Oct. 19 after two days spent inspecting coal properties of southern Illinois. More than 100 men, many of them prominent in the mining of Illinois, Missouri, Oklahoma, Kansas, Indiana, Kentucky and Tennessee, attended. The local committee, under the chairmanship of Dr. L. E. Young, of St. Louis, general manager of the Union Colliery Co., arranged the program.

The visitors assembled at 8 a.m. Saturday at the St. Louis end of the Free Bridge, where cars awaited them. Their route was over the state hard road to Duquoin, a short stop being made at the new strip mine of the Gayle Coal Co., just north of Duquoin. This pit is one of the largest in Illinois. At Duquoin the party had luncheon at the St. Nicholas Hotel and spent the afternoon inspecting the large Kathleen mine at Dowell, owned by the Union Colliery Co., and the new strip mine of the Black Servant Coal Co., at Elkhaville. Returning, the visitors enjoyed an informal dinner at the St. Nicholas Hotel.

At 8 p.m. Saturday the men assembled in the dining room of the hotel, where for two hours they listened to a number of informal talks. J. D. Robertson, of St. Louis, well known mining engineer, presided over the meeting, and Walter E. McCourt of the Washington University of St. Louis, served as secretary.

### Tells Early Mining History

The first speaker was Arthur Hatcher, of St. Louis, who spoke at length on the geology of the mining district. James Forester, of Duquoin, superintendent of the Paradise Coal Co., told of the early mining history of southern Illinois. He was connected with the Halliday mining interests when they operated the old Hallidayboro mine, then one of the largest in the state. Prof. H. E. Culver, of Urbana, Ill., assistant state geologist for Illinois, in an interesting address dwelt upon the geology of the Duquoin anticline.

Charles F. Spencer of Pittsburg, Kan., spoke briefly of the mining conditions in that state. He is one of the pioneers in the strip mining industry in Kansas. "Doc" Shelton, of Marion, Ohio, a representative of the Marion Steam Shovel Co., enlightened the engineers on the mechanical principles of steam shovels now in general use in strip mines. Fred L. Shimer, division manager for the Central Illinois Public Service Co., spoke at length on the power situation of the southern Illinois coal fields. His company supplies seventy-two coal mines in the district with power and is now building a power plant at Grand Tower, Ill., on the Mississippi River.

Eugene McAuliffe, president of the Union Pacific Coal Co., with headquarters in Omaha, Neb., and former

## Will West Kentucky Ruin Unionism?

With the strike in Muhlenberg County, western Kentucky, crumbling, now that six mines there are operating open shop on the 1917 scale, another solemn warning, following that of the resigning district president, Lonnie Jackson, has been uttered by County Attorney W. O. Smith, former district president of the miners. Smith says in a public statement that if the union does not make a deal with the operators of the district at a reduced wage, non-unionism is going to spread to a point where all the coal the country needs can be produced by non-union mines and that therefore the United Mine Workers will crumble. The organization, by refusing to modify the Jacksonville agreement, is cutting its own throat, he says. Wise observers of the region predict that the whole of western Kentucky will be operating either non-union or open shop before Christmas.

president of the Union Colliery Co., talked about mining conditions in the West, particularly in the State of Wyoming, where most of his company's property is located. John Garcia, of Chicago, a member of the firm of Allen & Garcia, gave an interesting résumé of present mining conditions. J. E. Jones, of the Old Ben Coal Corporation, told the assembled guests how his company has successfully employed rock dust in combating explosions.

Sunday morning the party left in automobiles for a 75-mile trip through the principal coal mining towns of Franklin and Williamson counties, including an inspection trip underground in the new monster Orient No. 2 mine of the Chicago, Wilmington & Franklin Coal Co., near West Frankfort. The men returned to Duquoin at 2 p.m., when the party dispersed.

Figures on the amount of coal consumed by certain industries now being made public by the Bureau of the Census as the returns from the 1923 census of manufacturers are becoming available show the following: Malleable iron castings, 891,981 tons; mucilage, paste and other adhesives, 11,187 tons; bookbinding and blank book making, 22,428 tons; artificial flowers, 3,221 tons; jewelry and instrument cases, 4,398 tons; soda water apparatus, 17,368 tons; window shades and fixtures, 58,450 tons; billiard and pool tables, bowling alleys and accessories, 14,407 tons; sand and emery paper and cloth, 31,110 tons; dressed furs, 60,895 tons; chewing gum, 16,215 tons; leather gloves and mittens, 13,030 tons; lead pencils, 108,078 tons; artists' materials, 16,022 tons; wool scouring, 39,905 tons; silversmithing and silverware, 15,048 tons; malt, 88,969 tons; matches, 65,019 tons; cigars and cigarette holders and pipes, 4,376 tons; trunks, suitcases and bags, 21,431 tons; foundry supplies, 64,771 tons.

## Sproul Consolidation Of Hard-Coal Companies Practically Completed

Scranton, Pa., Oct. 31.—Following closely on the heels of the announcement by Frank W. Childs, New York financier, that a \$20,000,000 consolidation of anthracite properties was nearing completion, comes the authoritative statement the negotiations are being closed for another consolidation of a number of independent anthracite companies. William C. Sproul, former Governor of Pennsylvania, is interested in the latest merger.

The consolidation now announced centers around the Von Storch Collieries Co. and the Legitts Creek Anthracite Co., with four smaller companies also involved. Warren T. Acker, owner of the Von Storch company, admitted to interviewers that the deal would be closed within a few days, but declined to furnish other details.

For the last several months there has been talk of consolidating a number of local independent companies. Late in August former Governor Sproul visited the city, but denied his trip had anything to do with a proposed consolidation.

It was reported that Mr. Acker will be the president and general manager of the new company, although this could not be verified. Mr. Acker has had much experience in the coal business and is highly regarded among men actively associated with the industry.

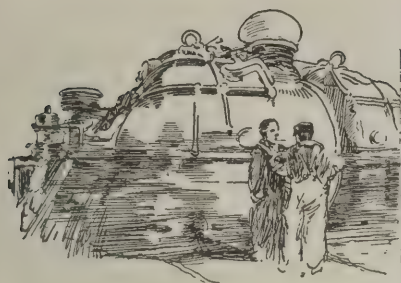
The latest consolidation has no bearing on the one which Mr. Childs announced several days ago. Included in this proposed merger are the Kingston Coal Co. and the Jermyn Coal Co., together with several other smaller companies. Originally the consolidation being engineered by Mr. Childs included the Von Storch and Legitts Creek properties. The last named concern is owned by New York and Cleveland interests.

## Heavier Coal Traffic Likely On Ohio River Soon

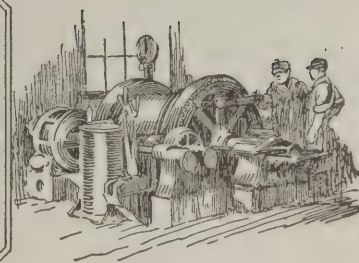
Extensive plans are being made by coal producers to use the Ohio River for water-rail shipments. One large coal producing company already has made extensive use of the Ohio by sending its coal to Cincinnati by water and there transferring the cargoes to rail carriers. A material saving is made in the transportation charge. By the end of the year the task of providing locks and dams between Pittsburgh and Cincinnati will have been completed. This will provide a 9-ft. channel at ordinary low water. This is expected to stimulate greatly the water-rail coal business, as well as the shipment in that manner of steel and other commodities.

General Edgar Jadwin, Assistant Chief of Engineers, who just has returned from an inspection of the work on the Ohio below Louisville, reports that flood progress is being made in that sector, although there still is four years of work to be done before that portion of the project will be complete. The last of the plant that will be needed for the work is being assembled at Louisville.





## Practical Pointers For Electrical And Mechanical Men



### Motorman Cannot Operate Locomotive Unless Stationed Inside Cab\*

Device Eliminates Possibility That Operator May Start Motor and  
Let It Run Wild—Three Accidents of This Kind  
Had by One Company

By J. L. BOARDMAN  
Safety Engineer, Anaconda Copper Mining Co.  
Butte, Mont.

A MOTORMAN at one of the mines of the Anaconda Copper Mining Co., alighted from his locomotive and wishing to take up some slack in his trip proceeded to operate the controller from the ground. The locomotive got away from him, and in endeavoring to get aboard he was knocked down between cars and timbers, the trip running over and seriously injuring him. The locomotive continued to the "turn sheet" on which cars are switched at the shaft. There it became derailed. A shift foreman finding the locomotive

kind happened and the electrical engineers were asked to devise some method that would make such accidents impossible.

The device consists of a movable motorman's seat connected by a system of levers to the tripping mechanism of a standard overload circuit breaker mounted under the seat. The seat is connected also by a chain to a foot lever mounted on the floor. When the motorman's weight is on either the seat, or the foot lever, it allows the standard circuit breaker to be closed,

which is placed in the "pit" of the locomotive.

The seat A is hinged at the back and elevated in the front by the springs F. When pressure is applied to the seat it compresses the springs F and forces down the plunger K. This plunger operates the pin E through the lever D and

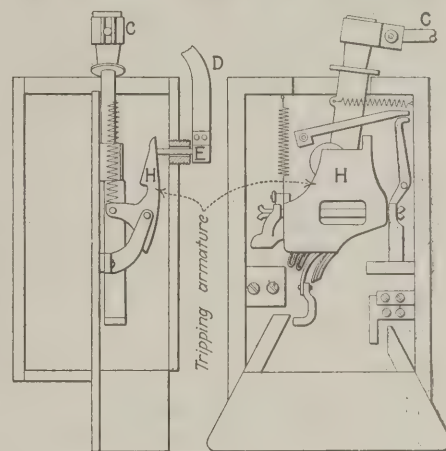


FIG. 2

#### Circuit Breaker Is Not Locked In

The pin E is forced against the tripping armature H and the circuit opened when the motorman steps out of the locomotive and releases the pressure on the seat or foot lever. The device does not prevent the circuit breaker from functioning when an overload is placed upon the locomotive.

releases the pressure on the overload circuit-breaker tripping device H allowing the circuit breaker to be closed by the reset lever C. Pressure on the seat can be provided by the motorman sitting upon it or by his pressing the treadle with the foot when standing.

If the motorman should leave the locomotive cab, thereby releasing the pressure on the seat, the pin E is forced in by the spring L and strikes against the tripping device H on a standard circuit breaker; this opens the circuit to the locomotive motors. The device does not prevent the standard overload circuit breakers from functioning on overload.

The movable seat can be adopted to electric operation of the circuit breaker by removing the levers connecting the seat to the breaker and installing an auxiliary contact or switch under the seat. This contact would control the opening or closing of the main circuit breaker and would have this advantage over mechanical operation that the breaker could be placed anywhere in the cab. The device was developed by J. M. Fine, superintendent of the electrical department and T. J. Little, foreman of the electrical shop of the company at Butte, Mont.

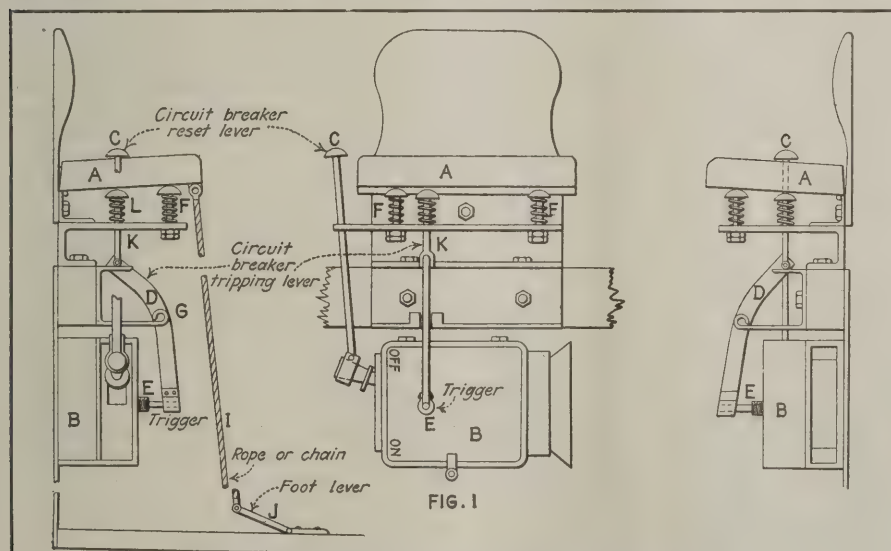


FIG. 1

#### Motorman Must Be on Seat or Have Foot on Lever

No, the motorman does not sit on the circuit breaker and hold it closed against an overload. When he sits on the seat or holds his foot on the lever the trigger is reset and the breaker can be closed. Just as soon as the motorman releases the trigger by getting off his seat and at the same time freeing the foot lever, the circuit breaker opens and power cannot be applied to the motors. This little safety feature was put on a locomotive so that the motors cannot be operated unless the motorman is in his cab and in proper position.

went back to the point where the trips were normally loaded and found the man lying by the cars.

Soon after this accident another of a similar nature occurred. Publicity was given to both mishaps, but a few days later a third accident of a like

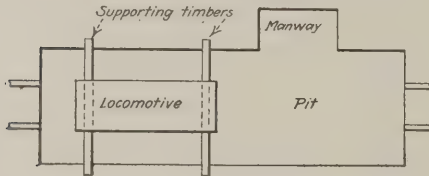
but if this weight is removed the circuit breaker is automatically opened and cannot be closed until the seat or foot lever is again depressed. This cannot be done until the motorman is in the cab of the locomotive. Thus power cannot be applied to the motor if the motorman is not on the seat or does not have his foot on the treadle

\*Contribution to Mining Section, National Safety Council, Sept. 30.



## A Cost-Saving Method of Changing Wheels

The arrangement of a well-equipped locomotive barn is one of the main factors that keeps the repair bills to a minimum and is worthy of consideration. In most cases it has been my experience that when a locomotive is to be repaired, the necessary time that should be allowed is not available and



### Where Quick Changes Are Made

This pit is large enough to accommodate three sets of wheels and still leave ample room for the workmen. It is arranged so that the rails are taken from under the wheels. It is not necessary to raise the locomotive more than a few inches because the old set of wheels is dropped from the bottom and the new set raised from the floor of the pit.

consequently the job is rushed through in great haste and no accurate work has been performed, however, the motor has been put back in service. This is indeed a bad practice and can be largely avoided by the proper arrangement of the repair shop.

Take, for instance, the retrucking of

a locomotive. This can be done in a reasonably short space of time if the pit in the locomotive barn is properly designed. I have in mind a pit that I believe is worth mentioning. It will save time and money enough on a few jobs to pay for itself. This pit is so designed that a set of new trucks may be placed in it. The locomotive is then run over the pit and raised only enough to make up the difference in the size of the old wheels and the new ones. Then the locomotive is blocked up at each end of the frame with timbers long enough to reach across the pit. The rails are then removed from under the locomotive. A chain block is fastened to the center of the axle or preferably at each end close to the wheels and the weight taken on the chain blocks. All bolts and cap screws are loosened after the motor frame has been made secure. The set of wheels is then lowered into the pit where a new one is ready to be raised and bolted properly to the frame and motor. After this operation has been repeated for the other axle the rails are placed under the wheels. When the blocking has been removed from under the frame the locomotive is ready for oiling and going to work.

This kind of a pit may be slightly expensive to build but this is not to be compared with the savings which may be made in a few months. The entrance to the pit is at one side near the end.

J. H. BLAIR.

Moundsville, W. Va.

## Systematic Handling of Motor Parts Reduces Costs

System is a byword in the mechanical and electrical departments of the Island Creek Coal Co. of Holden, W. Va. It is applied in practice to every step incident to the handling and repairing of equipment, both at the mines and in the central repair shops. Needless delays are avoided and greater efficiency is procured from the repair men by adhering to approved methods.

When an armature, for instance, is removed for repairs from either a cutting machine or a locomotive, the repair men at the mines are instructed not to take time to remove the spur gear or the bearing housings from the shaft. A spare armature is provided with these parts in position to replace the defective one. Consequently, little time is spent in replacing an armature as all adjustments are made in the central shops and not at the mine.

Fig. 1 shows a number of armatures in various stages of dismantlement in

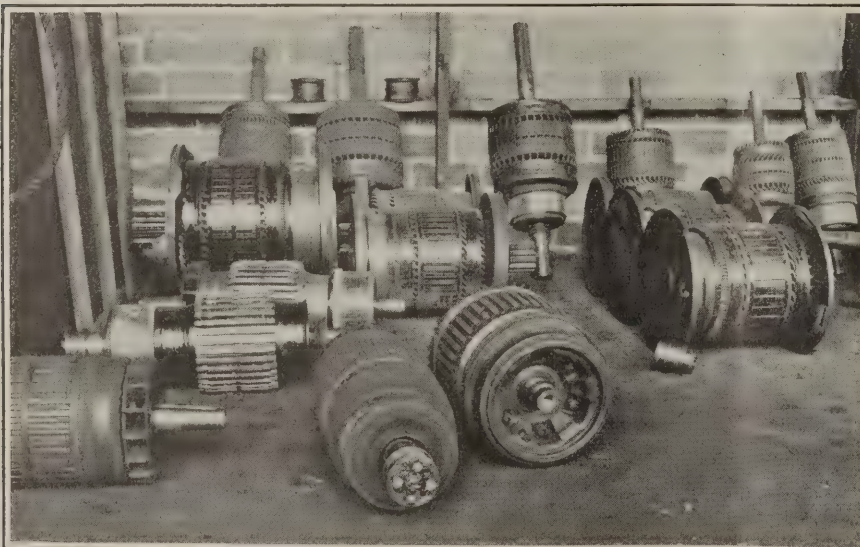


Fig. 1—Armatures in Various Stages of Repair

Repair men at the mines of the Island Creek Coal Co. do not remove the gears and bearing housings from an armature shaft when replacing armatures—there is plenty of time for that in the central repair shop where this picture was taken.



Fig. 2—Boxes for Armatures

These boxes are strongly built to protect the armatures they are intended to carry from injury caused by falls or jolts. Frequently rough handling may cause serious damage unless an armature is carefully crated.

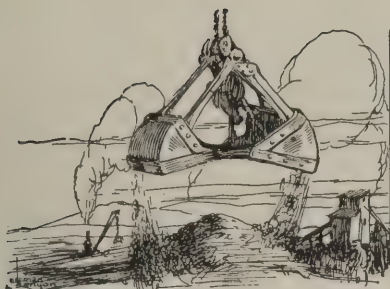
the winding room of the central shops. When the tires or a gear on a locomotive axle is in need of repair the unit—wheels, axle and gear—is sent to the central shops, a spare unit having been made available in advance to replace the one removed.

L. D. Thompson, who has charge of this company's direct-current equipment, remarks, "The shop men are not rushed for time while overhauling and adjusting equipment parts. They can do their work with the care that ample time alone insures. On the other hand the mine repair men are pressed for time and the mine is temporarily crippled should the breakdown occur during the day shift. Therefore every feasible measure should be taken to shorten delays to equipment."

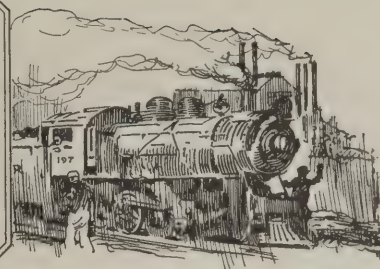
In order to guard against injury while motor parts are being handled to and from the shops and mines, the armatures are carried in strongly constructed boxes. The type of box for carrying a cutting-machine armature is shown in Fig. 2. It is built of wood and reinforced by two iron straps which are bent around the bottom and sides. The ends of these straps project above the sides of the box and through slots in a sheet iron cover. A hole is drilled in the ends of each strap for the reception of a cotter pin which holds the cover in place. Handles project from each end of the box to facilitate transportation. A somewhat similar box is provided for carrying locomotive armatures. These boxes have been known to roll and tumble down a hillside after being carelessly loaded on an incline car, without causing damage to the armature.

Each mine is provided with a spare armature for every type of machine and the central shops carry a few extras, not including those being repaired. When a defective armature is received at the central shops it is marked with a brass tag bearing the mine number for identification purposes.





# Production And the Market



## Continuance of Extremely Mild Weather Causes Coal Market to Mark Time

Continued mild weather is playing hob with the efforts of the coal industry to get under headway, the trade still being in the throes of the reaction that set in two weeks ago after a gradual but promising revival that lasted seven weeks. The usual pre-election hesitancy also has been a complicating symptom in the disorder that has the business temporarily in its grasp, buying for the time being having settled down in most instances to a strictly hand-to-mouth basis. The prolonged spell of unseasonably warm weather has not been entirely without consolation for the coal producer, however, for the drought in some sections has caused such a scarcity of water that hydro-electric power plants have been forced to use coal to keep going.

### Confident Undertone Prevails

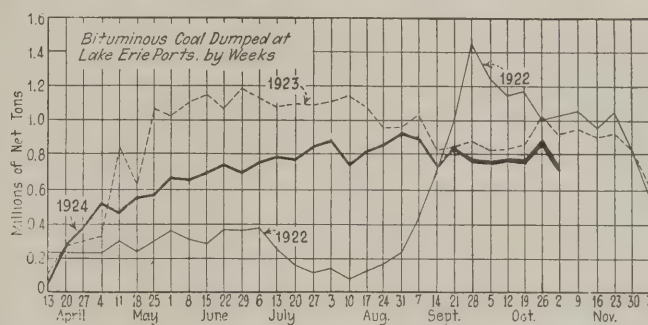
With the election out of the way and general industry in the attitude of "business as usual," activity from now on promises to be a weather proposition pure and simple, the coal trade in the meantime hankering for the welcome whistle of wintry winds. A confident tone pervades general business conditions, reflected by record-breaking movement of freight on the railroads, increasing iron and steel orders, progress in the textile industry and improvement in the automobile trade.

**Coal Age** Index of spot prices of bituminous coal, after a long gradual upward climb, flopped badly last week, standing on Nov. 3 at 171, the corresponding price for which is \$2.07, a drop of 5c. from Oct. 27.

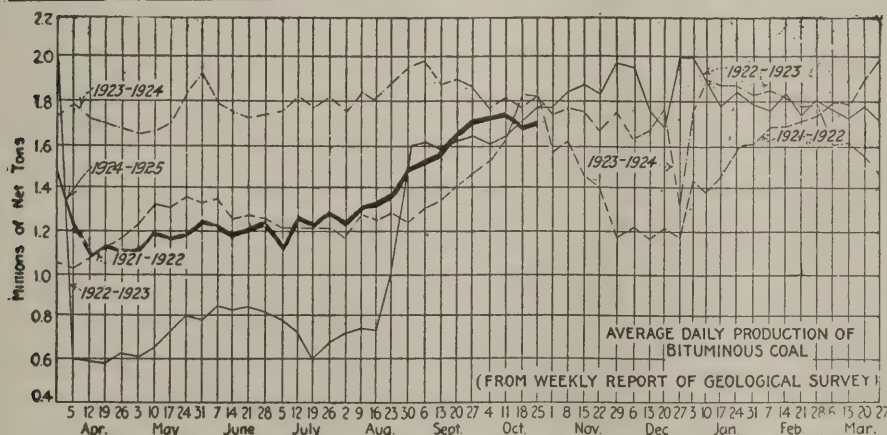
Activity at Hampton Roads underwent a slight reaction last week, dumpings of coal for all accounts during the seven-day period ended Oct. 30 totaling 363,818 net tons, compared with 384,268 tons the week before.

Coal movement up the lakes is in the wane, dumpings at Lake Erie ports during the week ended Nov. 2, according to the Ore & Coal Exchange, being as follows: For cargo, 688,548 net tons; for fuel, 38,272 tons, compared with 819,869 and 39,998 tons the previous week.

Bituminous coal output took a turn for the better during the week ended Oct. 25, when, according to the Geological Survey, 10,298,000 net tons was produced. This was a gain of 37,000 tons over the preceding week, according to revised figures, but was 255,000 tons less than the total for the week ended Oct. 11. Anthracite production, after three weeks of curtailment due to floods and other setbacks at the mines, came close to the capacity of the mines during the week ended Oct. 25, when 1,927,000 net tons was produced.



The anthracite market has suffered considerable of a setback from the weather after business had reached promising proportions, but the shrinkage in demand has been offset to a considerable extent by a falling off in production during the past week, brought about by the observance of Mitchell Day and a church holiday as well as by another local strike which kept about 10,000 miners idle for several days. Egg is moving more easily, some consumers taking it when unable to obtain stove, which leads in demand, as usual. Chestnut is holding up fairly well, but pea is rather slow. Trade in steam sizes is only fair. Independent prices are still firm, due to curtailed output rather than the volume of demand. The effects of the flood at the mines a few weeks ago are no longer much of a factor as far as production is concerned.



### Estimates of Production

(Net Tons)

#### BITUMINOUS

	1923	1924
Oct. 11.....	10,953,000	10,553,000
Oct. 18 (a).....	10,694,000	10,261,000
Oct. 25 (b).....	10,919,000	10,298,000
Daily average.....	1,820,000	1,716,000
Cal. yr. to date (c)...	454,278,000	373,459,000
Daily av. to date.....	1,799,000	1,475,000

#### ANTHRACITE

Oct. 11.....	1,943,000	1,737,000
Oct. 18.....	1,978,000	1,750,000
Oct. 25.....	2,001,000	1,927,000
Cal. yr. to date.....	77,493,000	74,690,000

#### COKE

Oct. 18 (a).....	286,000	147,000
Oct. 25 (b).....	276,000	140,000
Cal. yr. to date (c)...	15,608,000	8,011,000

(a) Revised since last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.



### Midwest Prays for Cold

Summer weather during late October may be hard on football teams but it is harder on coal men. The Midwest coal trade is gasping for breath, wiping the sweat out of its eyes and yearning for the whistle—of north winds. Domestic business is distinctly hard to handle, for householders are not buying heavily and mine tracks are filling with prepared sizes. There are no marked changes in circulars from such strong fields as southern Illinois, but western Kentucky is beginning to unload domestic sizes at 10 and 15c. off.

Of course small coal and steam sizes are in trouble. However, production in some of the Illinois and Indiana fields has been reduced, storage on the ground continues, and as a result not much drop in steam prices is noticeable except in the "off grade" fields. Everybody knows that cold weather is bound to come before long and the thing to do is hold on to slow sizes until then. Some mighty cheap coal has been traded from day to day on the Chicago market, where buyers are keen for all the advantages there are. Any good southern Illinois screenings that reach there without a buyer cannot hope to bring more than \$1.25. In the country, however, \$1.40 and \$1.50 are prevailing prices.

Eastern coal is not reaching the Midwest in any great volume because of this soft condition, but that which does

is selling a little under circular. Pocahontas, always popular in recent years around Chicago, has weakened a little.

The situation in the Carterville field continues fair for lump. Most mines are pretty well oversold. They are caught up on egg and are long on No. 1 nut, and the other sizes below that are a drag on the market. Mountains of screenings are stored on the ground near many of the mines in southern Illinois and it is only a question of a short time now until all storage capacity will be filled.

Railroad tonnage is fairly good and a considerable portion of this is coming from strip mines which seem to be working full time on account of the unusually pleasant weather and the fact that they can sell their coal in competition with western Kentucky non-union and also most anything else that they may have to compete with. In the Mt. Olive district warm weather has slumped off the domestic demand although there is still some moving and the steam sizes are pretty well taken care of on contract. In the Standard district it is still a day to day proposition with coal selling at cost or below. A car shortage has been developing recently. This was noticeable first on the L. & N. and is beginning to show up on points of the Pennsylvania, B. & O. and Illinois Central.

At St. Louis warm weather has eased up the domestic movement of coal. The trade is principally in the better grades. The movement of Standard and Mt. Olive will not reach its maximum until real cold weather sets in. Wagon-

### Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern		Market Quoted	Nov. 5 1923	Oct. 20 1924	Oct. 27 1924	Nov. 3 1924†
Smokeless lump.....	Columbus...		\$5.85	\$4.50	\$4.50	\$4.25@ \$4.50
Smokeless mine run.....	Columbus...		2.30	2.35	2.35	2.15@ 2.35
Smokeless screenings.....	Columbus...		1.35	1.30	1.30	1.25@ 1.35
Smokeless lump.....	Chicago...		6.10	4.60	4.60	4.50@ 4.75
Smokeless mine run.....	Chicago...		2.50	2.00	2.00	1.75@ 2.00
Smokeless lump.....	Cincinnati...		5.75	4.35	4.25	4.00@ 4.25
Smokeless mine run.....	Cincinnati...		2.10	2.10	2.25	2.00
Smokeless screenings.....	Cincinnati...		1.60	1.15	1.15	1.10@ 1.25
*Smokeless mine run.....	Boston...		4.40	4.40	4.45	4.45@ 4.50
Clearfield mine run.....	Boston...		2.05	2.05	2.00	1.65@ 2.10
Cambria mine run.....	Boston...		2.50	2.60	2.40	2.00@ 2.45
Somerset mine run.....	Boston...		2.25	2.05	2.15	1.85@ 2.25
Pool 1 (Navy Standard).....	New York...		3.00	2.75	2.75	2.50@ 3.00
Pool 1 (Navy Standard).....	Philadelphia...		3.05	2.70	2.70	2.50@ 2.90
Pool 1 (Navy Standard).....	Baltimore...			2.60	2.60	2.20@ 2.70
Pool 9 (Super. Low Vol.).....	New York...		2.30	2.10	2.10	2.00@ 2.25
Pool 9 (Super. Low Vol.).....	Philadelphia...		2.30	2.15	2.15	1.95@ 2.35
Pool 9 (Super. Low Vol.).....	Baltimore...		2.15	1.90	1.90	1.75@ 1.90
Pool 10 (H.Gr.Low Vol.).....	New York...		2.00	1.90	1.90	1.80@ 2.00
Pool 10 (H.Gr.Low Vol.).....	Philadelphia...		1.85	1.75	1.75	1.65@ 1.90
Pool 10 (H.Gr.Low Vol.).....	Baltimore...		2.10	1.70	1.70	1.65@ 1.70
Pool 11 (Low Vol.).....	New York...		1.65	1.60	1.60	1.55@ 1.75
Pool 11 (Low Vol.).....	Philadelphia...		1.55	1.45	1.45	1.35@ 1.60
Pool 11 (Low Vol.).....	Baltimore...		1.90	1.60	1.60	1.60@ 1.60
High-Volatile, Eastern		Market Quoted	Nov. 5 1923	Oct. 20 1924	Oct. 27 1924	Nov. 3 1924†
Pool 54-64 (Gas and St.).....	New York...		1.60	1.55	1.55	1.40@ 1.65
Pool 54-64 (Gas and St.).....	Philadelphia...		1.60	1.50	1.50	1.40@ 1.60
Pool 54-64 (Gas and St.).....	Baltimore...		1.75	1.50	1.50	1.45@ 1.60
Pittsburgh Sc'd gas.....	Pittsburgh...		2.55	2.40	2.40	2.30@ 2.50
Pittsburgh gas mine run.....	Pittsburgh...		2.25	2.10	2.10	2.00@ 2.25
Pittsburgh mine run (St.).....	Pittsburgh...		1.90	1.85	1.85	1.75@ 2.00
Pittsburgh slack (Gas).....	Pittsburgh...		1.05	1.20	1.20	1.15@ 1.25
Kanawha lump.....	Columbus...		3.00	2.55	2.55	2.35@ 2.75
Kanawha mine run.....	Columbus...		1.85	1.50	1.50	1.40@ 1.75
Kanawha screenings.....	Columbus...		.80	1.00	1.00	.85@ 1.10
W. Va. lump.....	Cincinnati...		3.25	3.10	3.00	2.60@ 3.25
W. Va. gas mine run.....	Cincinnati...		1.50	1.50	1.55	1.50@ 1.65
W. Va. steam mine run.....	Cincinnati...		1.50	1.35	1.45	1.40@ 1.60
W. Va. screenings.....	Cincinnati...		.85	.95	.95	.80@ 1.00
Hocking lump.....	Columbus...		2.95	2.55	2.55	2.40@ 2.75
Hocking mine run.....	Columbus...		1.85	1.55	1.55	1.50@ 1.70
Hocking screenings.....	Columbus...		.80	.85	.90	.65@ .85
Pitts. No. 8 lump.....	Cleveland...		2.55	2.40	2.40	2.00@ 2.85
Pitts. No. 8 mine run.....	Cleveland...		1.85	1.85	1.85	1.85@ 1.90
Pitts. No. 8 screenings.....	Cleveland...		.85	1.05	1.00	.95@ 1.05
Midwest		Market Quoted	Nov. 5 1923	Oct. 20 1924	Oct. 27 1924	Nov. 3 1924†
Franklin, Ill. lump.....	Chicago...		\$4.10	\$3.35	\$3.35	\$3.25@ \$3.50
Franklin, Ill. mine run.....	Chicago...		2.60	2.35	2.35	2.25@ 2.50
Franklin, Ill. screenings.....	Chicago...		1.45	1.35	1.35	1.25@ 1.50
Central, Ill. lump.....	Chicago...		3.10	2.85	2.85	2.75@ 3.00
Central, Ill. mine run.....	Chicago...		2.10	2.20	2.20	2.15@ 2.25
Central, Ill. screenings.....	Chicago...		1.05	1.15	1.15	1.00@ 1.25
Ind. 4th Vein lump.....	Chicago...		3.35	3.10	3.10	3.00@ 3.25
Ind. 4th Vein mine run.....	Chicago...		2.60	2.35	2.35	2.25@ 2.50
Ind. 4th Vein screenings.....	Chicago...		1.20	1.30	1.30	1.25@ 1.35
Ind. 5th Vein lump.....	Chicago...		2.50	2.85	2.85	2.75@ 3.00
Ind. 5th Vein mine run.....	Chicago...		2.10	2.10	2.10	2.00@ 2.25
Ind. 5th Vein screenings.....	Chicago...		.80	.95	.95	.80@ 1.10
Mt. Olive lump.....	St. Louis...		3.10	2.85	2.85	3.00
Mt. Olive mine run.....	St. Louis...		2.25	2.50	2.50	2.25@ 2.60
Mt. Olive screenings.....	St. Louis...		1.00	1.35	1.35	1.00@ 1.25
Standard lump.....	St. Louis...		3.05	2.85	2.85	2.75
Standard mine run.....	St. Louis...		2.05	2.20	2.20	1.90@ 2.00
Standard screenings.....	St. Louis...		.55	.80	.80	.60@ .70
West Ky. lump.....	Louisville...		2.60	3.35	3.10	3.00@ 3.15
West Ky. mine run.....	Louisville...		1.65	1.70	1.65	1.60@ 1.75
West Ky. screenings.....	Louisville...		.65	.70	.65	.60@ .70
West Ky. lump.....	Chicago...		12.60	2.75	2.75	2.50@ 3.00
West Ky. mine run.....	Chicago...		1.75	1.65	1.65	1.35@ 1.95
South and Southwest		Market Quoted	Nov. 5 1923	Oct. 20 1924	Oct. 27 1924	Nov. 3 1924†
Big Seam lump.....	Birmingham...		3.85	3.00	3.10	2.75@ 3.50
Big Seam mine run.....	Birmingham...		1.95	1.60	1.60	1.50@ 1.75
Big Seam (washed).....	Birmingham...		2.35	1.85	1.85	1.75@ 2.00
S. E. Ky. lump.....	Chicago...		3.00	2.85	2.85	2.75@ 3.00
S. E. Ky. mine run.....	Chicago...		2.25	1.60	1.60	1.50@ 1.75
S. E. Ky. lump.....	Louisville...		3.00	3.35	3.25	3.00@ 3.50
S. E. Ky. mine run.....	Louisville...		1.85	1.60	1.60	1.35@ 1.60
S. E. Ky. screenings.....	Louisville...		.75	.90	.85	.85@ 1.10
S. E. Ky. lump.....	Cincinnati...		3.35	3.35	3.10	2.75@ 3.25
S. E. Ky. mine run.....	Cincinnati...		1.50	1.55	1.55	1.35@ 1.75
S. E. Ky. screenings.....	Cincinnati...		.85	1.00	1.00	.75@ 1.10
Kansas lump.....	Kansas City...		5.00	5.00	5.00	5.00
Kansas mine run.....	Kansas City...		3.50	3.50	3.10	3.00@ 3.25
Kansas screenings.....	Kansas City...		2.25	2.00	2.00	2.00

\* Gross tons, f.o.b. vessel, Hampton Roads.

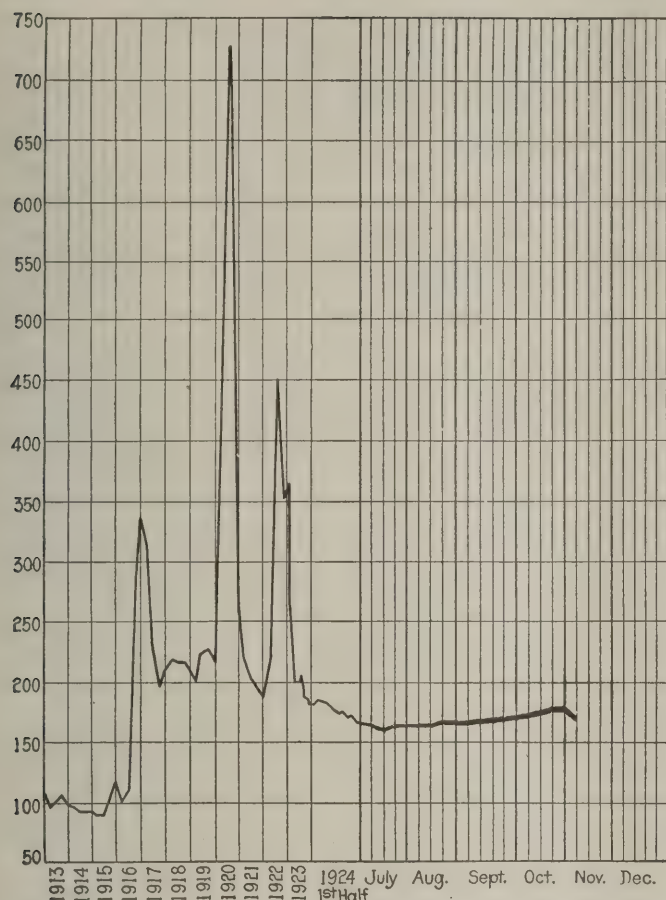
† Advances over previous week shown in heavy type, declines in italics.

### Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

		Market Quoted	Freight Rates	Nov. 5, 1923		Oct. 27, 1924		Nov. 3, 1924†	
				Independent	Company	Independent	Company	Independent	Company
Broken.....	New York.....		\$2.34	\$9.60@ 10.50	\$8.00@ \$9.25		\$8.00@ \$9.25		\$8.00@ \$9.25
Broken.....	Philadelphia.....		2.39				9.15		9.15
Egg.....	New York.....		2.34	9.85@ 12.25	8.75@ 9.25	\$9.25@ \$9.75	8.75@ 9.25	\$9.00@ \$9.75	8.75@ 9.25
Egg.....	Philadelphia.....		2.39	9.85@ 12.20	8.75@ 9.25	9.25@ 9.75	8.80@ 9.25	9.25@ 9.75	8.80@ 9.25
Egg.....	Chicago*.....		5.06	9.60@ 12.50	8.00@ 8.35	8.17@ 8.27	8.14@ 8.20	8.17@ 8.27	8.14@ 8.20
Stove.....	New York.....		2.34	9.85@ 12.25	8.75@ 9.25	10.00@ 10.50	8.75@ 9.50	10.00@ 10.25	8.75@ 9.50
Stove.....	Philadelphia.....		2.39	9.85@ 12.20	8.90@ 9.25	9.85@ 10.25	9.15@ 9.50	9.85@ 10.25	9.15@ 9.50
Stove.....	Chicago*.....		5.06	9.60@ 12.50	8.00@ 8.35	8.63@ 8.75	8.50@ 8.64	8.63@ 8.75	8.50@ 8.64
Chestnut.....	New York.....		2.34	9.85@ 12.25	8.75@ 9.25	9.50@ 10.25	8.75@ 9.25	9.50@ 10.25	8.75@ 9.25
Chestnut.....	Philadelphia.....		2.39	9.85@ 12.50	8.90@ 9.25	9.65@ 10.00	9.15@ 9.25	9.65@ 10.00	9.15@ 9.25
Chestnut.....	Chicago*.....		5.06	9.60@ 12.50	8.00@ 8.35	8.26@ 8.40	8.44@ 8.60	8.26@ 8.40	8.44@ 8.60
Pea.....	New York.....		2.22	6.76@ 8.25	6.15@ 6.65	5.25@ 5.50	5.50@ 6.00	5.00@ 5.50	5.50@ 6.00
Pea.....	Philadelphia.....		2.14	6.75@ 9.00	6.35@ 6.60	5.75@ 6.35	5.75@ 6.00	5.75@ 6.35	5.75@ 6.00
Pea.....	Chicago*.....		4.79	6.00@ 6.75	5.40@ 6.05	5.13@ 5.45	5.36@ 6.20	5.13@ 5.45	5.36@ 6.20
Buckwheat No. 1.....	New York.....		2.22	2.00@ 3.00	3.50	2.25@ 2.75	3.00@ 3.15	2.25@ 2.75	3.00@ 3.15
Buckwheat No. 1.....	Philadelphia.....		2.14	3.00@ 3.50	3.50	2.50@ 3.00	3.00	2.50@ 3.00	3.00
Rice.....	New York.....		2.22	1.50@ 2.15	2.50	1.80@ 2.15	2.00@ 3.25	1.80@ 2.15	2.00@ 2.25
Rice.....	Philadelphia.....		2.14	2.00@ 2.50	2.50	2.00@ 2.25	2.25	2.00@ 2.25	2.25
Barley.....	New York.....		2.22	1.00@ 1.50	1.50	1.25@ 1.50	1.50	1.25@ 1.50	1.50
Barley.....	Philadelphia.....		2.14	1.25@ 1.50	1.50	1.50	1.50	1.50	1.50
Birdseye.....	New York.....		2.22		1.60	1.35@ 1.60	1.60	1.35@ 1.60	1.60

\* Net tons, f.o.b. mines. † Advance over previous week shown in heavy type, declines in italics.





Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

Index	1924			1923
	Nov. 3	Oct. 27	Oct. 20	Nov. 5
Weighted average price	171	176	176	183
	\$2.07	\$2.12	\$2.12	\$2.21

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke; 1913-1918," published by the Geological Survey and the War Industries Board.

load steam shows some improvement, while carload steam is lagging and somewhat slow and hard to find. There is very little country steam business and country domestic is slow. There is practically no anthracite demand, smokeless has dropped off and coke is unusually slow.

### Kentucky Keeps Busy

Due to the fact that Kentucky is producing coal on a non-union basis, it has been possible to market production quite freely and over a wider radius than usual, in spite of mild weather, but prices are weaker. The top of the eastern Kentucky quotations to retailers is around \$3.50 for best block and \$3.15 for western Kentucky. Good coal can be had as low as \$3 in either field. Mine run is \$1.50@1.75 in either field, and screenings are 60@70c. in western Kentucky and 85c. to around \$1.10 in eastern Kentucky.

Western Kentucky production has been increasing because several former unionized mines that were on strike have resumed operations. The lower end of the field is now running quite well, and it looks as if it will be only a short time before the Central City section of the field will show developments favoring production in a number of mines that have been down for nearly seven months.

### Northwest Trade Rather Dull

Trade remains dull at Duluth, the only feature being the demand for coal from North Dakota to take the place of cheap lignite used there last year. The good crop, and consequent financial affluence, together with the fact that lignite has not proved popular has tended to help bring back the market. Despite the lack of trade, prices are strong all along the line. There has been no change since last quoted. Coke is coming into popularity as it is priced at \$8.50.

Smokeless coals continue popular. The problem now is to find an outlet for soft coal screenings. The commercial buildings are being urged to use them, but of course they can do so only when they stoke by hand. The docks are trying to work up a trade in buckwheat for commercial heating, which trade was lost during the war when only bituminous was available.

Twenty-nine cargoes arrived at Duluth last week, of which only one was hard coal. Twelve are on the way from lower lake ports, of which one is hard coal. The drop off in anthracite seems to be in direct ratio to the demand, which is at low ebb.

The all-rail coal trade at the Twin Cities is shifting somewhat from southern Illinois to the other sections of that state and to Indiana, because of freight rates. Coal buyers seem to be adhering to all-rail coal, as far as they are buying at all, for there seems to have been little or no changing to dock since the extra 28c. on freight from southern Illinois became effective.

Railroad consumption in the Northwest has been materially increased in the last 60 days, for the grain movement has been the heaviest in a number of years. The roads have done excellent work in keeping traffic moving, but embargoes have been necessary to allow a cleanup twice.

The driest October in the history of Wisconsin and one of the warmest Octobers in the meteorological records has put the coal trade at Milwaukee in the doldrums. Wholesalers and retailers report no change in conditions from a week ago. But when colder weather does come—as it must—they expect a rush of orders, with increasing difficulty in getting supplies of certain grades because of the sold-up conditions at the mines, and also further trouble as to shipping equipment, as gondolas are short here.

Coal is coming to Milwaukee quite steadily by lake. The receipts during October, up to the 29th, were 104,640 tons of anthracite and 317,984 tons of bituminous coal, making the totals for the year thus far 677,294 tons of anthracite and 2,013,294 tons of bituminous coal. The receipts for the lake season of 1923, up to Oct. 29, inclusive, were 757,824 tons of anthracite and 2,522,101 tons of bituminous coal.

### Warmth Retards Western Business

In the Southwest a continuation of warm weather is causing the surplus of all grades to mount. Dealers have shown an unwillingness to lay in heavy supplies against the midwinter demand, so it is considered likely that with the arrival of winter it will be necessary to open more mines to take care of orders. Reports from Arkansas continue pessimistic. There several mines have been closed down entirely, due principally to the extreme difficulty of moving screenings. Kansas City prices are unchanged.

The market in Colorado is moving along fairly well with production continuing to show a slight increase each week. The extreme warm weather, however, is hard on domestic trade. Colorado mines worked on an average of thirty hours last week and, according to reports from the operators, only 23 per cent of the working time lost was attributed to "no market."

The car situation in Utah grows worse daily. Salt Lake City orders are cared for, but there is not enough of the right equipment for other markets. "We are getting very short of box cars and dump cars," said an official of one big wholesale company. This company has had to hold up an Idaho order for a week as a result of the car situation. The sugar beet harvest is largely responsible for the shortage. The market for Utah coal on the Pacific Coast is holding up better now than any other for Utah producers.

### Ohio Business Wilts in Warm Weather

Mild weather has caused the Cincinnati market to flop. Southeastern Kentucky operators are holding a stiff upper lip, but only a few ask \$3.25 for block and some sales of pretty good stuff are being made at \$2.75. West Virginia producers are settling around a \$3 asked price with sales down to \$2.50 for the low grades. Less and less interest is being displayed in egg and 2-in. as the end of the lake season nears. Run of mine is even stronger than a month ago. Good grades of gas are selling around \$1.50 with some Harlan and choicer grades up to \$1.75. Splints are around \$1.40 and in between grades are no lower than \$1.35. Slack has retreated a little on low grades with the better stuff holding firm. Smokeless prices show considerable divergence. River business has been hard hit by drought.

Dullness in steam business and hesitancy on the part of dealers to stock up further in the face of milder weather



sums up the situation at Columbus. Buying is limited to immediate wants and the trade is waiting. The domestic trade is wholly a weather proposition and until lower temperatures prevail there will not be a great deal doing.

The coal business at Cleveland is pretty much at a standstill so far as demand is concerned. Inquiries have been noticeably absent during the week, awaiting the outcome of the election. Should the result adversely affect business conditions, some softening in prices may be the outcome, but even if the result be favorable to business, prices are not likely to advance. Mild temperature has had a deterrent effect upon domestic demand and prices on smokeless fuels have receded about 50c. per ton. The steam buyer is content to continue a hand-to-mouth program.

### Demand Tapers Off at Pittsburgh

Demand seems to have decreased a little further at Pittsburgh in the past week, this being attributed to the influence of the election and mild weather. Production is holding at fully 50 per cent, the increased operation being largely in shipments by producers to regular customers. There has been a smaller increase in the turnover in the open market, in spot and prompt lots. Prices continue to show no change, the steadiness causing comment. On account of heavy production of domestic coal, slack has been pressing on the market, but prices hold fairly well.

Business is quiet all along the line at Buffalo; everybody is complaining. Some shippers say that their October trade will not show up as well as September did and but few find it to have been really better.

### New England Notes Favorable Undertone

In New England the undertone is favorable, but as yet there has been little change in prices. Buyers who postponed their purchases were finally obliged to enter the market, but aside from these there is no demand strong enough to support any pronounced upward swing.

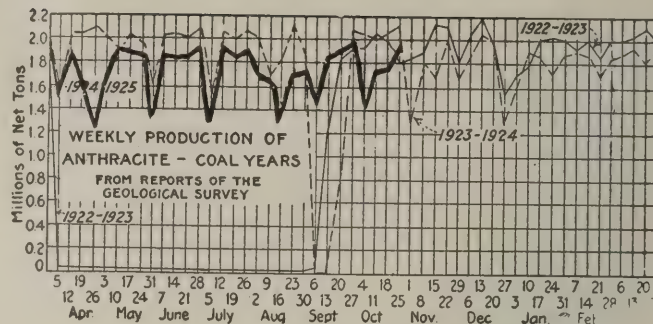
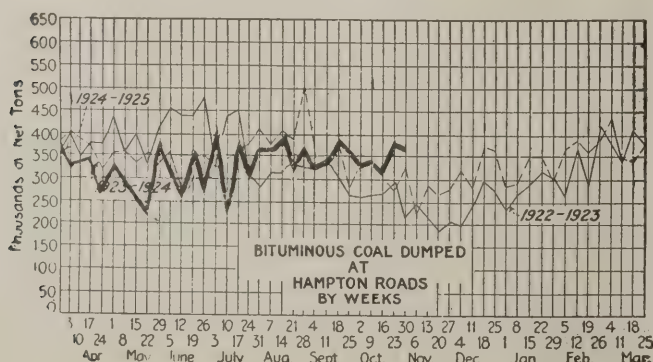
At Hampton Roads smokeless coals are being held at \$4.45@ \$4.50 per gross ton f.o.b. vessel for No. 1 grade. Current receipts at the piers are being absorbed either on contract or on a spot basis close to the figures named. Mild request off-shore together with extra business coastwise has taken care of current restricted output, but in the judgment of many a material lift in prices would again paralyze what buying power there is.

On cars Boston, Providence and Portland there is a fair spot demand with prices averaging around \$5.50 per gross ton for coals on the Navy acceptable list. At Providence and Portland, especially at the latter port, a few factors are asking \$5.75, and for single car lots as high as \$5.90, but there is no great urgency on the part of buyers.

Shippers of quality coals in central Pennsylvania for delivery all rail are gradually picking up 30- to 60-day business at the minimum price basis established some months ago; \$2.25 for good "B" vein is about the level, but one has only to make a rough computation to see how far out of line such a figure is with Pocohontas and New River in the non-union area.

### Atlantic Markets Slow Down

Buying of soft coal is lower at New York. Consumers were believed to be holding off until after election day, but with that out of the way operators are wondering when the market will improve. Much depends on weather conditions. Consumers claim to have plenty of coal on hand and do not seem to be worrying over a possible car shortage or difficulty in getting coal when they want it. Prices continue to show a wide range, but are holding to a steady level despite



heavy production and the opening of additional mines in the Pennsylvania field.

The Philadelphia market has slowed down a trifle though there are reports of better business in most lines of industry. Prices still refuse to rise and with a greater number of mines operating on a non-union basis this alone will be sufficient to hold down spot quotations. Railway fuel is moving along at a fairly good rate. Slack appears in good supply, with all industries that use this fuel still willing to stock up on it. Tide shipments are better.

Increased demand at Baltimore about ten days ago caused an upward price movement for both better grade steam and gas coals. The resultant movement of fuel caused a drop in prices. The market has slumped off, and there have been offerings of exceptional advantage to buyers. Exports of coal have dropped behind those of September.

Some improvement in industrial demand is reported at Birmingham with gradual trend toward steadier operations at plants. Current requirements are being taken care of by buyers at present, with little tonnage for reserves. Bunker trade has improved with a fairly good tonnage being handled at Mobile, Pensacola and New Orleans from this district. Foreign shipping is taking the bulk of the fuel bunkered. Steam prices are steady and domestic quotations are about to show some changes in November.

### Mild Weather Handicaps Anthracite Trade

Encouraged by weather conditions, New York consumers of anthracite continue to buy slowly. Wholesalers and producers are kept busy endeavoring to prevent an accumulation of the various sizes and persuading retailers to take additional tonnages of sizes for which the demand is slow. Independent quotations remain steady, but this is attributed in most part to smaller receipts due to the mines being idle on Mitchell Day and All Saints' Day and to intermittent labor troubles. Egg is moving better than for several weeks, due to consumers taking it in place of stove when informed of the shortage of the latter size. Pea and chestnut continue in slow demand. There is plenty of the former to be had and several loaded boats dot the New York harbor.

Activity in the retail trade at Philadelphia quickly fell off during the week owing to the mild temperature. The mines are fast recovering from the flood, but are far behind on orders for stove and nut. Retailers have fair stocks. Pea and egg are quiet; barley is well taken, and buckwheat and rice are in easy supply. Company producers have not made any price increase for November. Independents have been slow to announce prices, but they probably will add something to stove and nut.

A reminder of winter at Baltimore has brought increased ordering from householders. Dealers report the demand for stove as the most active, with egg and chestnut running next in demand. The usual difficulties of disposing of pea and buckwheat for household use are being encountered.

Buffalo retailers are concerned over the number of oil-burning homes in the city, though natural gas is eating into the hard-coal trade most of any of its competitors. Nevertheless there is the usual shortage of stove coal and the consumer refuses to be convinced that he can use any other size in place of it. The demand for coke does not improve much in spite of the effort to push it.

### Car Loadings

	Cars Loaded	
	All Cars	Coal Cars
Week ended Oct. 18, 1924.....	1,102,336	191,449
Previous week.....	1,088,462	198,154
Week ended Oct. 20, 1923.....	1,072,881	192,864



## Foreign Market And Export News

### General Outlook Better in British Market But Steam Coals Still Lag

The Welsh steam coal trade is not more active though there are signs of a probable improvement in the near future. Anthracite is in demand, and collieries producing this coal cannot keep pace with the requirements in spite of the fact that output is mounting. The depression is confined almost entirely to steam coals. Many of the steam coal collieries are still working less than half time, and several pits have been stopped for as much as eight or nine days in succession, although not definitely closed down. The general outlook has improved slightly, because buyers, who have been holding off for a long time in the hope of forcing prices lower, are now coming on the market.

A few inquiries have been circulating in Newcastle during the past week, but none is sufficient to alter the general position of the market, which remains dull and easy with ample supplies of coal. The Bordeaux Gas Works has placed contracts through French firms for the supply of about 8,000 tons of Durham gas coals. The Egyptian State and Sudan railways are in the market for 200,000 tons; Sao Paulo Ry. 85,000; the British Admiralty, 300,000 to 400,000; the French navy, 43,000. The Palermo Gas Works has invited tenders for 5,000 tons of Holmside or Wear special gas coals for shipment to Palermo during early December.

The Northumberland coal mining ascertainment of the proceeds and costs in the months of June, July and August, which regulate wages in October, shows that there was a surplus of £228,216, of which 88 per cent, or £200,830, was applicable to wages and 12 per cent, or £27,386, to profits. The total wages for the current month would equal 75.58 per cent on the 1879 basis, but under the National Agreement wages cannot be lower than 100 per cent on that basis.

Production by British collieries dur-

ing the week ended Oct. 18, a cable to *Coal Age* states, was 5,147,000 tons, according to the official reports. This compares with 5,088,000 tons during the week ended Oct. 18.

#### Hampton Roads Market Weak; Foreign Movement Gains

The market at Hampton Roads is somewhat weaker, with a falling off in movement and with demand generally reported somewhat lighter, due to mild weather and other causes. Foreign movement shows a slight increase, but coastwise and bunker trades are barely holding their own.

Dealers report that the market probably would not hold even its present strength but for the slow-up in shipments from the mines to tidewater. Accumulations at the piers are below normal, due more to lack of shipments than to undue demand for cargoes.

The outlook for better business is bright, but dealers do not anticipate any material change in prices.

#### French Coal Consumption Low But Prices Are Steady

In the French market the consumption of industrial coals remains slack and that of domestic fuels slightly lower, but stocks are not important and prices keep steady.

Imports of Cardiff coals during the week have been below normal. Despite the pressure of exchange, slight concessions have been made on c.i.f. prices, but they are still too high to attract much business. Purchases of house and anthracite coals are extremely limited.

The recent decline of 10 per cent in the mine price of German coal caused some apprehension for a while in the French collieries, as it was feared that the market would be overrun with the German product, but German prices

are still too high to bring any dangerous competition. Now that the Franco-Belgian régime has ceased to operate, however, it is likely that transportation costs will be cut by the Germans, and thus increase competition.

#### Export Clearances, Week Ended Nov. 1, 1924

##### FROM HAMPTON ROADS

	Tons
For Argentina:	9,281
Ital. Str. Sile for Buenos Aires.....	
For Brazil:	
Amer. Str. Orinoco for Rio de Janeiro	6,019
For Canada:	
Nor. Str. Gunnar Heiberg for Montreal	3,622
For Egypt:	
Br. Str. Cyclops for Part Said.....	2,216
For France:	
Fr. Str. P. L. M. 20 for Dunkirk....	8,364
For Italy:	
Ital. Str. Morro Castle for Porto Ferrajo	2,767
Ital. Str. Maria Enrica for Porto Ferrajo	10,668
For Peru:	
Nor. Str. Herakles for Callao.....	1,472
Peru. Str. Perene for Iquitos	254
For West Indies:	
Dan. Str. Norslys for Fort de France	5,917
Swed. Str. Freja for Kingston.....	1,905

##### FROM PHILADELPHIA

For Newfoundland:	
Dan. Str. Nordkap, for Corner-Brook	
For Trinidad:	
Am. Schr. A. Ernest Mills, for Galien and Trinity Bay	
For Cuba:	
Br. Str. Muncove, for Havana	

##### FROM BALTIMORE

For Italy:	
Ital. Str. Caroline for Trieste.....	3,159
For West Indies:	
Am. Schr. T. N. Barnsdale for Fort de France	994
For Cuba:	
Am. Schr. Virginia Dare for Cai-barien	2,417

#### Hampton Roads Pier Situation

N. & W. Piers, Lamberts Pt.:	Oct. 23	Oct. 30
Cars on hand.....	897	947
Tons on hand.....	55,076	60,376
Tons dumped for week.....	120,512	123,808
Tonnage waiting.....	10,000	5,000
Virginian Piers, Sewalls Pt.:		
Cars on hand.....	1,244	1,434
Tons on hand.....	85,400	98,950
Tons dumped for week.....	118,360	98,183
Tonnage waiting.....	17,487	18,455
C. & O. Piers, Newport News:		
Cars on hand.....	1,913	1,734
Tons on hand.....	101,455	98,041
Tons dumped for week.....	104,225	102,847
Tonnage waiting.....	8,815	2,195

#### Pier and Bunker Prices, Gross Tons

PIERS	Oct. 25	Nov. 1†
Pool 9, New York...	\$4.80@ \$5.10	\$4.75@ \$5.00
Pool 10, New York...	4.65@ 4.80	4.65@ 4.80
Pool 11, New York...	4.40@ 4.55	4.40@ 4.55
Pool 9, Philadelphia...	4.90@ 5.25	4.90@ 5.25
Pool 10, Philadelphia...	4.45@ 4.70	4.45@ 4.70
Pool 11, Philadelphia...	4.30@ 4.50	4.30@ 4.50
Pool 1, Hamp. Roads	4.35@ 4.00	4.30
Pool 2, Hamp. Roads	4.15	4.15
Pools 5-6-7 Hamp. Rds.	4.00@ 4.10	4.00

##### BUNKERS

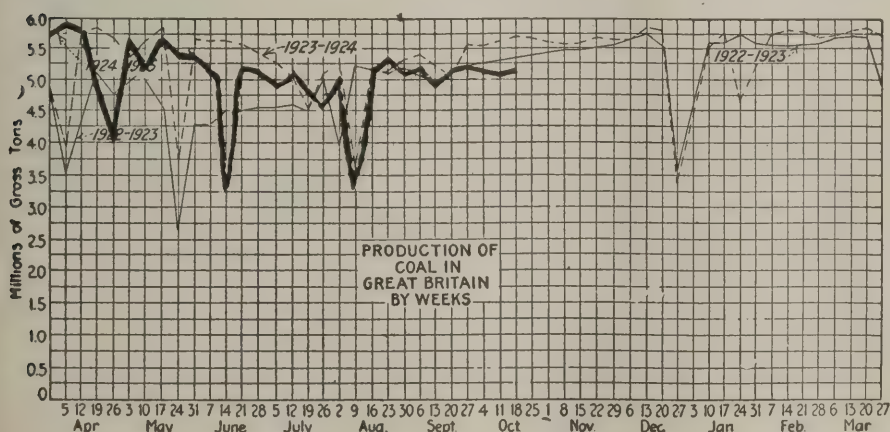
Pool 9, New York...	\$5.05@ \$5.35	\$5.00@ \$5.25
Pool 10, New York...	4.90@ 5.05	4.90@ 5.05
Pool 11, New York...	4.65@ 4.80	4.65@ 4.80
Pool 9, Philadelphia...	4.90@ 5.25	4.90@ 5.25
Pool 10, Philadelphia...	4.75@ 4.95	4.75@ 4.95
Pool 11, Philadelphia...	4.50@ 4.70	4.50@ 4.70
Pool 1, Hamp. Roads	4.50	4.40
Pool 2, Hamp. Roads	4.25	4.25
Pools 5-6-7 Hamp. Rds.	4.10	4.10

#### Current Quotations British Coal f.o.b. Port, Gross Tons

##### Quotations by Cable to Coal Age

Cardiff:	Oct. 25	Nov. 1†
Admiralty, large...	27s. @ 27s. 6d.	27s. @ 27s. 6d.
Steam smalls.....	15s. 6d. @ 16s.	16s.
Newcastle:		
Best steams.....	18s. 6d.	17s. 6d. @ 22s. 6d.
Best gas.....	20s. 6d. @ 21s.	20s. 6d.
Best bunkers.....	17s. 6d. @ 18s. 6d.	18s. 6d. @ 19s.

†Advances over previous week shown in heavy type, declines in italics.







## News Items From Field and Trade



### ALABAMA

The Pittsburg & Southern Coal & Iron Co. has sold to C. M. Green, of Birmingham, approximately 600 acres of mineral lands in Sec. 6, Tp. 16, Range 2 West, and in Sec. 1, Tp. 16, Range 3 West, located near New Castle, Jefferson County, for a consideration of \$50,000.

The long drought in the Birmingham district is causing a serious problem in coal-mining operations where washeries are employed. The supply of water from the smaller creeks and branches is insufficient to meet the needs at many points, and inconvenience and delay are being experienced in the coal fields on this account.

### ALASKA

A heavy coal deposit in northern Alaska, north of the Endicott range, has been reported to Washington by Philip S. Smith, geologist for the U. S. Geological Survey, who has recently returned from a long exploration trip in that region. The foothills and valleys north of the Endicott range contain great bodies of coal, indicating that Alaska, in past ages had a temperate, if not subtropical climate producing coal-forming vegetation unknown in the region now, he concluded in an interview at Seattle just after returning.

### COLORADO

Wm. B. Lewis of New York City president of the Oakdale and Alamo Coal companies, was in Colorado last week, where he inspected his holdings in this state, which included the Oakdale and the new Alamo mines in the Walsenburg district. The latter mine is considered the most up-to-date mine west of the Mississippi.

### ILLINOIS

The Niantic Coal Co., operating a mine ten miles west of Decatur has resumed operations.

The Fallon Coal Co. with mining property at O'Fallon, is in trouble with certain of its stockholders who live in and near Bay City, Mich. They have filed a petition in the Tuscola County district court asking an accounting of the funds and a dissolution of the company.

In a prize name contest the new employees magazine of the Southern Coal, Coke & Mining Co. gets the title "Yours and Mine." Several hundred names were suggested by employees, customers and friends of the company.

The magazine evidently aims to be a real employees' paper, for it publishes even kicks of employees against the company, together with fitting answers. The November issue is to be "election number."

The Valier mine, in southern Illinois, built by Carl Scholz and owned and operated by the Burlington R.R., is hanging up new production records which are worthy of note. On Oct. 29 this mine, long rated in the 6,000-ton class, hoisted 7,704 tons, which is its own "farthest north." On the Monday previous it had set a new record for itself by producing 7,127 tons. And to prove that the men did not hold back a lot of coal on the day before the grand burst of Oct. 29, it is reported that the mine hoisted on the 28th 7,096 tons, which would not leave much chance for a charge that the mine had been "loaded" for the big run next day. On the big day 1,740 pit cars were dumped in an 8-hour day in which 38 minutes time was lost. F. F. Green is superintendent of this mine and Charles E. Anderson, underground manager.

A large mule barn was burned down Saturday night, Oct. 25 at the Paradise Coal Co.'s mine at Duquoin. Luckily the wind was low and the fire did not spread to any of the adjoining top buildings. Several tons of hay and a number of mine mules were lost.

George Adams, of Matherville, has been appointed as mine manager for the mine of the Rex Coal Co., at Coal Valley, filling a vacancy caused by the death of Thomas Mills.

The weigh office in the tippie and a portion of the tippie itself at the Harco mine, near Harrisburg, was destroyed by fire Oct. 23. Several hundred men employed at the plant will be idle until repairs can be made.

Frank F. Tirre was recently appointed general manager and is in charge of the St. Louis office of the Mulberry Hill Coal Co. The company is now handling its own distribution. Its property is the Mulberry Hill mine near Belleville.

According to reports compiled by County Mine Inspector John O'Brien, of La Salle County, a total of 575,652 tons of coal was mined in that county last year. The men employed in the mines during the period numbered 971, the mines working an average of 166 days during the year.

The total output of mines in Illinois was 72,308,655 tons during the fiscal year ending June 30, 1924, according to reports compiled by Martin Bolt, Director of the State Department of Mines and Minerals of Illinois, at

Springfield. The report indicates that over 70,000,000 tons was produced by shipping mines, the balance by local and wagon mines in small amounts.

A small loss was sustained by the Scott-Smith Coal Co. Oct. 26 when the office and weigh room of its strip mine, near Duquoin, was burned. The fire was of unknown origin.

### KENTUCKY

It was reported from Owensboro on Oct. 18 that one man was killed and four injured, in a heavy slate fall at the Rockport Coal Co. mine at Centertown. It was stated that the cage fell, and in doing so dislodged a lot of slate from the sides of the shaft.

### MASSACHUSETTS

The Island Creek Coal Co. reports net profit of \$478,900 for the third quarter of 1924, compared with \$623,634 in the corresponding period of last year. For the nine months the company earned \$1,915,774 available for the common stock, compared with \$1,984,864 last year. The company mined 1,424,409 tons of coal in the third quarter of this year, compared with 854,728 last year, but its gross profit was only \$747,420 in 1924, compared with \$859,985 in 1923.

### MONTANA

Meagher County is considerably wrought up over a report that Eastern capital, possibly Henry Ford's, has bought up a large acreage of iron land in the Sheep Creek territory and that a blast furnace and steel mill will soon be erected either in Meagher County or in Great Falls, consuming a heavy tonnage of Montana coal.

### OHIO

The Kentucky River Coal Sales Co., with headquarters in Chicago, has closed the Cincinnati branch office it had maintained for nearly two years on the sixth floor of the Dixie Terminal Building.

Paul Barnett, formerly a banker in the Logan (W. Va.) district, is now associated with the Cincinnati office of the Raleigh Smokeless Coal Co. learning the business end of the coal industry.

Foreclosure proceedings have been instituted by the bondholders on the property of the Maynard Coal Co., of Columbus, which was forced into the hands of receivers about six months ago. The bondholders will soon obtain an order of sale and the various prop-



erties will be advertised by the receivers. W. S. Harmon and Frank L. Stein. The properties consist of large coal mines in the Pomeroy field, Ohio, and the Hazard field in Kentucky.

Under order of court the property of the Dean Coal & Coke Co., which had offices in Columbus, were offered for sale by Receiver Ralph E. Marburger Nov. 3. The property, which was forced into the hands of receiver about eight months ago, was appraised at \$20,516.50.

The Sixty-Eight Mining Co., recently chartered with 750 shares of stock, no par value designated, has been organized by the election of A. R. Jones, president, George Gibbs, vice-president and H. E. Cleary, secretary-treasurer. The company has two operating mines near Athens in the Hocking Valley field. Offices are located in the Stoneman Building, Columbus.

## PENNSYLVANIA

On October 27 the blacksmith shop of the Connellsville Central Coke Co.'s Herbert plant was completely destroyed by fire. The plant had been idle for several months, but the shop will be rebuilt at once.

The Derry No. 1 plant of the Latrobe-Connellsville Coal & Coke Co., located at Bradenville, resumed operations Oct. 27 after a shutdown of almost a year. The plant was scheduled to resume operations last spring when an order for railroad coal was obtained, but after placing the order the railroad deferred taking any coal. The mine has been put in first-class condition and has been equipped with coal-cleaning apparatus. The mine will give employment to a large number of men, most of whom are former employees.

Mining operations at the No. 10 slope of the Lehigh Valley Coal Co. near Drifton are to be discontinued in the near future. The men now employed there will be given jobs at other plants of the company.

Purchase of coal lands in North and East Union Townships by the South Penn Collieries Co., of Philadelphia, according to the revenue stamps on the deeds, recorded Oct. 25, involved \$400,000. The sellers were as follows:

Jennie J. Dull, in East Union Township, for which was paid \$172,000; William H. Shepp, in North and East Union Townships, for \$140,000; Rachael Deeber, in East Union for \$88,000.

For the first time in the history of district 9, every man and boy employed in and about the mines is enrolled as a member of the United Mine Workers, President Golden of the district reports. The 100 per cent enrollment is attributed to the shift made two years ago from local unions to colliery locals, the change permitting a closer supervision of the various employees.

The Pennsylvania Coal & Coke Corp. for the quarter ended Sept. 30, 1924, reports a deficit of \$147,547 after depreciation and depletion, but before federal taxes, against a surplus of \$159,957 in the third quarter of 1923. The deficit for the first nine months of 1924 totaled \$288,655 after charges, but before federal taxes, against a surplus of \$741,963 in the same period of 1923. Federal taxes for nine months are estimated at \$8,000.

The first labor temple to be erected by the United Mine Workers in the anthracite field was dedicated on Mitchell Day, Oct. 29, at Olyphant. The building was purchased and remodeled to serve the purposes of the union, by four locals in the town of Olyphant at a cost of \$25,000. District President Thomas Kennedy, of District 7, made the dedication address.

Visitors from various parts of the United States, Canada, Great Britain and Czechoslovakia recently inspected the gravity coal-cleaning plant that serves several mines of Peale, Peacock & Kerr, Inc., one of the largest producers in the district.

Boyd C. Osler, chief engineer of the Hazle Brook Coal Co., Hazleton, has resigned to become general superintendent of the newly organized Shamokin Coal Co., which is reopening the old Neilson colliery, near Shamokin.

All of the collieries in the anthracite field were idle on election day. The miners were instructed to get out and work for labor candidates in the various districts during the day. The political activities by the union men were especially manifested in District 1.

The Harleigh Coal Co., which is

erecting a washery at Harleigh, is preparing to have the steel work installed. The Lehigh Valley R.R. is extending its tracks to the washery. Once the plant starts to operate the refuse is to be dumped into the abandoned strip-pings near by. The Harleigh Coal Co. is composed of Freeland, Scranton, and New York capitalists.

A high powered electric engine has been installed in No. 4 slope, Alaska mine, of the Philadelphia & Reading Coal & Iron Corporation in Shamokin. This slope is 2,400 ft. long. The present engine is able to haul but three cars up the slope and ten minutes is required to finish the trip. The more powerful engine will haul four cars and will complete the trip in two minutes. Officials expect that with the increased pulling power the output of the mine will be greatly increased.

E. Kent Davis, chief engineer of Peale, Peacock & Kerr, at St. Benedict, will speak at the next session of the Pennsylvania Coal Mining Institute, which will be held Nov. 21. The announcement was made at the opening session of the fall and winter season at Johnston last week.

Secretary James W. McAndrew, of District 9, United Mine Workers, at a session of the biennial convention of the district at Shenandoah, reported that the district membership of the organization on Dec. 1, 1923, broke all records, reaching a total of 56,440½ paid-up members and an exonerated list of 2,796, making a grand total of 59,209½. The two-year average of the union was announced at 37,309, with an exonerated list of 3,073. The district collected a total of \$227,468.46 with expenses of \$158,379. The balance in the treasury of the district Oct. 1, this year, was \$142,759.45. The change from local unions to colliery locals resulted in the reduction of the total number of locals from 162 to 89.

Unity of practically all major interests in the central Pennsylvania field in the matter of labor policy is assured by the announcement that the Pennsylvania Coal & Coke Corporation and the Clearfield Bituminous Coal Corporation are again members of the Bituminous Coal Operators' Association of Central Pennsylvania.

Union officials from both the anthracite and bituminous fields of the state will meet in Harrisburg Nov. 12 and 13 to draft a program for presentation at the next session of the Legislature. The miners want an old age pension law as well as certain changes in the mine safety laws and the workmen's compensation act.

## UTAH

The Consumers' Mutual Coal Co. is planning to mine and ship coal from its property in Carbon County about Dec. 13. It owns 1,800 acres of coal land in the county. The mine will be equipped to produce 2,000 tons daily, it is stated, but the initial production will be far less than that. Loading machines and belt conveyors will be used. There will be no cars, except for carrying supplies. The Consumers' is the newest coal mining concern to be started here on the mutual plan. It purchased the yard of



General Office and Bank, Phelps Dodge Corporation

Located at the coal mines of the company, in Dawson, N. M., it conforms in degree with the style of architecture of old Mexico.



the Dunyon Coal Co., of Salt Lake City, for the purpose of distributing its coal locally.

The application of the Diamond Coal Co., of Salt Lake City, for permission to sell 100,000 shares of stock at 10c. a share has been held up by the Utah Securities Commission until sufficient work has been done on the company's property to show the grade of coal and the thickness of the bed. The property is located in the American Fork Canyon, Utah County.

The State Industrial Commission has placed two men on duty in the Spring Canyon district, where the Rains mine blew up in September, and it is stated they will be kept there until rock dusting and the erection of rock barriers in all mines in that district have been completed. These men are making regular inspections of the mine, it is stated, and by co-operating with the operators are keeping the men keyed up on safety. The mine department of the commission, which is consolidated with the local office of the federal Bureau of Mines, has not yet issued its report concerning the cause of the Rains explosion.

## WASHINGTON

The new mine of the Black Carbon Coal Co., near Buckley, got into operation with a formal opening Oct. 15. It is electrically equipped and has a capacity of approximately 300 tons a day. A washery is located at the mine. Fraser H. Lantz is president and general manager and David Gray is superintendent.

An attempt to interest English shipping interests in coaling ships at the Pacific Coast Coal Co. bunkers in Seattle has taken Wylie Hemphill, sales manager of the coal company, to England on a trip on which he is accompanied by Mrs. Hemphill.

## WEST VIRGINIA

The name of the Waddles Run Coal Co. has been changed to the Washington Heights Improvement Co.

The Beluan Coal Co., chartered under the laws of Ohio, of which C. A. McFadden of Wheeling is president, has been authorized to transact business in West Virginia, as has the Consolidated Coal & Oil Corporation, chartered under the laws of Delaware.

The following West Virginia coal concerns have surrendered their charters to the Secretary of State of West Virginia: Guyan Coal & Coke Co., Corrado Fairmont Coal Co. and the D. T. S. Coal Co.

The Quincy Coal Co. has moved its principal office from Charleston to Quincy.

The United Mine Workers has instituted suit in the Circuit Court of Marion County for \$50,000 damages against the Brady-Warner Coal Corporation, charging that the coal company was responsible for the destruction by fire on June 19 of the present year of the miners' hall at Brady. The hall burned down during a clash between union miners and men engaged in guarding

the company's property. It is contended by the union that the company guards set fire to the building. There are two separate suits of \$25,000 each.

The Pocahontas Fuel Co. has announced a resumption of operations at its Itmann mine, in Wyoming County, which has been shut down for several months. This is one of the largest operations in Wyoming County and the company recently completed construction work on a model store building, constructed of native stone taken from the mountains surrounding the property.

Several companies which recently began operations in the Kanawha field on an open-shop basis are increasing production. The Campbells Creek Coal Co., which has been operating union mines for several years, is now shipping about 800 tons a day out of the Campbells Creek field via Dana, and the New Export Coal Co. has a production of about 400 tons a day. The Winifrede Coal Co. also is managing to increase production inasmuch as it is now loading about 1,000 tons a day at its mines out of Winifrede Junction on the Kanawha River.

The Philadelphia-Cleveland Coal Co. has just completed a new coal-loading dock and tippie in Huntington representing an outlay of \$250,000. The dock will have a capacity of 5,000 tons per ten-hour day and more than a million tons a year. In loading coal from cars to barges the company uses a large stationary conveyor, a movable conveyor and a pan conveyor. The company has its own dummy engine for placing loaded coal cars. All machinery is operated by electricity.

## WYOMING

The old mine at Point of Rocks, east of Rock Springs on the Union Pacific, is to be opened again. M. Mitter, of Denver, head of the Rock Springs Coal & Mining Co., says he has a contract for 140,000 tons of coal and will start the mine soon. A spur track must be rebuilt to the mine if any coal is to be taken out. The mine has been operated for short periods by several owners in the past.

## CANADA

Roy M. Wolvin, of Besco, president of the British Empire Steel Corporation, intimated during his recent visit to Cape Breton, that he would welcome early negotiations with the coal miners for a new wage scale to take the place of the one that expires Jan. 25.

It has been decided by the Toronto Board of Education to install coal-burning furnaces instead of oil heaters in the new High School of Commerce. C. J. Doughty, superintendent of maintenance for the schools, stated that if coal were used instead of oil throughout the schools it would effect a saving averaging \$500 a year for each school.

Importation of bituminous coal into Canada from the United States fell from 15,729,578 tons during the twelve months ended September, 1923, to 13,319,130, during the twelve months ended last month. Anthracite importa-

tion fell, during the same comparative periods, from 5,090,567 tons to 3,897,662 tons. Owing largely to industrial conditions in Alberta the exportation of Canadian coal to the United States fell from more than 7,000,000 tons during the twelve months ending September, 1923, to 2,325,676 tons during the past twelve months.

Some important changes have been made in the directorate of the British Empire Steel Corporation and constituent companies. Senator Lorne C. Webster, of Montreal, has been appointed a member of the board, and Viscount Furness and Benjamin Talbot, two of the British directors, have resigned. The reason assigned is that they are unable to attend the board meetings.

It having been alleged that the coal dealers of Winnipeg have entered into a price regulating agreement, under which customers have to pay more than they otherwise would, and are engaged in a movement to eliminate competition by cutting off sources of supply to those refusing to maintain a fixed price, an inquiry has been ordered under the Combines Investigation Act. D. Campbell, K.C., of Winnipeg, has been appointed a commissioner to investigate the alleged combine.

Coal production in the Telkwa Valley, northern British Columbia, again is promised. With the coming of winter and the increased domestic demand in Prince Rupert and other communities along the line of the Canadian National Ry. some of the Telkwa coal seams will be exploited. The Telkwa Coal Mines, it is reported, already has started work and expects to be in a position to supply most of the local requirements.

## Trade Literature

**The Lincoln Greasing System for Mine Cars.** Lincoln Steel & Forge Co., St. Louis, Mo. Pp. 7; 8 x 11 in.; illustrated. An outstanding feature of this system is that it permits a central greasing station either underground or on top where the cars may be greased in trips as they pass the greasing machine.

**K and K Flotation Machine.** Southwest Engineering Co., Los Angeles, Calif. Catalog D. Pp. 36; 7 x 10 in.; illustrated. The special features of this machine are described and pictures of it in operation are shown.

**Hyatt Roller Bearings for Conveyors.** Hyatt Roller Bearing Co., Newark, N. J. Bulletin No. 1015. Pp. 23; 8 x 11 in.; illustrated. Describes the part these bearings have and will play, when properly selected and assembled, in reducing to a minimum the operating expenses of a conveying system.

**Electric Elevator Control Equipment.** The Cutler-Hammer Mfg. Co., Milwaukee, Wis. Publication 2082. Pp. 48; 8 x 11 in.; illustrated. Different types of elevator control apparatus for passenger and freight elevators are described.

**American H. S. Fans.** American Blower Co., Detroit, Mich. Bulletin No. 1103. Pp. 35; 8 x 11 in.; illustrated. Some of the distinguishing features of these fans which are described include the streamlike design of air entering orifices or blower inlets; the impellers or wheels are designed so as to keep a uniform velocity of air through the wheel, thereby reducing wheel loss; two single-inlet impellers or wheels to each blower of the double inlet type; specially designed scroll or casing with expanding outlet, so proportioned as to afford maximum recovery from velocity pressure to static pressure with the least amount of turbulence. Curves, specification sheets and tables are included.



## Traffic

### B. & O. Assails Indiana's Low Intrastate Rates

Copies of the complaint by the Baltimore & Ohio R.R. and other steam roads operating in Indiana, against the Indiana Public Service Commission's reduced schedule of intrastate coal rates now effective in that state, which has been filed before the Interstate Commerce Commission, have been received by Governor Branch of Indiana and the Indiana commission. The roads charge in their new attack on rate schedules on coal, which they failed to displace by court appeals, that the rates cause undue discrimination against interstate commerce. An investigation has been ordered by the Interstate Commerce Commission and it is expected that a date will be fixed in December for a hearing by an examiner, probably in Indianapolis. The Indiana Public Service Commission, as principal defendant, will work for the dismissal of the new case filed by the roads.

### Freight Rate on Coal Reduced In Clarksburg District

The West Virginia Public Service Commission has issued an order reducing the freight rate on coal in the Clarksburg and first freight zone of West Virginia, effective Dec. 1. This is the second reduction within the last two years. Directly the new rate applies to the Baltimore & Ohio, Pennsylvania, Monongahela and Western Maryland railroads, but other railroads in the state are affected indirectly as well.

The case was known as No. 1,307 on the docket of the commission and was brought before the commission on the petition of the Domestic Coke Co., of Fairmont, to investigate and determine the reasonableness of rates now in effect on the transportation of all kinds and classes of freight, including coal and coke, by carriers on steam railroads between points within the state on short hauls. Under the ruling of the commission all the railroads above enumerated are required to put into effect on Dec. 1 a rate not to exceed 55c. per net ton on coal transported from mine or point within the first zone to another point within that zone. The Baltimore & Ohio is required to put into effect a rate not to exceed 42c. per net ton on coal transported within the Clarksburg district and the same road also is required to put into effect a coking-in-transit rate not to exceed 40c. per net ton within the first zone.

## Industrial Notes

The Newark Wire Cloth Co., Newark, N. J., has established a new branch office in the New England States at 66 Hamilton St., Cambridge, Mass., with John G. Loring in charge. A new factory of over 30,000 sq. ft. ground area has just been completed on Verona Avenue in Newark.

The Conveyors Corporation of America, 326 West Madison Street, Chicago, announces the appointment of W. P. MacKenzie Co., 1234 Callowhill Street, Philadelphia, as its sales representatives in southeastern Pennsylvania and southern

New Jersey. This organization will handle the sale of steam jet ash conveyors, cast-iron storage tanks, airtight doors for ash-pits and boiler settings, and other specialties. Associated with W. P. MacKenzie in the sales organization are John Beard, J. E. Fulweiler, S. T. MacKenzie and W. R. Lunn.

## New Companies

The Dozier-Diamond Coal Co. has been incorporated in Madisonville, Ky., with a capital stock of \$20,000, by W. B. Dozier, Jesse Diamond and E. W. Dozier. Jesse Diamond previously was moving spirit in the Southern Gem Coal Co. in Illinois, now defunct.

The Gregory Branch Coal Co. has been incorporated in Grays, Ky., with a capital stock of \$50,000, by J. T. Gray, H. E. Hubbard and others.

The Elliott & Day Coal Co. has been incorporated in Pikeville, Ky., with a capital stock of \$10,000, by W. K. Elliott, P. W. Day and others.

W. R. J. Zimmerman, of Charleston, W. Va., well known in the coal business, has just launched a new company to be known as the Zimmerman Coal Co. Associated with him in the new concern are: R. S. Spillman, F. L. Thomas, H. H. Corri and H. D. Battle, all of Charleston. The company has an authorized capital stock of \$50,000.

A charter has been issued by the Secretary of State of West Virginia to the Beury Brothers Coal Co., capitalized at \$100,000. T. C. Beury, John A. Thayer, Beverly Broun, Edward Hart and George R. Bullock are the incorporators. The property to be operated is a part of the old Beury lease near Echo, W. Va., and is said to contain a large amount of good coal.

A state charter was issued recently at Harrisburg, Pa., to the Clift Coal Co., of Wilkes-Barre, the purpose of which is mining, shipping, selling, purchasing, leasing and dealing in coal. The capital stock of the company is \$500,000 and the incorporators are W. O. Washburn, 51 North River Street, Wilkes-Barre, treasurer; Charles E. Clift and W. J. Fowler, Wyoming.

## Association Activities

At the third semi-annual meeting of the Moshannon Coal Mining Institute held in Philipsburg, Pa., late in October, President Thomas A. Mather presented an interesting program of talks on mining problems. H. I. Smith, of the U. S. Bureau of Mines, gave a highly interesting discussion on the subject of leasing of government coal lands. Officers were elected as follows: President, R. H. George, Winburne; vice presidents, W. A. Gould, Philipsburg; Albin Lindberg, Allport, and Thomas A. Mather, Tyrone; secretary-treasurer, Thomas F. Morgan, Philipsburg; assistant secretary-treasurer, William George, Philipsburg; executive board, Summerville Eastment, Philipsburg; Thomas Gallagher, Houtzdale; Joseph Knapper, Philipsburg; H. McD. Lorain, Philipsburg, and James Marshall, Houtzdale. There were 133 members and guests present.

## Coming Meetings

Illinois Mining Institute. Annual meeting, Nov. 22, Elks Building, Springfield, Ill. Secretary, Martin Bolt, Springfield, Ill.

American Society of Mechanical Engineers. Annual meeting, Dec. 1-4, Engineering Societies Building, 29 West 39th St., New York City. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

West Virginia Coal Mining Institute. Annual meeting, Dec. 2-3, Welch, W. Va. Secretary, R. E. Sherwood, Charleston, W. Va.

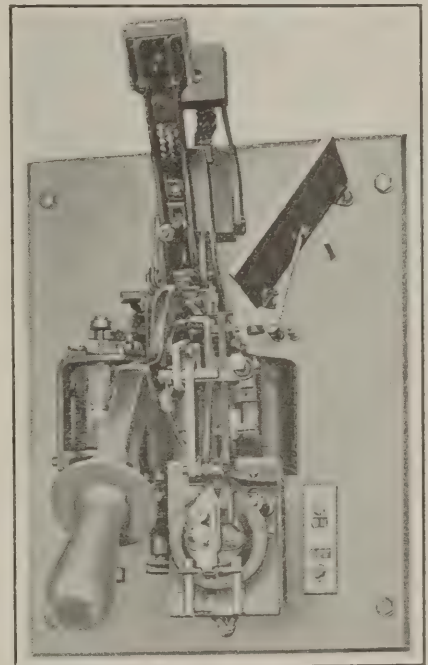
Coal Mining Institute of America. Annual meeting, Dec. 3-5, Chamber of Commerce Bldg., Pittsburgh, Pa. Secretary, H. D. Mason, Jr., Box 604, Ebensburg, Pa.

West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers. Fourth annual convention, Dec. 12 and 13, Huntington, W. Va. Secretary-Treasurer, Herbert Smith, Huntington, W. Va.

## New Equipment

### Automatic Reclosing Breaker Operated Manually

Automatic reclosing circuit breakers have long since emerged from the class of new devices. In certain fields, notably in coal mines and electric railways, they have an established place as one of the devices essential to efficient operation. In other fields and in industrial plants generally, were interruptions due to overloads and short circuits are not so frequent, automatic



### Reclosed Automatically or Manually

Should this breaker fail to function because something has gone wrong with the automatic reclosing control features it may easily be operated manually.

reclosing circuit breakers have not been so generally adopted. The reason for this probably has been that the advantage of the automatic reclosing feature has not been sufficiently apparent to offset the thought that an automatic reclosing circuit breaker is more complicated than a manually operated breaker. Also, no doubt, there has been considerable hesitancy in the past in applying automatic reclosing breakers to important feeders in mills and industrial plants because of some doubt as to what should be done in the event that the circuit breaker failed to operate automatically.

In order to overcome these objections and obstacles to the more extended use of automatic reclosing breakers, The Automatic Reclosing Circuit Breaker Co., of Columbus, Ohio, has recently developed a circuit breaker which normally is full automatic in its operation but it may at any time be operated in the same manner as a manually operated breaker.

When operating as an automatic re-



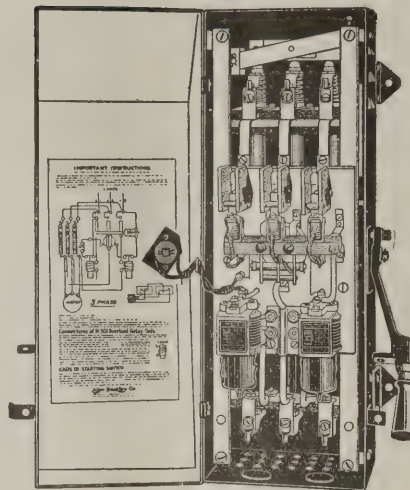
closing circuit breaker, it is under the control of a double-pole push button switch. When this switch is in the "off" position, all of the control circuits of the breaker are completely disconnected and the breaker remains open. When the switch is in the "on" position, the control circuits of the breaker are connected and the breaker closes, provided conditions on the line are proper for it to do so. On overload, it opens automatically, remains open a short time interval regardless of load conditions, and at the expiration of the predetermined period recloses, providing the overload or short circuit which caused it to open has been removed.

When for any reason whatever it is desired to operate the circuit breaker manually, the control switch is thrown in the "off" position and the operating handle attached to the breaker. The breaker is then closed in the usual manner by depressing the handle. It will open on overload or voltage failure if provided with no-voltage release. The operating handle is removed when the breaker is again placed in automatic operation.

Thus refinements of automatic control are attained, coupled with assurance of high-grade circuit breaker protection at all times and under all conditions. At the present time, breakers of this type are available in capacities up to and including 2,000 amp.

### Semi-Automatic Starter

A new and improved resistance starter for squirrel-cage motors up to 30 hp., 220 volts and 50 hp., 440 to 550 volts has lately been brought out by



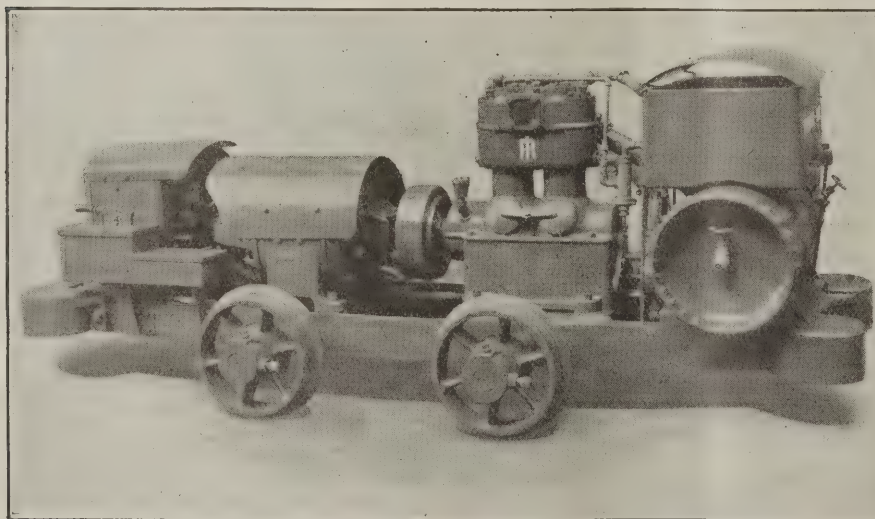
**Stepless Motor Starter**

Smooth starting characteristics are obtained by compression of graphite resistor disks. The motor is thrown across the line without breaking the starting circuit.

the Allen-Bradley Co., Milwaukee. Stepless acceleration and smooth increase in starting torque without excessive starting current is provided by using the well-known graphite compression resistors which provide a starting cycle smoother than is obtained with any form of transformer compensator. The motor is started by lifting the starting handle quickly to the mid position. From that point the handle is slowly lifted and the magnetic switch closes, thus throwing the motor on the line without opening the motor circuit. Arc shields and blow-outs are provided in all phases.

### Well-Balanced Air Compressor Mounted on Mine Car

A marked advance in portable equipment for underground mining, and one in which coal-mine operators, particularly, are showing considerable interest, has been made in the newly designed Type 20 mine-car air compressor recently placed on the market by the Ingersoll-Rand Co.



### Plenty of Air Must Be Available If Work Is To Be Done Promptly

Pressure losses and delays caused by long pipe lines are obviated by setting-up the compressor near where hammers and drills are used. A short wheelbase truck is always essential on such equipment so that it can turn short curves. However, the compressor and drive must be well balanced to prevent vibrations.

speed and of greater capacity. Furthermore, they required less floor space; and a simple foundation sufficed to assure their alignment.

With a gradual improvement of the air compressor, its value to industry increased; and it was inevitable that there should arise a demand for a portable machine—one that could be moved easily and quickly from place to place and that would always be ready for service. The usefulness of compressors of this type need not be elaborated here.

Portable mine-car compressors are nothing new; but, appreciating the exacting nature of the work, the company in question set itself the task of carefully studying the conditions under which machines of this sort have to operate and then of designing equipment that would best meet those requirements. The new Type 20, electrically driven, mine-car air compressor is the result.

The compressor is of the vertical, duplex type. Its natural tendency to vibrate is along the vertical plane, and this has been counteracted by centering the compressor over one of the axles—giving it, in effect, a solid foundation. The electric motor, which is of extra-heavy construction and built to resist vibration, is connected to the compressor by means of a quickly detachable coupling. The whole equipment is mounted on a rigid, cast-steel frame, to the underside of which are attached mine-car wheels on short centers to permit taking sharp curves.

This self-contained mine-car compressor is being manufactured in three sizes, namely: 91, 160, and 230 cu.ft. per minute piston displacement.

### New Plymouth Gasoline Locomotive

The Fate-Root-Heath Co., formerly the Plymouth Locomotive Works, Plymouth, Ohio, has just brought out a new gasoline locomotive. It weighs eight tons and is equipped with a Climax four-cylinder engine developing 85 hp. at 900 r.p.m. Bosch high-tension magneto with impulse couplings, Simms 12-volt starter, Willard storage battery, Stromberg carburetor, United air cleaner and built-in governor.

Cooling is by a means of a Modine sectional-core radiator and a 22-in. gear-driven fan. The radiator is protected by a heavy guard. The power transmission is the well-known sliding-gear type providing four speeds forward and one reverse.

Axles are of alloy steel, heat treated and of extra large diameter. Wheels are rolled steel, 24 in. in diameter. Brakes are of the lever type to all four wheels and sand is applied by hand to all four wheels.

This locomotive is built with a high cab, the height over all being 84 in., enabling the operator to see over industrial cars. The cab is provided with a side entrance with sliding steel doors, avoiding the danger from exit between the locomotive and car, as in the case of rear-opening types.

The operating speeds are 2½, 4, 8, and 12 miles per hour, with an engine speed of 900 r.p.m. The drawbar pull at 2½ m.p.h. with sand is 6,000 lb.



# COAL AGE

McGraw-Hill Company, Inc.  
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R. Dawson Hall  
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## Eliminating the Janitor

**F**OREMOST among the reasons advanced for the use of oil in place of coal for domestic purposes is that the janitor is eliminated, whereas with coal it is difficult to dispense with him, the ash being in a cellar below the street level and the ashes having to be carried up to the sidewalk.

However, that difficulty would be greatly reduced if the quantity of ash were lessened by the better cleaning of coal. Ash cans of decreased height and weight might be used such as the householder, though an office man, could readily handle. In this way the cost of warming a dwelling house would be reduced about \$60 a year.

Ash in domestic coal furnishes a difficult problem to the householder. What he spends in removing it, if he hires a janitor, would enable him to buy about four tons more coal, though some householders are able to solve the problem by hiring men whose sole duty it is to carry the cans from the cellar and place them on the street or by bribing the city ash men to enter the cellar and remove the cans, contrary in most cases to the city ordinance. If the anthracite man would oust oil he can do it no better than by reducing the ash content of his product.

## All Ways Are Clear

**A**S THE result of the election the whole nation breathes more freely. The Republican and Democratic candidates for President were both men of high ideals, of excellent record and noble purpose. Of the other important candidate, La Follette, we are not disposed to speak with disfavor, but he was endeavoring to obtain office by advocating principles which would have been highly detrimental to the nation's well being and progress.

La Follette would have the railroads and coal mines operated by National commissions though every question that would confront such administrative bodies would be a political issue. The commissioners would ask: What action would menace the life of the commission? What decision would alienate the voter? Expedient political action would be the test of every question. Economy would not live long in such an atmosphere. Every problem would be solved by considerations of the moment rather than by larger questions of economical operation. As a result the industries operated by government would be inflated. Uneconomical plants would continue to be operated. Necessarily unprofitable roads would be built and maintained, and the effort of every congressman would be expended in getting favors for his own section.

We all remember how repair docks were kept in operation and extended when they could be reached no

longer by naval vessels of the size which needed repair. We know how post-offices were constructed not on the basis of population and post-office needs but in response to clamor and to make certain congressmen "solid" with their constituencies. We know how even during the war decisions sometimes were made to satisfy certain voting necessities, at places that no manufacturer would choose for such enterprises.

But these facts, though they must not be forgotten, do not now menace us. We have for four, and we believe for many, years the promise of a clear way before us in which we shall be able to direct our attention to development and progress. Industry is free once more to advance, and the sentiment is abroad that we are going to have better times, less unemployment, less uncertainty and greater rewards for all who serve the public by their activity and labor. The farmer, whose sound judgment was, for a moment, questioned, has proved to be no supporter of La Follette, nationalization, syndicalism or socialism. The public has rendered a verdict that this country is safest under constitutional rule and under a system of government which protects the weak without hobbling the strong. The prospects are brighter than were for a while expected. For this we are grateful, the more that for a time the nation had to endure an extremely inclement political atmosphere.

## Near and Far

**I**F NEWSPAPER statements are to be believed the President is going to favor railroad tariffs giving lower rates per mile to the farmers located in places distant from points of consumption, thus depriving those that are near the market of their natural advantage. The duty of providing the railroads with an adequate income is to be shouldered by those shipping less bulky products. This will arouse much opposition and may never get beyond the point of discussion.

The interest of the coal trade in this action is obvious. The high-volatile coals, having been deprived of their natural market by freight rates based on equality in transportation charges, or rather on a supposed equality in competition, instead of on distance of transportation, have been anxious to have these rates revised. It naturally will be conceded that if farm rates, which have been quite largely based on distance are now to be based on competitive equality, coal rates that have been largely based on the latter plan will hardly be revised so as to return to the former. The Interstate Commerce Commission or Congress can hardly be so inconsistent, at least in making new decisions.

Thus the battle rages, with victory seemingly veering toward those who have been led by circumstance and preference to locate in the more remote regions. As far as farming is concerned we cannot see why any



dispensation should be given to those who inhabit the rich valleys of Utah. It has never been claimed hitherto that the agriculturists around Salt Lake City needed government help and favor.

### Put the Price Too High

MUCH of the trouble with coal has been that its price has been put too high. The Coal Trust, which is a labor and not a capital trust, has made the mistake that trusts too often make. They believe they can set the price where they will, and then they place it higher than the traffic will bear.

The anthracite-miner trust has lost some business by that fact. Oil and coke have made inroads, because the anthracite wage scale was unduly boosted and prices became excessively high. In the union bituminous mines the same mistake was made, but in that case the effect on the labor trust was worse, because the consumer in many cases could buy from non-union mines.

Labor trusts can easily put the price too high. They should remember that the railroads when they held unrestrained power were disposed to ask no more than would keep business coming to their roads. They called it charging "all that the traffic would bear." They were excoriated for it, but the wrong they did was less heinous and less self-destructive than charging more than the traffic will bear. Self-advantage and responsibility to the public combine to condemn any such action.

### The Dollar Mark

MANY DOLLARS there be that will neither ring nor resist the pressure of the teeth. We cannot measure everything in dollars. For instance, what is gained at conventions and institutes cannot always be written down in hard currency, but unfortunately the cost of the trip may be so evaluated. We can write the expenditure down in serried figures. In fact most of these costs are so written, and sometimes the time cost is also thus estimated. Therein lies the danger. The rewards are intangible; but the money paid for them is so readily measured.

But if we look back into history, we shall find that the ages when men traveled, when the brightest minds met, were ages of progress and the times when men stayed at home and relied on their own unaided wisdom were days of retrogression. It is true many great men have come from closely isolated territories, but so long as they stayed closed in by mountains, desert plains, ill-constructed roads or tempestuous seas they showed the evil effects of isolation.

The convention habit is going to be one of the quickeners of civilization. Those who avoid it will still follow their several narrowed ways, full of prejudice and lacking in purpose. The convention stimulates thought, lays in fact a premium on it, gives a driving force to life. The mental muscles are stimulated by it. Functions sterile for lack of use are pricked into life, at the expense, it is true, of time, of railroad fare and hotel charges, but who shall say the cost is greater than the profit, the outlay greater than that which is laid by.

The Coal Mining Institute of America, the most numerous attended of our coal-mine meetings, meets this year with a good program, not least of all its prolific question box, which if it misses fire occasionally

always brings up much of sterling value. The papers on haulage by belt, on recent electrical development and on rock dusting will be delivered by the most competent of men. They will give those attending the meeting a new "slant" on mine operation and safety, and even better yet they will promote thought and study.

They will have ramifications in the mining industry that will be difficult to trace back, for progress in one direction gives to an active mind power to develop in other ways. No sooner is one science accelerated than all move forward together. We trust that the Coal Mining Institute of America will be well attended and that the habit of gaging the dollar by mere physical tests will be, at least temporarily, abandoned, for the difference in the quality of mind between the employer and employee rests largely in this matter of mental contacts.

### Who Excuses Himself Is His Own Condemner

OF ALL FRENCH proverbs none is perhaps more apt than *Qui s'excuse s'accuse*, which may be translated "He who excuses himself is his own accuser." The best manner of meeting a possible accusation is by establishing a good reputation and doing it before the charge is brought. Then when the public hears unfavorable comment it has its mind already made up and meets the accusation with the words: "It cannot be true or if it should be true there are extenuating circumstances. Let us wait to hear the whole matter. You will see then what you shall see."

The very worst time to answer a charge is when the charge is made. The public accepts what it hears first, and to dislodge a formed prejudice is many times as hard as to put an idea in an unprejudiced mind. That is the trouble with the coal industry and with the coal companies individually. The industry and the companies go along silently, always "out" to callers, always silent as to their good deeds, always unwilling to give information as to their progress—and then a charge comes. The industry or the company is arraigned; it has been callous as to the rights and comforts of its employees, it has been ill-disposed to progress and the charge is unanswerable, not because there is no defense but because the judge, the public, is too lazy or too prejudiced to listen. The brain cells of the hearer have already grouped themselves and the reply is "You will have to show me."

We have in mind some corporations, incensed at criticism and rightly so, which, nevertheless, keep their lights under an impenetrable bushel. Will their good deeds serve them? We think not. We recall on the other hand two manufacturers who gave the press good opportunity to learn about their humanitarian work, their *bonhomie*, their aggressive methods in promoting safety and economy. Later came ominous charges against one of them, frequently repeated, but the public would not hear them. The people even gloried in their profits. The manufacturer thus bitterly attacked made no defense. He did not need to do so. The good he had done, which the public knew and recognized, carried conviction with it. One of the railroad companies attained a similar repute and not only did it save its reputation but it gave its president such a standing that no matter what was said—and much indeed was said against him—he continued in public favor and still retains much of it.



# H. S. Gay Long Ago Tried Out "Modified Longwall"

His 1905 Efforts at Full Retreating Longwall Failed Because of Uncontrollable Roof But Rib-Slabbing in Rooms 300 x 80 Ft. Was Safer and Raised Output to 9.2 Tons a Day per Inside Employee

BY ALPHONSE F. BROSKY

Assistant Editor, *Coal Age*  
Pittsburgh, Pa.

ALTHOUGH many coal-mining men still scoff at those who ponder the possibilities of converting room-and-pillar mines to modified longwall methods, it is a fact that the ranks of the longwall thinkers are thickening. Longwall mining in one modified form or another has been adopted in many an American mine, following trails blazed by such men as Harry S. Gay, Sr. So his longwall experiments of 20 years ago are coming to have a new interest for coal men of today.

As early as 1905, in Logan County of West Virginia, Mr. Gay, then an active mining engineer but now a resident of Baltimore, Md., began his trail blazing. He wrote at the time: "Not having the vision of a prophet, I determined on the first suitable opportunity to try some system of modified longwall." After following his profession for a number of years in the anthracite field of Pennsylvania, in 1904 he had moved to

Logan, W. Va., where he opened up the Gay mine of the Gay Coal & Coke Co. The following year he started an experiment that was destined to modify longwall mining so as to meet the conditions imposed by the market and the particular seam to be worked and to make it less costly than room-and-pillar work.

The Gay mine was opened up in a tract of the Cedar Grove seam (known as the Island Creek seam in Logan County), lying 200 ft. above the level of the Guyan River and dipping southwesterly about  $1\frac{1}{2}$  per cent. In this tract the average thickness of the seam is 67 in. The coal in the old sections of the mine where the early experiments were made is free of partings. Above it the cover attains a maximum thickness of about 1,000 ft., the average being about 500 ft.

## ROOF WAS SOUND BUT DIFFICULT TO CONTROL

When the experiments were first started, the field being new, little was known about the character of the roof except that it was apparently sound. The few previous experiments in applying a longwall system in mining West Virginia seams were without success because the action of the roof could not be controlled. Realizing this difficulty, portable posts were designed by Mr. Gay to support the roof near the face of the workings and to obviate the immense supply of timbers which his experiments otherwise would have required. Details of this type of post, save that it was mounted on a heavy hydraulic head, and supported a heavy roof

load, are of no immediate importance because its use was discontinued long ago.

It was proposed to mine by a longwall retreating system the block of coal given to the first experiment. Accordingly, the section shown in Fig. 1 was developed by the two longitudinal sets of entries, Nos. 4 and 5, and the No. 2 transverse set of entries, which laid off a block 300 ft. wide and 600 ft. long. The aircourses and haulage entries were driven 10 ft. wide and were separated by a pillar 60 ft. wide.

As the retreating wall moved away from No. 2 entry, the span of roof left behind did not break freely, but tended to act as a cantilever over the face of the coal. After this wall had retreated more than 30 ft., rows of props on 15-ft. centers were set at 8- to 10-ft. intervals. Later, when the roof span became so wide that the props did not seem to support the roof adequately near the

face, the portable posts were brought into use. The first row of portable posts was placed on 6-ft. centers and 11 ft. from the face, when the wall had retreated 60 ft. from the starting line. Following the next retreat of 6 ft., the depth of a cut, a second row of portable posts was set 3 ft. in advance of the first row. Thereafter, with each retreat equivalent to the depth of one cut, the last row of portable posts was safely moved one at a time to an advanced position.

The retreating wall was cut by an electric cutting machine of the longwall type. This particular machine was replaced some months later by a modern chain machine that undercut as much as 500 tons of coal in  $8\frac{1}{2}$  hr. Shot holes were drilled, 6 ft. deep on 10-ft. centers, with an electric drill, by the use of which two men were enabled to drill and shoot the entire 300-ft. face in 10 hr.

As indicated by the arrows in Fig. 1, the mine cars passed by the face in one direction following the dip from No. 5 entry to No. 4 entry. Under this system, each day one mule could deliver 100 tons of coal from the working face to a side track located about 1,000 ft. away. On the completion of each successive cut the entry track was shortened and the room track was shifted 6 ft. toward the face. Details of the arrangement of the track and roof supports with respect to the face are exhibited in Fig. 2.

No particular difficulty was met in the work, which proceeded as already described, until the wall had re-

## HERE WAS VISION

OVER sixteen years ago Harry S. Gay, Sr., dreamed of loading machines and other means to help perform the work of mining coal. Earlier than that he made use of cutting machines of the chain type and an electric drill. Some of these machines are common now but even today electric drills are used in only a few mines, partly because of union labor's demand for the lion's share of the saving. Experiments in modified longwall systems are being tried in some mines today, of a character not unlike those tried nearly twenty years ago by Mr. Gay.



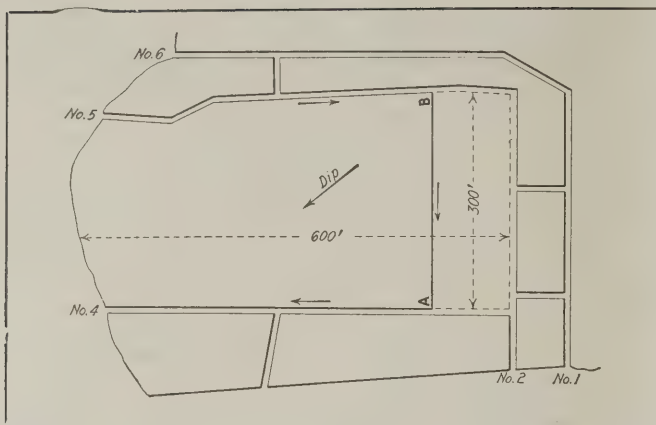


Fig. 1—Full Retreating Longwall Wouldn't Work Here

An attempt to mine the face A B by this type of longwall method failed because the roof failed to cave as promptly as desired. It was realized that the area of roof unsupported was so great that life would be endangered should any more coal be taken out in that area.

treated a distance of 100 ft. Up to this point in the experiment the roof manifested no tendency to break. It was decided, therefore, to meet the conditions which sometime or other—the sooner the better—would have to be confronted.

So, the track was shifted close to the face, 6 ft. from which 100 portable posts in a single row were set. Then 18 holes were drilled in the roof to a depth of 6 ft. in a line 10 ft. from the posts and charged with dynamite. Twenty of the largest props (not portable posts) were drilled and charged with dynamite for the purpose of lessening the resistance to a fall of roof behind the "breaker row." These charges were fired by hand in quick succession.

A period of waiting followed, in which the roof forces were allowed to spend themselves. An examination revealed the dislodgment of a block of roof having a length of about 100 ft. that had sheared close to the posts on one side and near the opposite rib on the other. The space left by the fall disclosed a bed of strong sand slate without a parting in a thickness of 30 ft. Thus

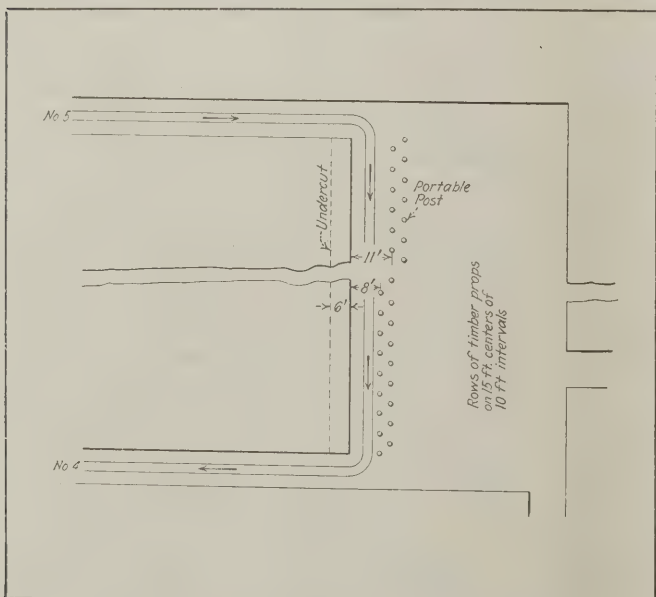


Fig. 2—Provisions Made to Assure Safety

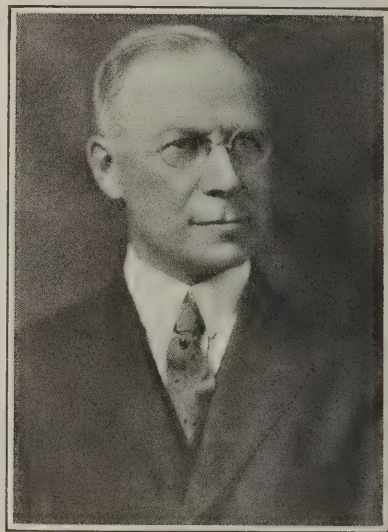
This scheme was tried when the roof failed to fall as anticipated. The distance between the closest row of posts and the face of the coal was 8 ft. After the face was cut the unsupported roof span was increased to 14 ft. When falls were expected the posts were placed closer to the face.

the examination foretold the difficulties that were to be expected in prosecuting a true longwall system in this seam of coal. Along another portion of the working place the slate broke over the posts and lightly buried 50 ft. of the track. The remaining length—150 ft.—of the roof was undisturbed.

Blasting of the roof reduced the daily tonnage from the face about one-half. The work was continued along the lines described for a period of six weeks following the first fall of roof, during which time it became evident that the method could not be continued with inexperienced labor under the conditions met. A fear was constantly entertained that a mass of rock might break over the posts and endanger the lives of the workmen. At this stage, the experiment was discontinued.

Though Mr. Gay was forced to admit defeat in the pursuance of a system of full retreating longwall mining, because the roof was not stratified sufficiently to break behind the posts, he planned a modification of that system which would retain many of its advantages.

In his first experiment he demonstrated to his own satisfaction that even under the most adverse conditions that he met, the cost of mining was less than that of the room-and-pillar system. Among other factors, the saving was attributed to the



Harry S. Gay, Sr.

Who opened the Gay mine of the Gay Coal & Coke Co. at Logan, W. Va., where he conducted many interesting experiments in longwall mining.

facility with which coal could be moved, the concentration of labor—and that of the less skilled kind—and the simplicity of the ventilation. In a paper describing his early experiments before the Coal Mining Institute of America, Dec. 19, 1906, Mr. Gay gives in the two following paragraphs his conditions and assumptions for his second plan of mining:

"Any method that might be adopted, other than those in vogue in this locality, would have to comply with several conditions: (1) The percentage of coal won must equal on an average that of the other mines in the same coal field. (2) Since all the coal could not be removed by a single operation, pillars of some sort were a natural consequence; therefore, sufficient pillars must be left to sustain the roof for a period of time that would allow each section to be mined in safety. (3) The proportion of narrow to wide work must be such that the additional cost of the former would be absorbed by the decreased cost of the latter.

"The dimensions adopted, which satisfied the three conditions, were based on the following assumptions: (1) Since it was already demonstrated that the roof was self-supporting in a span of 120 ft., it might with perfect safety be worked in a span of 80 ft. (2) If a seam of coal will support 5,000 ft. or more of overlying strata, one-half the coal may therefore sustain 2,500 ft.



of strata, and likewise one-fourth of the coal may sustain 1,250 ft. of strata. Thus 30-ft. pillars, with regular intervening spaces of 80 to 90 ft. between them, might for a time sustain the weight of 1,000 ft. of strata."

The working face in the second experiment was of the same length as that of the first experiment, and was mined in identically the same manner except that pillars were left standing at given intervals behind the retreating block of coal to hold the roof behind the working face. The scheme was thus resolved into a combination of room-and-pillar and longwall mining methods.

Rooms 10 ft. wide on 110-ft. centers were driven transversely into the block of coal, and then widened out to a width of 80 ft., one at a time, in the retreat by slabbing. This left a 30-ft. pillar between each worked-out room. These rooms in reality were sub-entries while the slab cuts differ in no way from those made in the retreating longwall of the first experiment. This layout is shown in Fig. 3.

Trouble with the roof was encountered only near

These rooms were mined in the retreat commencing with No. 12 room which was mined out to a width of 40 ft. before a row of ordinary timber props, of 8- to 10-in. diameter on 15-ft. centers was set as close to the face as the work would permit. When this room attained a width of 50 ft., another row of timber props was set. Thereafter, for each increase of 10 ft. in the width of the room, a row of the portable posts on 10-ft. centers was set and moved ahead as required. The same procedure was followed in working the remaining rooms, one at a time. The action of the roof was manifested to an extent by its effect on the timber props.

As a room approached its maximum width the likelihood of a break in the roof and its inherent dangers increased in proportion; and, therefore, as the room was widened out, greater care in the work and more supervision were required. No subsidence was noted in any of the seven rooms except in No. 12 room, in which the manifestation was only slightly perceptible. The maximum thickness of cover over these rooms was 300 ft.

It was found that 26 men could mine as much as 300

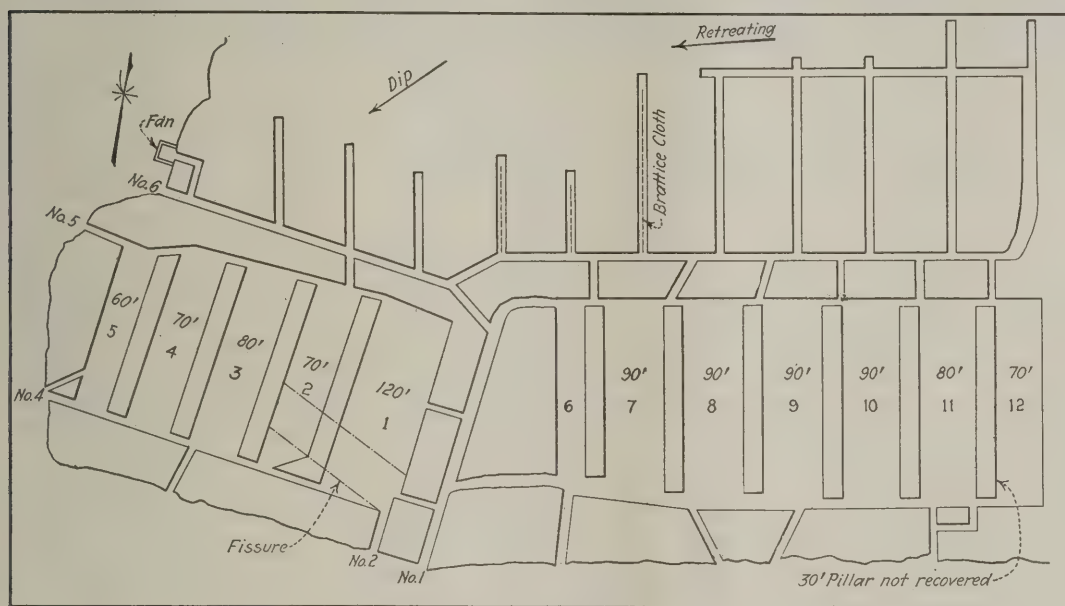


FIG. 3

### Room Slabbing

When the roof hung stubbornly in long spans behind the longwall working face of Fig. 2, 10-ft. places on 110- or 120-ft. centers were driven and the intervening pillars were slabbed, forming 90-ft. rooms, leaving a 30-ft. pillar to hold the roof.

the outcrop, where the rooms were driven as narrow as 60 ft. and auxiliary props were set close to the working face to hold up loose fragments of slate. As a consequence, the details of this plan were believed to meet the requirements of a hypothetical successful system.

At all times the labor worked on solid coal while the pillars left standing and abandoned in the retreat served to stop any general squeeze from spreading any further than the worked-out territory. One objection to the plan was the driving of single narrow rooms into a block of solid coal for a distance of 300 ft., necessitating the hanging of brattice cloth for ventilation in the room being driven.

Freedom from roof trouble under normal conditions in mining out rooms 80 ft. wide led to the belief that the latter could be slabbed to a width of 90 ft., leaving the usual 30-ft. pillar between them. With this object in mind No. 4 and No. 5 entries were driven eastward from No. 1 entry to the boundary line. This development opened up a small panel into which sub-entries were driven from two ends on 120-ft. centers for the widening out of rooms Nos. 6 to 12 inclusive, as may be seen from Fig. 3.

tons per day from one room, and that 12 men could yield an additional 60 tons per day in driving the entries required to maintain adequate development for a uniform output from a room. A total of 39 men mined 360 tons per day, or an average output in the section per inside man per day of 9.2 tons. The average output per man was slightly more or less depending upon the conditions met in mining. At that time in the best of the mines of West Virginia and Pennsylvania using the room-and-pillar system, the average daily output per inside man seldom exceeded 5 tons.

To produce 360 tons from a section, of which 300 tons came from a room and 60 tons from the development of entries, the labor of 39 men was divided as follows:

One Room	Entries
1 Foreman	6 Loaders
2 Machine men	2 Machine men
2 Shotfirers	2 Mule drivers
4 Bottom-scrapers	2 Tracklayers
12 Loaders	
4 Mule drivers	
1 Tracklayer	
1 Timber man	





**Tipple of the Gay Mine as It Appears Today**

On the right can be seen the valley of the Guyan River. The coal (the Island Creek or Cedar Grove) lies high up in the hills 200 ft. above water level among the marvelous woods that have made West Virginia in the matter of scenery one of the most fortunate states in the Union. Each day about 400 tons of slack is dumped on the storage pile and an equal quantity is hauled to a power plant nearby on the right.

Of great interest is a comparison of the results obtained in mining by the true longwall system, described as the first experiment, with those obtained in mining by the system of modified longwall in rooms. A study of the two systems while they were being tried showed that the former yielded a daily tonnage per inside employee 20 per cent higher than did the latter. Had the true longwall system worked successfully it would have permitted close to a 100-per-cent recovery in the Gay mine as against 80 per cent by the modified system. But from the standpoint of safety the modified system showed a decided advantage and, as a consequence, required the services of only a few skilled men.

It is interesting to know that Mr. Gay had an early

dream of mechanical mining. In 1906, before the Coal Mining Institute of America, he remarked, "A mechanical loader is not an impossibility, and the day may come, in some mines, when every division of the work will be performed or greatly assisted by mechanical means, and 10 tons per inside employee will be a regular and steady production."

In a later issue of *Coal Age* an article will appear which describes further modifications of the systems delineated in this article, including the system now being used in the Gay mine. Mr. Gay has tried a number of loading machines, and is now using two with great success. The coming article will deal also with mechanical loading.



**Good Coal Camps Sometimes Have Good Schools**

Here is the new public school at the model coal town of Hiawatha, owned by the United States Fuel Co., in Utah. Twelve teachers are employed using the most modern methods and school equipment to be found in any city educational system. A handsome and comfortable dormitory for teachers, not shown in this picture, helps make life in Hiawatha attractive for these women.



# Mine Locomotives, Their Operation and Control

Why Cable Reels Should Not Be Driven by Locomotive Axles —  
Should Gathering Locomotives Run Fast or Slow? — Difficulties  
with Series-Parallel Controllers—Limitations of Rotary Converters

By F. L. STONE

Industrial Engineering Department, General Electric Co.,  
Schenectady, N. Y.

**F**IRST among the achievements in the use of electricity for the reduction of mining costs was the installation of electric mine locomotives. Long before power companies thought of supplying current to the mines, electric locomotives were busy underground hauling loaded cars from the working face and returning empties. Their power supply usually consisted of small direct-connected engine-driven generator units in sizes up to 300 kw. To compensate for excessive line drop the generators were usually heavily over-compounded.

In this manner the early operators hoped to reduce their expenditure for copper wire. Later experience, however, seems to indicate that it is better practice to maintain as high a voltage as practicable at the substations and make a moderate investment in copper, thereby keeping the voltage up and the energy loss down.

The scheme of wiring and underground transmission varies considerably with local conditions. Sometimes cables are run down the main shaft; in other instances a borehole is put down as close as possible to the center of distribution and a feeder cable dropped through the borehole. Usually, various parts of the mine wiring are sectionalized so that power may be cut off in any part of the mine desired. Since the early days the small engine-driven generators have been dispensed with, and modern substations installed.

The design of the locomotive has changed materially as conditions surrounding its operation have become more thoroughly understood by designing engineers. Mine locomotives may be divided into two general classes, namely: the main-line haulage locomotives and the gathering locomotives; the former, as their name indicates, haul long strings of cars from various central points where the trips are made up.

The gathering locomotive differs from the main-line locomotive in that it is usually lighter, is of shorter wheel base and carries with it a cable reel. The size of the gathering locomotives ordinarily used varies from 3 to 8 tons. The cable reel is usually driven by a torque motor which when the reel is in action is left across the line permanently and thus a continuous torque is exerted on the reel.

One end of the cable is electrically connected to the trolley or other source of power, and when a locomotive enters a room the cable reel is unwound against the torque of the motor. The torque developed by the motor is sufficient to reel up the cable as the locomotive comes out of the room.

Cable reels are built in two distinct forms, one a comparatively long drum of small diameter placed at

one end of the locomotive and the other a large diameter drum with a narrow face, placed on top of the locomotive with its axis vertical. The first requires a mechanical guide to insure the proper coiling of the cable. The short-faced large-diameter reel requires no such device, but, on the other hand, usually adds a few inches to the overall height of the locomotive.

Cable reels of both types were originally mechanically driven from the locomotive axles, but this was found unsatisfactory

because in coming out of a room of any considerable pitch or grade the locomotive runner is likely to lock the wheels. This would stop the cable reel winding in and would allow the locomotive to run over and destroy the cable. Gathering locomotives are usually designed to operate at a speed of from 6 to 7 m.p.h. at the normal rated drawbar pull.

Quite recently operators have questioned whether it would not be better to reduce this speed to approximately 3 or 3½ m.p.h., it being found that few gathering locomotives exceed this speed and that the locomotive runners waste much energy, for they run their motors in parallel with a large quantity of resistance in series. A slow-speed gathering locomotive was designed and installed for one of the large coal companies, and it was found that the daily power consumption was greatly reduced with practically no reduction in the output of coal.

The question naturally suggests itself, why, seeing that most locomotives have two motors and that high speed is obtained by operating the motors in parallel, a series-parallel controller could not be used, which would give practically half speed when operating the motors in series, and also give high speed with motors in parallel when desired. This scheme is entirely feasible and is open to but one criticism, namely, that the locomotive runners will not operate their motors in series but prefer to run in parallel on resistance, notwithstanding all rules and instructions to the contrary.

## ARE GATHERING LOCOMOTIVES DESIGNED TO TRAVEL TOO FAST?

**O**NE company has found that the daily power consumption is greatly reduced and the tonnage not materially lessened by reducing the rated speed of gathering locomotives, for motor-men usually leave much resistance in the circuit, it not being safe or convenient to run in rooms at high speed. The answer to the question is found in the definition of a gathering locomotive. If long runs are made over heading track with short trips or in changing from one gathering center to another, speed is desirable. If the gathering is merely from room to heading the rated speed will not be used.

From a paper on "Electricity in Mines" read at Pacific Coast Convention of the American Institute of Electrical Engineers, Pasadena, Cal., Oct. 13-17. A part of the same paper will be found in last week's issue.





#### Tandem Unit

Where large loads must be hauled some companies use extra heavy single locomotives while others use two moderate-sized units in tandem. There are few, if any, locomotives larger than 20 tons in the anthracite region because here the practice is to use tandem units on stiff grades or long hauls. Single locomotives weighing 30 or more tons are not uncommon in the bituminous coal fields.

The electrical equipment on the gathering locomotives generally consists of two motors totally inclosed and rated on a 75-deg. C. rise full-load one-hour basis. The design of the motor has been materially improved these past few years and today the gathering-locomotive motor operates about as well as any standard industrial motor.

#### ANTI-FRICTION BEARINGS REDUCE BREAKDOWNS

It is equipped with interpoles, and in the better designs has liberally proportioned anti-friction bearings. This latter feature alone has cut down the locomotive repair bill materially. The old-style bearings wore badly, and as the inspection was not of the best, the locomotive would run until its armature struck the pole pieces which usually necessitated a complete rewinding. With anti-friction bearings this complaint is practically unknown.

Most controllers are of the series-parallel type, so well known that no description of them is necessary. Within the past few years, however, one of the large manufacturing companies has built as a standard part of its line a controller of the series-parallel type with an auxiliary cylinder, which, when moved into the proper position, gives the operator complete control of his trip by a dynamic brake action of the motors. This arrangement lightens the manual work of the mine locomotive runner and has proved popular where installed.

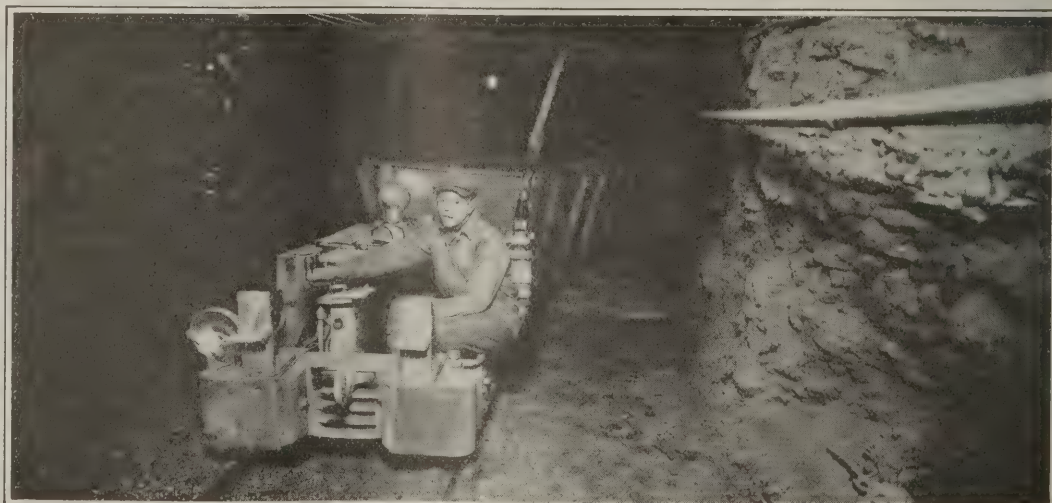
The place of the storage-battery locomotive is in my opinion rather limited. Many locomotives of this type have failed mainly because they have been used under conditions for which they were unsuited. Locomotives were put on long hauls that were designed only for short ones. The result was a rapid battery deterioration and consequently heavy renewal charges. I do not mean to indicate by this that the storage-battery locomotive has no field in the mine. In many cases it has a field, but it is not nearly so general as was first anticipated.

Properly designed and operated, the storage-battery mine locomotive has a battery large enough to carry it through a day of normal operating conditions and after an all-night charge is ready for service the following morning. Batteries are usually mounted in a box which is easily removable from the locomotive, so that a new battery can be substituted when desired. The standard speeds of battery locomotives do not exceed 4 m.p.h. at rated drawbar pull. The direct current for charging a storage battery is furnished usually from a motor-generator set installed in the charging room and controlled through a battery-charging panel.

Main-line locomotives are of the same general construction as cable-reel locomotives. Their function as the name indicates is to operate along the main haulageways transporting loaded cars to the foot of the shaft and empties to some central point. In sizes they

#### Gathering Type

Many haulage accidents are due to the manner in which locomotives are maintained—or rather not maintained. The headlight on this locomotive once was new, as also was the controller, which is now half off ready to flash an arc at the motor-man's arm or spit copper into his eyes. Abuse, not use, is the cause for high maintenance costs.





run usually from 6 to 30 tons. The motors are rated on the same basis as the gathering locomotives, and the control is of the series-parallel type.

#### SERIES-PARALLEL CONTROL FOR BATTERY UNITS

One comparatively recent improvement developed for haulage locomotives is the substitution of the ordinary series-parallel controller by a master control and contactors. The main-line currents are handled on contactors of the same general design as those used in street-railway work. Locomotives so equipped have created a favorable impression, and this method of handling main-line currents on contactors in all probability will be adopted by all manufacturers of trolley-type locomotives.

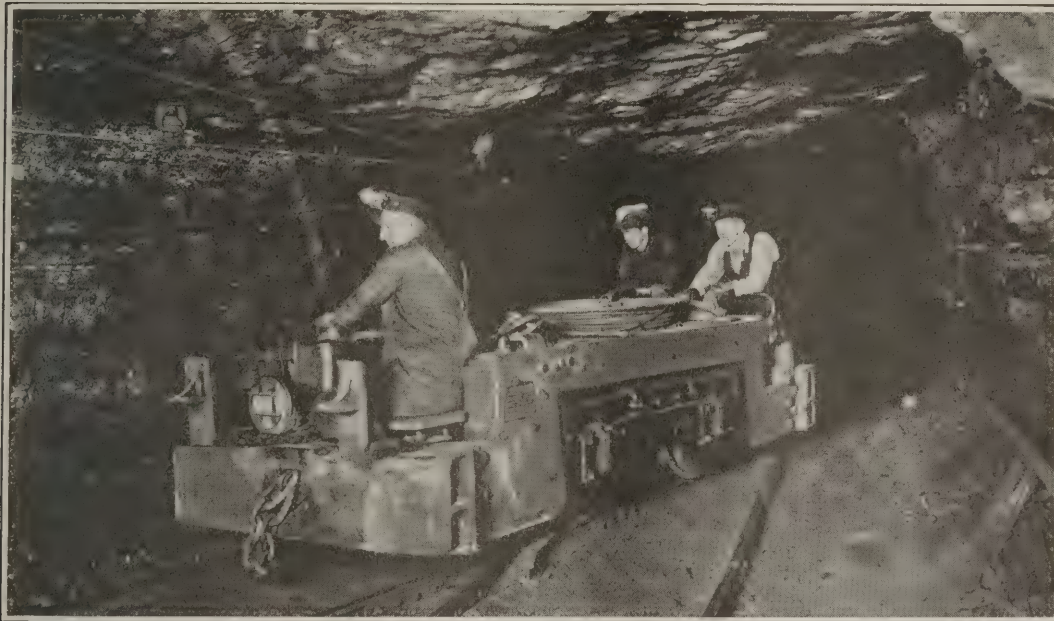
Another important change of design in mine locomotives of all types is in the method of carrying the weight on the axles. Leaf springs with equalizing levers are arranged so that an equal weight is carried on each wheel irrespective of track conditions. This is obviously of great advantage when the locomotive

outdoor or indoor type and is designed along the same lines as similar step-down substations in other industrial work.

Conversion from alternating current to direct current is accomplished either through a motor-generator set or a synchronous converter. If the synchronous converter is used, further transformation of the alternating-current voltage is necessary. If the motor-generator set is used, a motor can be operated directly from the 2,200-volt bus.

#### WHEN TO USE A SYNCHRONOUS CONVERTER

Many engineers fail quite seriously to appreciate the principles which dictate the choice between a motor-generator set and a synchronous converter. At first glance it would seem as though the synchronous converter, because of its higher efficiency, should be used in all places. The determining factor lies largely in the nature of the power supply. If the operator is sure of a constant-voltage supply and does not require any over-compounding of the voltage and is in no need



#### A Go-Getter

There is much questioning in the minds of many men as to the relative values of a trolley locomotive equipped with a cable reel and a battery locomotive. Undoubtedly each has inherent advantages and the only way to make a proper selection is to solve each haulage problem by itself, otherwise one or the other type locomotive may be misapplied.

must travel over rough mine track. In the older types of locomotives when operating on uneven tracks, the weight on the wheels varied greatly, which in turn reacted upon the drawbar pull. The general arrangement of these levers and equalizing devices can be seen in the illustrations.

The larger locomotives are equipped with air brakes and a suitable compressor. The usual motor equipment on modern locomotives is of such capacity as to give approximately 10 hp. per ton of weight on the drivers, the rating being as before stated on a basis of 75 deg. C. rise at rated drawbar pull for one hour.

No practical mine locomotive has been built using alternating-current motors. It, therefore, becomes necessary to provide the locomotives with direct current. Power is delivered to the mines in the form of high-voltage alternating current. This power must be transformed to a suitable voltage and then such of it as is necessary must be converted to direct current for supplying the mine locomotives and mining machines for undercutting the coal.

The step-down transformers are of the usual type transforming the transmission voltage to 2,200 volts. The transformer end of the substation may be of the

of power-factor correction, then the indications point to a synchronous converter.

If, however, the line voltage is variable, any percentage reduction in voltage on the alternating-current side will produce a corresponding reduction on the direct-current side wherever a synchronous converter is used. This reduction in voltage means to the operator a reduction in speed of practically every piece of machinery operating on the direct-current system which reacts in practically the same percentage on his output. If he requires power-factor correction, standard mine motor-generator sets are designed to operate normally at full load with 80 per cent leading power-factor in the synchronous motor.

Synchronous converters cannot be used for power-factor correction beyond operating them at unity power factor. The direct-current voltage of the motor-generator set can be held constant irrespective of the alternating-current voltage fluctuations. The generators of the motor-generator sets can be readily compounded if it is so desired.

The load on a motor-generator set is extremely variable and the set must be built to withstand and commutate satisfactorily 100 per cent overload momen-



tarily and should be capable of carrying 50 per cent overload for 2 hr. without any injurious temperatures resulting.

The control of power-converting apparatus and the units themselves must be capable of withstanding numerous short circuits. One side of the direct-current bus is always grounded. Consequently, the fall



**All Three Motors Do Their Work**

To permit each motor to take its share of the load equalizing members inter-connect the three axles under this unusual locomotive.

of a trolley wire in the mine, which is a frequent occurrence due to faulty roof conditions, will cause a dead short circuit. The control must be capable of removing this short circuit from the generator as quickly as possible.

In large operations it is common to find underground substations working in parallel with stations on the surface. The alternating current supply for these underground stations may be taken down through a borehole or when the proper precautions are taken may be carried through the airway or even through the haulage-way to the substation. The voltage of the direct-current power supply for mines is either approximately 250 volts or 500 volts, the higher voltage installations becoming scarcer as time goes on.

#### SUBSTATIONS NOT SHUT DOWN BY LOAD FAILURE

Many of the modern substations are equipped with full-automatic features exactly the same as many of the railway automatic substations with a possible exception that I know of no mine substation which shuts down on failure of load. This added feature would not be practical in most mines as the load is varying continually in the substation from a maximum to minimum at short intervals of time.

The automatic features, however, which are included are as listed below. These protective features apply to both synchronous converter and motor-generator substations containing one or more units and are arranged to protect against, alternating-current overload, direct-current overload, direct-current reverse power, direct-current reverse polarity, alternating-current undervoltage, loss of motor excitation, loss of generator excitation, single-phase starting, imperfect starting, overheated bearings, overheated windings, and overspeed.

Perhaps the most interesting feature of automatic control is the direct-current breaker which will open on an overload or short circuit and will remain open until the short circuit has been removed, after which it will close automatically. In view of the many short circuits to which substation apparatus is subjected, some few operators have installed what is known as a high-speed circuit breaker.

With the ordinary circuit breaker much time elapses from the time the short circuit occurs until it is stopped

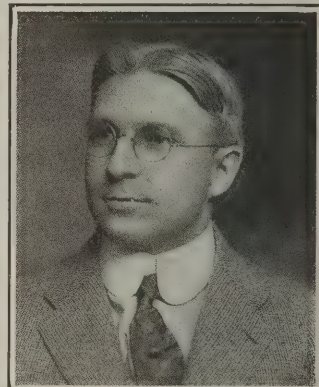
by the circuit breaker, and frequently machines will arc over under this condition. Even if they fail to arc over much burning of the brushes and sparking of the commutator ensues. The high-speed circuit breaker will completely disconnect the machine from the line in less than 0.01 sec. This rapid action prevents the current from rising to any high value beyond the setting of the circuit breaker and consequently it takes the shock of a dead short circuit from the machine.

## European Mines Use Electric Current Less Than We Do

However S. D. Dimmick and H. M. Warren of Glen Alden Coal Co. Learned Something From Them About Tunnel Building and Briquetting

(An interview by R. J. Arthur, Scranton, Pa.)

AMERICAN coal mine operators have little occasion to look to Europe for suggestions on mine electrification. The coal men of Germany, Wales, Belgium and other countries of Europe have not yet overtaken the American producers in the adaptation of electricity to mining methods. Although electricity is used in European mines to perform the same services as in America, its use is restricted and less general. The quantity of electric power consumed by mines abroad cannot begin to compare with the meter readings at American collieries. However, there are interesting things to be learned in Europe's coal mines.



**S. D. Dimmick**

Vice-President and general manager, Glen Alden Coal Co.

The foregoing summarizes the opinion of H. M. Warren, consulting engineer of the Glen Alden Coal Co., who with S. D. Dimmick, vice-president and general manager of the company, recently returned from a tour of inspection of the mines of Wales, Scotland, Belgium and Germany. The anthracite coal company officials found many interesting features at the mining operations abroad and were greatly interested in the various methods of mining, primarily the longwall, which, while not new is seldom used in this country. A study of this method was made with particular reference to the mining of thin seams and many features noted are of particular value in developing methods of mining thin seams in this country. Much other valuable information was obtained.

#### NO ELECTRIFIED TRACKAGE

Throughout the mines on the continent and in Great Britain the visitors found practically no electrified trackage. Rope or chain haulage systems proved to be the most popular, and with these systems the loaded cars were usually moved at a pace not faster than a walk.

The reason for the absence of electrified track in the workings is explained in great part by the system of mining in use abroad—the longwall system—Mr. Warren found. Then again, the cars used for conveying the freshly mined coal are much smaller than those in



use in America, weighing, when loaded, about 1,500 lb. These cars are easily handled by the men in the workings and it would prove a difficult task to demonstrate that electricity would enable the more efficient movement of the cars along the operating face.

In one instance the Welsh operators have adopted electricity in a capacity used in few American mines. It was found in the inspection of one mine in Wales that at the working face the miners are aided in their work by electric lights strung overhead. The lights are moved as the face advances.

A shaking chute installed along the working face for a distance of 450 ft. and pitched at a 10-deg. angle led to the car-loading point. The coal was shoveled into this chute and the forward and backward motion moved it at a fair rate of speed to the waiting car. The chute, as well as the undercutting machine, was operated by electricity. This type of shaking chute is in use in mines in Germany and Belgium, the American visitors later learned.

The electric motor driving the chute was located in the return airway near the upper end of the chute and the coal was undercut by an electric undercutter of the bar type. As explosives are seldom required because of the pressure on the coal, hand picks, and in some mines where the chute and coal cutter are driven by compressed air, picks operated by air are used to bring down the coal.

On the surface, electricity is put to the same use in European mines as in American, but not on as large a scale. In the breakers, washeries and other coal-preparing plants electric power figures prominently. Electric shaft hoists are used quite extensively; pumps, rope haulages inside the mines are electrically operated. However, the use of pumps is not nearly as general as in the American anthracite field. For example, it was learned that European operators pump an average of not over one ton of water to a ton of coal mined, as compared with 11 tons of water to a ton of coal in the Pennsylvania anthracite field.

#### SMALL POWER PLANTS PROVE ADEQUATE

The power plants at the mines abroad, Mr. Warren learned, are as a rule not as large as those producing current for American mining operations. This is due, of course, to the fact that less power is used and small plants prove adequate. At the present time a movement is under way, and is especially indicated in Wales, to consolidate the various individual plants into a chain or power system as is the case with several of the hard coal companies, especially the Glen Alden Co., in this country.

This tendency was regarded by the American visitors as a manifestation of the European operators' growing appreciation of the value of electrified mines.

One of the outstanding features of mining on the continent is the enormous production of briquets, the manufacture of which in the anthracite region in this country has proved more or less of a money-losing proposition. Messrs. Warren and Dimmick saw barge load after barge load of briquets moved through the Rhine district. They were advised that most of it was reparation coal, and was the product of German operators whose methods of production of briquets have met with much success. In France, Italy and Switzerland the visitors noted that large quantities of briquets are used by the railroads, but the general practice is to



H. M. Warren  
Consulting engineer, Glen  
Alden Coal Co.

carry both bituminous coal and briquets on the locomotive tender.

Although several methods of preparing the briquets were in force, one in particular, which is said to be the latest and most improved, attracted the attention of the visitors.

By this system the coal was induced into a long cylinder lined with vanes. The cylinder continually revolved and dropped the coal from top to bottom as it turned. At one end of the cylinder, or kiln, as it is called, the heated binder, usually made of coal tar, was sprayed through the dropping coal by steam and compressed air. This thoroughly mixed the binder and coal and the mixture was drawn out the opposite end and conveyed to the presses. It is claimed by the advocates of this system that from 1½ to 2 per cent less binder is used than with any other method and that a better briquet is produced.

#### NEW METHOD OF LINING TUNNEL

Another interesting development which attracted the attention of the tourists was a new plan of lining a tunnel in deep workings to withstand the enormous pressure which sometimes will crush massive brick tunnel linings. By the new method, which the originator claims to have patented, concrete blocks are used. These were placed in the tubular passageway under construction, but one is omitted every so often in the construction and in its place a wood block is used. The wood block is a cushion relieving some of the pressure and preventing the lining from buckling. Thus far the system has been used with success. It remains to be seen what effect time will have on tunnel linings so constructed.

Economic conditions in the industry abroad were studied to some extent by the American visitors. They concluded that the dormant power of the coal industry in Germany will rise with the re-financing of that country, and with cheaper labor, advanced mining methods, excellent quality coal and lower prices Germany will compete with other European countries for the best markets.

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WHO WOULD HAVE DREAMED that such a resolution as this ever would be necessary to protect the headquarters—not to mention headquarters and other anatomical divisions of Local 944 United Mine Workers, at the sweet city of Herrin in "bloody Williamson" County, Illinois? "Be it resolved that any member of Local Union No. 944 caught with concealed weapons on him in the hall, shall be fined \$10 for the first offense, \$25 for the second offense and for the third offense shall be expelled three months and fined \$25, the fines to be paid to the man furnishing the evidence. Adopted at a regular meeting, July 8, 1924."

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MINE VENTILATION seems superior to that below decks in big ships. If the Leviathan hit a rock, for instance, what protection would its vaunted 60,000 cu.ft. of air per minute be against damps?



# Electric Light Plants Contemplating a Plunge Into Gas, Coke and Byproduct Business

National Electric Light Association Is Presented Lengthy Report on Coal Distillation Products—Low-Temperature Carbonization Said to Be Still Commercially Unsuccessful—Gas Making at Mines Suggested

GREATLY significant was the fact that the Prime Movers Committee of the Technical National Section has presented the National Electric Light Association with a report on the Distillation Products of Coal in which articles were contributed by A. G. Christie, V. Z. Caracristi, F. P. Coffin, Arthur D. Little, Inc., and T. C. Keating. Only A. G. Christie's remarks appear in this summary.

Coal men are less awake than the electric light officials to the possibilities of making low-temperature coke and the byproducts that go with it and the advantages, if any there be, of the complete gasification of coal at the mines. It appears that the electric light associations are taking a more fundamental interest in the study of coal treatment than the coal operators themselves. The anthracite region may well interest itself in the activity of the central power stations in planning to make a fuel that will compete with hard coal. An abstract of the report follows:

"Some thirty or more major processes for low-temperature distillation are now in varying stages of development in this and foreign countries. The available information regarding the more important of these has been ably reviewed in the 1923 report of the American Gas Association's committee on Low-Temperature Carbonization and Complete Gasification of Coal. That committee's report summarizes these processes in the statement that:

"There have been no developments along low-temperature lines in this country or in England which would justify any assumption that the art has passed from the experimental into the commercial field. Coal most certainly has not been distilled at low temperatures on a money-making scale, yielding profits sufficient to carry the operating costs and the capital charges. It has been tried experimentally; on a semi-commercial scale, and in one case in a full-sized commercial plant, but it must be recognized that so far none of these attempts has been entirely satisfactory."

"Keen interest has been displayed by various manufacturers in the subject of low-temperature distillation and a disposition to start commercial activity if and when an opportune time in the progress of the art arrives. It seems, however, that on account of its varied nature, the problem lends itself better to commercial solution by ultimate users rather than by equipment manufacturers.

"The determination of the form in which the distillation products will have maximum commercial value continues to occupy the attention of investigators. Much

progress is being made particularly in the use of low-temperature tar oils as a wood preservative. It is now becoming generally conceded that they can be used satisfactorily for this purpose.

"The increasing cost of anthracite fuel for domestic use is proving an incentive to the development of a smokeless fuel made from high-volatile coal. On the other hand, the present low prices of petroleum products act adversely where they determine the price at which certain coal-distillation products can be marketed. The particular incentive in this case is to have a satisfactory process worked out that will be available when higher prices for petroleum products prevail.

"The following statement was received from A. G. Christie, of Johns Hopkins University, as to the present status of coal distillation, and this is embodied in the report:

"Research work on the distillation products of coal during the past year has tended to emphasize more clearly the three fundamental processes that should be kept separately

in mind when discussing distillation. These processes are typified by: (a) Coke ovens, (b) low-temperature gasification, and (c) complete gasification.

"The first process produces a prime quality of coke and also yields about 10,000 cu.ft. of 550-B.t.u. gas per ton of coal, together with 12 gal. of cracked oils and pitch. The second process per ton of coal treated produces about 20 gal. of first-quality oils, about 4,000 cu.ft. of gas with a heating value from 600 to 800 B.t.u. per cubic foot and a coke containing enough volatile matter so that it can be marketed for domestic purposes as a substitute for anthracite. The third process produces the maximum quantity of heat in gaseous form but of varying volume and composition and of low heat value per cubic foot, together with about 20 gal. of oil but no coke.

## COKE OVENS, BAKE OVENS AND GAS PRODUCERS

"The first process is well perfected in the beehive and byproduct coke ovens. The products are well known, and means have been developed to utilize commercially the oils and tars produced and to wash the gases of benzol and other motor fuels.

"The second and third processes are less highly developed, but, because they present interesting possibilities, they are attracting great interest among engineers and inventors. Oils from low-temperature distillation processes proved of great value to Germany during the war as a source of motor fuels and lubricants. Much

COKING process gives prime coke, 10,000 cu. ft. of 550-B.t.u. gas and 12 gal. cracked oils and pitch per ton carbonized. Low-temperature distillation provides a substitute for anthracite, also 4,000 cu. ft. of 600 to 800 B.t.u. gas per ton and oils, mostly of the creosote series and paraffins. Complete gasification gives maximum heat content in gas but of low heat value per cubic foot with about 20 gal. of oil and no coke.



interest is also centered on producing a satisfactory anthracite substitute for domestic purposes. The coke from low-temperature processes offers much promise as it is both smokeless, ignites readily and is comparatively free from dust and dirt. The problem in this country has been to find a way to operate this process at a profit. At present, and for some time to come, it is probable that the price of motor fuels, lubricating oils, etc., derived from crude petroleum will be so low that artificial products from coal distillation will be unable to compete with them on a basis that would offer sufficient financial return to make the process pay.

"American chemists have only started to study intensively these products of distillation and have not yet determined what useful substances may be refined from such oils, or the processes by which they may be produced commercially. It is well to remember that whereas coke-oven oils tend toward the well-known coal tars because the products, to a degree, are cracked in the ovens, the oils from low-temperature distillation tend toward the creosote series and to paraffins. Should the latter process be widely developed, it will be necessary to find a greatly enlarged market for oils of the creosote series. At present prices, it will not pay to attempt to refine paraffin oil from the low-temperature distillation products, although this may be worth while at a later date. The motor fuels derived from washing the gas and distilling the oils are suitable for commercial use and may even now be sold at slightly higher prices than gasoline. The yield of such oils is, however, small with most American coals. It will, therefore, be evident that small commercial returns can be expected at present from the oil products of this process.

"The gas produced has high heating value and would serve satisfactorily for domestic purposes and city distribution. This provides a lucrative market for this product. When high-heat gas is produced, however, heat must be furnished to the retort from some outside source. In certain cases, producer gas has been proposed for this purpose. This lessens the efficiency of the process.

#### SEMI-COKE MADE TO SUPPLEMENT ANTHRACITE

"Evidently it is to the resultant coke of the low-temperature distillation process that one must look for financial returns to justify the process. The ever-increasing price of anthracite in the East and the increasing smoke nuisance in the Middle West is steadily adding to the commercial possibilities of the process, and it is probable that it will be rapidly developed, its primary object being the substitution of this coke for other domestic fuels.

"The third process has been developed in many forms. The bituminous gas producer, so largely used in the steel industry, and the water gas sets used in making illuminating gas are too well known to require description. The primary object in each case is the complete gasification of the fuel and any tars that may result are generally regarded as unavoidable losses incident to the process.

"The two processes of complete gasification just

mentioned have been made the basis of some of the newer developments. The Mond process, for instance, uses steam in the entering air to keep it down to producer temperature, so that a modified form of low-temperature distillation takes place. Others have gone further and have actually combined low-temperature distillation with the water-gas process as in the Strache system. A plant at Bologna, Italy, built on Strache patents operated satisfactorily for some time on Fairmont, W. Va., coal. These modified processes besides yielding

large volumes of low-temperature distillation oils, also produced gas of higher heating value than that made in producers. Stache claims that the gas has a heating value of 300 to 400 B.t.u. per cubic foot. Later processes of higher efficiency are being developed which combine the Mond process with the low-temperature distillation method, and these later developments appear quite promising.

"In this country the Carbocoal process is operated primarily as a low-temperature distillation system to produce substitutes for anthracite. The Piron process, now being developed, apparently has the same object in view. The Bussey process, has the same purpose, namely, the production of a smokeless domestic fuel from soft coal. It achieves this result by allowing a portion of the coke formed to burn to producer gas which in rising through the retort distills off the low-temperature oils. The resultant gas is, therefore, much leaner than that from the two preceding processes.

#### CAREFUL STUDY GIVEN TO SUBJECT IN BRITAIN

"American engineers are not alone in their interest in low-temperature carbonization methods. The subject is being given close study in Great Britain, where the government has carried out some extensive research work on which reports have been issued from time to time.

"At present the public-utility engineer has little interest in these processes unless he has charge of a gas plant as well as an electrical station. This condition, however, may change rapidly, for there are possibilities in these new processes that may prove of consequence to central-station men. Increasing demand for a smokeless fuel may make it advisable for certain central-station companies to organize subsidiary concerns for the purpose of producing such fuel. The byproduct gas, if of high heat value, may be turned over to the local gas company or sold to manufacturers if of low grade, or it may even be burned under the boilers of the central station. Waste fuels such as coke breeze and dust may be burned efficiently under boilers. Combining the byproduct plant with the central station would lessen coal storage and unloading expense and would afford the gas plant a means of getting rid of waste products.

"A still more interesting possibility is the transmission of fuel from mine to central station by means of gas pipe lines. The increasing freight rates on coal and the improvements being made in the efficiency of several gasification processes raise the question as to the advisability of converting all fuel into gas, oils and ash at the mine mouth transporting only the gas to



the point of consumption. This is a particularly pertinent question where near-by low-grade coals are used as in certain places in the Middle West and where such coals may run 30 per cent or more of total moisture and ash.

#### GAS SYSTEM AIDS PLANT EFFICIENCY

"It does not seem economic to pay freight on this waste material as well as handling charges on the coal and ash at the central station. Gasification at the mine would relieve the central station of its ash disposal problem. The elimination of coal bunkers, coal preparation and handling equipment, stokers, ash bins and ash-handling equipment, soot blowers, dust catchers, etc., would lessen the investment in the power station, though this might be offset by an investment in reserve gas holders. Power-plant operation would be simplified if gas were employed as fuel, and labor charges would be reduced. No smoke would be produced, which, alone, is a consideration of appreciable value. Furthermore, the use of gas should make higher plant efficiency possible.

"Many factors, therefore, favor this system. All of them would have to be considered as well as the fixed charges and operating costs on the gas plant and pipe lines, together with the commercial value of the oils produced before a correct valuation could be made of this system. This problem will demand the attention of engineers in the near future and hence the importance of following closely all developments in the low-temperature carbonization and complete gasification of coal."

### Southern Rhodesia Has Seven Billion Tons Of Good Coal 20 to 46 Ft. Thick

AN ESTIMATE of the coal of economic value in Southern Rhodesia contained in seams of workable thickness, situated within mineable distance from the surface and which is said to be quite conservative is 969,411,000 metric tons, according to H. B. Maufe, in a paper read before the World Power Conference. This statement is based on the 1914 report of the Rhodesian Geological Survey. Subsequent exploratory work, says Mr. Maufe, especially in the Wankie coal fields has shown that the estimate is more than safe. The Wankie main coal has been found to be 28 to 30 ft. thick over a large area, and over a smaller area its thickness is 46 ft. The explored area of the Wankie field is perhaps 300 square miles and if the thickness is estimated at only 20 ft., the reserve of coal may be written in round numbers at 6,434,000,000 long tons. Later exploration in the Sebungwe coal fields permits us to increase the 1914 estimate to 300,000,000 tons. In the Sabi and Tuli coal fields, as no new information has come to hand, the figure remains at 80,000,000 long tons.

#### DEPOSITS ALMOST EXCLUSIVELY SEMI-BITUMINOUS

Thus the coal resources of Southern Rhodesia may be put at 6,814,000,000 long tons. In the 1914 estimate it was shown that 85 per cent of the coal was semi-bituminous, suitable for steam raising, and the other 15 per cent was in part bituminous and in part semi-anthracite. The more recent additions to the resources have increased the percentage of steam coal which may now be put at 98 per cent of the total resources.

From eighty-eight samples taken from the Wankie

colliery, the only producing coal mine, the following average analysis has been obtained: Moisture, 0.76 per cent; volatile matter, 23.77; fixed carbon, 65.70; ash, 9.77. The British thermal units obtained on combustion number 13,433 and the evaporative power is 13.89 lb. of water per pound of coal. At the New Colliery shaft, two samples gave 14,004 and 13,912 B.t.u., the ash being only 7.02 and 7.75 per cent respectively in these two samples.

### Steel Buildings Outlast Those of Wood

SURFACE buildings, fabricated of steel, and made sectional so as to facilitate easy assembly, are coming into favor at many coal mines. Their advantage is not restricted to low first-cost, for they possess other merits of almost equal importance. Mine owners who have erected them in place of buildings constructed of more massive materials assert that the objections raised to lightly-constructed buildings do not apply to the type made entirely of steel.

Fabricated buildings are permanent in the sense that they will outlast any ordinary mine, providing they



A Fabricated Shop in West Virginia

This building is 45 x 75 ft. in plan or plenty large enough to accommodate the electrical and mechanical departments necessary to the production of 1,000 tons of coal per day. Not only can such buildings be erected quickly but if placed on suitable foundations, and kept drained and painted they will last indefinitely.

are amply supported on good foundations, are painted periodically and are properly drained. Such buildings are so well proportioned that drafts are eliminated, there being no wide cracks between adjacent sections. As the superstructure is composed of steel members and the siding is of the same material, fire represents no hazard. Windows and doors can be located wherever they will serve their purpose most effectively. The ultimate salvage value, the portability of the fabricated building, as well as its convenient construction which allows additions to be made at any time without interfering with current operations, are no more striking advantages than the constructional details which enable such a building to be erected in a small fraction of the time required for the building of a brick or other "permanent" structure.

SINCE LONDON'S 4,500,000 people use less generated power than St. Louis' 1,000,000, there is an irresistible chance for the admiring Irish to say the English have strong backs but weak minds.

COAL MEASURES in Congress are often more gaseous than coal measures in the ground.



# How to Make Preparations Against a Fire or an Explosion and What to Do When It Occurs

Statistics Based on 164 Disasters of This Kind as Studied by Engineers of  
Bureau of Mines—Five Hundred Lives Saved by Fan Reversal  
—No Lives Lost by Reversing Fans

By D. HARRINGTON<sup>1</sup> AND M. W. VON BERNEWITZ<sup>2</sup>

**I**N STUDYING the mine-disaster files of the U. S. Bureau of Mines for preparation of a bulletin<sup>3</sup> on coal-mine explosions, a table was compiled covering various features of fan installation and the handling of air currents at the time of and after the disasters. As a sidelight on this discussion the loss of life and number of men injured also was tabulated.

Of the 164 disasters tabulated, 143 were explosions, 14 were fires, and 2 involved both fire and explosion. The total loss of life was 4,158 and 412 men were injured. One hundred and forty-five disasters occurred in bituminous-coal mines, 13 in anthracite mines, 2 in lignite mines, 1 in a cannel-coal mine and 3 in metal mines. By states, 35 took place in Pennsylvania, 17 in West Virginia, 16 each in Oklahoma and Alabama, 15 each in Kansas and Illinois, 12 in Indiana, 7 in Colorado, 6 in Kentucky, 3 each in Ohio, Tennessee and Wyoming; 2 each in Arkansas, Montana, Washington, Virginia, New Mexico and Utah and 1 each in Iowa, Missouri, Maryland and California.

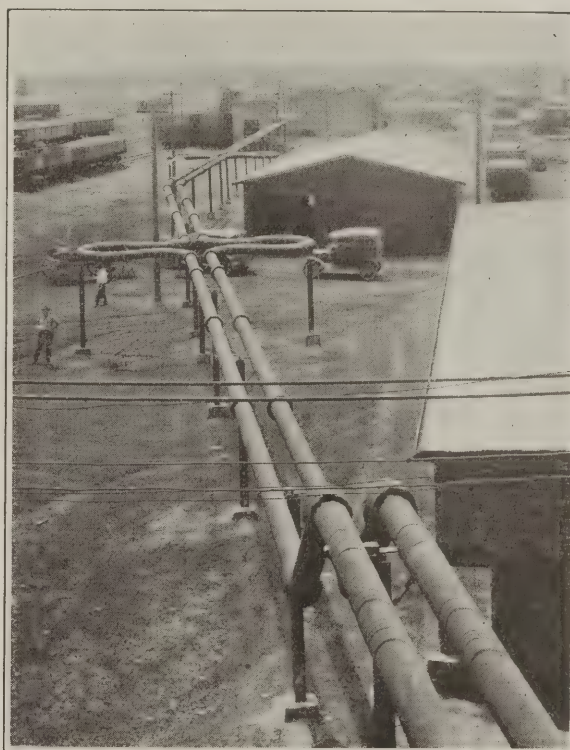
The fans at 47 of the mines were steam-driven, 36 were driven by electricity, 4 by either steam or electricity, 2 by gas and one by either gas or electricity. Information is lacking as to the method of driving the fans at the remaining 75 of the total of 164 mines tabulated. As to the method of ventilating, 103 fans were operated exhausting and 64 were blower or pressure fans. In 42 instances the fans were equipped for quick reversal of the air current in case of necessity and 19 were non-reversible. Information is lacking as to the reversibility of the fans at the remaining mines. Some mines, especially in the anthracite region, have several fans. The capacities of single fans varied up to 350,000 cu.ft. per minute.

## LIFE OFTEN SAVED BY REVERSING AIR CURRENT

Immediately following ten of these disasters the air currents were reversed by use of the fan. This in five cases resulted in a saving of life, the number of lives preserved totaling more than 500. In one instance prompt reversal of the air currents by the mine officials after an explosion saved about eighty lives. In another and comparatively recent instance (1924) the direction of the air was promptly reversed by manipulation at the fan at the time of a mine fire, and over twenty lives were saved. In still another case, at the time of a coal-mine fire, through ability to reverse the air currents promptly, numerous lives were saved, and the reversibility of the fan was utilized frequently in fighting the fire. At least once, and probably in two

instances, reversal of the air drew methane over fires and explosions occurred, but without loss of life.

In the above list, which includes most of the major disasters that have occurred in the United States since 1907, there is not a single instance of loss of life having occurred directly or indirectly as the result of reversal



Here Two Fans and Two Steam Lines Guarantee Continuous Ventilation

The photograph from which this picture was made was taken at Zeigler, Ill. Each line has two loops to provide for expansion.

of the direction of air currents by fan manipulation. However, in a number of instances in recent years there has been loss of life due to reversal of air by a fire, there being no fan available to control the direction of the ventilating current. In some instances there undoubtedly has been loss of life because the fan was non-reversible and a reversal of air currents could not be effected without serious loss of time.

An incident at one mine is worth recording, as being a detail worth watching: At the time of the explosion the explosion doors on the fan housing opened and thus saved the fan from injury, but by some means the reversing door was forced halfway over the air duct and remained jammed until it was discovered and moved back.

In at least two cases after the fan was put out of commission by explosions a reserve fan was used. In

<sup>1</sup>Formerly mining engineer, U. S. Bureau of Mines.

<sup>2</sup>Mining and metallurgical engineer, U. S. Bureau of Mines.

<sup>3</sup>Von Berenwitz, M. W.; Rice, G. S., and Paul, J. W.; Causes of and Lessons from 200 Coal-Mine Explosions, Bull. 237, U. S. Bureau of Mines (in preparation).



at least one instance, also, many lives (probably more than 100) were undoubtedly saved by having a reserve fan ready for use. In one case at the time of a disaster the fan was stopped, and the methane that accumulated came in contact with burning feeders and caused an explosion. In one coal mine an underground fan was driven by a gas engine, and when a fire started the gas tank exploded and thirteen men lost their lives. In another instance in a metal mine a fire started underground at the motor of an electrically driven fan and twenty-one lives were lost. In connection with this latter disaster it may be stated that during recent years many fires in metal mines have been started by electric motors serving underground fan installations, these being chiefly small temporary units for the ventilation of blind ends where tubing is used to carry the air to the face.

#### HIGH-SPEED ELECTRICALLY DRIVEN FANS FAVORED

Modern practice at coal mines seems to favor electrically driven high-speed fans in fireproof housings on the surface, and although such fans usually are operated exhausting they are equipped with doors, so that, if necessary, the air currents may be quickly reversed. Many up-to-date properties are fitted with a second or auxiliary fan, or at least a second source of power for the fan drive. One successful installation of this kind is located in Alabama. At this plant when the electric power for the fan was cut off by an explosion a kerosene engine with a jaw-clutch attachment to the fan shaft was put into commission within 15 minutes with practically no interruption of air circulation, thus saving many lives. Here an ingenious small-capacity compressed-air installation allowed almost immediate starting of the kerosene engine. Frequently there is much delay and difficulty in starting gas engines that at best are used only occasionally.

Present-day practice at coal mines demands that the fan be installed well out of direct line with the air-course leading to it. It also should be provided with suitable outward opening and easily operated doors in the direct line to allow of quick relief of pressure in case of explosion, thus protecting the fan from the explosive force. The record shows that in at least eight instances the relief doors operated and saved the fans. In two severe explosions during the past few years the fan approach purposely was made of flimsy material, yet kept tight by means of gunite. This

saved the fan by readily collapsing, and mine ventilation in each case was readily restored within an hour by temporary repairs.

In ventilating installations at metal mines the main fan frequently is placed underground. This is a practice that would not be tolerated in coal mines. It entails positive dangers in metal mines, though undoubtedly it is advisable in some cases. Exhaust fans predominate at coal mines and are fairly common at metal operations. They draw the ventilating current from airshafts, thus making the hoisting shafts downcasts. Pressure fans also are common at metal mines, and there are good reasons for both practices.

#### EXHAUST FANS PREFERRED AT COAL MINES

At metal mines it frequently is necessary to force back into the surrounding workings heated air or gas issuing from the adjacent strata or from timber. To do this it is advisable to maintain the air in working places under slightly increased pressure. On the other hand, it seems advisable to pull (exhaust) as much as possible of the methane, the principal gas found in coal mines, out of the worked-out or abandoned sections and into the circulating air so as to render it non-explosive. Moreover, it is felt that should the methane in coal mines be forced back into the goaf, or into abandoned sections by pressure ventilation (hence by extra air pressure within the mine), as soon as there is any relief of that pressure, such as might result from a change of barometer or slight or total interruption to air circulation, excessive quantities of gas would be released as a result of the decreased pressure. This would be dangerous. However, some coal mines use pressure ventilation, and some metal mines employ the exhaust system.

In one metal-mining district where many of the principal fans were blowers, causing the main haulage and travelway to be the return aircourse in time of fire, the gases cut off the travelway. Later on, however, the main fans of this district were changed to exhaust units, with intake on the main haulage and travelway.

Though hazardous in any mine, the placing of small fans (boosters) underground to assist in air distribution is dangerous and inefficient in coal operations, yet this is considered good practice in metal mines. In any underground fan installation the adjacent workings should be thoroughly fireproofed, even though the fan is but temporarily in any one position. In coal mines



#### Fan Installation

At an Illinois mine. To the right is an auxiliary hoist. The curved duct on the right connects the fan-way with the shaft. Arrangements should be made here so that an explosion would open a door or break out a portion of the curved duct so as to save the fan from violence.



### At Baker Breaker

Fan installation of the Glen Alden Coal Co., near Scranton, Pa., with an *evase* discharge opening. Modern fan houses are made of permanent construction, for the fans are the lungs of the mine. This is normally an electrically driven fan, but the piping shows that steam power also is provided.



the greatest possible care should be taken against ignition of methane at fans by short-circuiting either after fan stoppage or otherwise. Such ignitions are liable to cause great damage.

There is a diversity of opinion as to what should be done at the fan in time of disaster. As a matter of fact no set rule can be given, except that if damaged by the explosion or fire, the fan should be placed in running order immediately. All mines, whether coal or metal, should have the ventilating system arranged so that the direction of air travel may be controlled at the fan; then in case of necessity the direction of the air currents may be reversed within a few minutes. No change should be made in the usual coursing of air unless available information indicates that advantage may be gained either by stopping the fan or by reversing the air.

Many mining men advocate stopping the fan immediately upon learning of trouble underground. This may be good policy in some instances, but there are others in which it would certainly result in disaster. In the first place, merely stopping the fan does not insure that the air currents will stop, and if it is desired to stop the air flow, other definite steps, such as placing brattices or the opening or closing of doors, are necessary. Moreover, even if the air circulation is stopped at or near the fan, an underground fire quickly establishes its own circulation, and especially if the mine is gaseous there is grave danger of an explosion as the result of a local circulation of methane accumulations (arising from fan stoppage) over fires, ignited gas blowers, etc.

#### FIRE MAY REVERSE AIR CURRENT DIRECTION

Again, in case of a mine fire the fumes will have been carried through the mine in the usual direction of air flow until the fan is stopped. Frequently upon stoppage of the fan the fire reverses the direction of air movement, and thus fills the remainder of the mine with deadly gases. Reversal of direction of the air at or near the fan will not necessarily cause change of direction of air currents in the interior of the mine, unless provision has been made to hold doors closed, even where pressure against them becomes suction, or *vice versa*. Hence to make air-reversing installations at mine fans effective they should be tested at intervals to determine their probable efficiency in case of emer-

gency, and immediate action should be taken to remedy defects shown by the trial.

Observations by U. S. Bureau of Mines engineers after disasters indicate that underground workmen are prone in time of disaster to try to follow accustomed travel routes irrespective of their condition as regards falls, gases, etc. Consequently about as good a general practice as can be followed is to try to supply fresh air to the usual travelingways, so far as this can be done by causing the fan to continue to circulate air in them either in the usual or in a reverse direction. In order to accomplish this latter operation it is obviously desirable to have the fan installation of such a nature that reversal may be accomplished with minimum loss of time. On the other hand, it is equally obvious that no change should be made in the usual coursing of the mine air currents except under orders from a responsible mine official who has carefully considered the various phases of the existing conditions.

### Bituloid Adversely Discussed at Cardiff

When the South Wales Institute of Engineers met, Oct. 16, at Cardiff to discuss the paper of Prof. Henry Briggs and Norman H. Walls on the use of Bituloid, an emulsion of tar, as a means of allaying dust and preventing mine explosions (a paper that was briefed in the issue of *Coal Age* of Oct. 30), Guy de G. Warren declared that despite the fact that Bituloid had the desirable quality of oozing and so could soak up into new dust when it would fall onto any Bituloided surface, it could not be assumed that this ability to ooze would be maintained indefinitely.

In time the settling dust would no longer adhere and then a dangerous condition would be established, Mr. Warren declared that if, as the authors of the paper stated, a periodic cleaning up was desirable it would be found probably that the men engaged to do the work would long for the incombustible dust, feeling that it was a much easier and pleasanter material to remove from floor, roof and sides than a tacky substance like Bituloided mine dust that stuck to everything it touched.

J. W. Hutchison in expressing his approval of shale dust wanted to know how the authors of the paper proposed to deal with an accumulation of dust and Bituloid on heavy timbers.





## News Of the Industry



### Central Pennsylvania Operators Again Ask Readjustment of Union Agreement

Letter to Brophy Says Predicted Prosperity Has Not Materialized—  
District's Output Falls Behind Former Years—Increasing  
Business Going to Non-Union Fields

Readjustment of wages and working conditions is asked in a letter sent Nov. 7 by the Association of Bituminous Coal Operators of Central Pennsylvania, with headquarters at Altoona, Pa., to the United Mine Workers, District No. 2. The operators' letter, which was signed by B. M. Clark, president; G. Webb Shillingford, vice-president, and Charles O'Neill, secretary, was addressed to John Brophy, president of District No. 2, but requests an answer from the District Executive Board. The communication, in part, was as follows.

"In the recent past a number of statements were made public by representatives of the coal operators' association, which may be summarized as follows:

"The diminishing coal business in central Pennsylvania is caused partly by the general industrial depression under which all coal operators and other business men suffer, but principally by our unfavorable competitive position due to high cost of production in this district compared with a low cost of production in competitive districts. The high cost of production is due, of course, to the union wage scale, which is much higher than the wage schedules in effect in the non-union sections which are competitive with us.

"Two hundred millions of tons of the coal accessible to the Eastern markets and competitive with our coal is being produced from 50c. to one dollar per ton lower cost than coal can be produced in our district under the union wage scale."

#### Quote Miners' Statement

"The statement on behalf of the United Mine Workers said in part:

"Coal production has been at the lowest level in years. Consumers are not buying coal. Operators are not able to sell coal at any price because consumers do not want coal and will not buy it until they need it. Coal prices are now down to the lowest point in many years; still there is very little market.

"The reason for the operators' frantic efforts to set aside the present contract is obvious to anyone who cares to look into the matter. They are seeking to bring about a wage reduction when business is poor so that when business improves and they are

able to sell their coal they will make larger profits by reason of the reduction in wages to their employees."

"The joint wage agreements between miners and operators have been continuous since 1899 except during short periods of strike in 1906, 1919 and 1922. In all of this time and in all of these agreements the operators have never had wages reduced during the life of an agreement.

"In 1909 the operators asked for relief and were denied by the Mine Workers upon the ground that the agreement was binding and would not be changed.

"Five times in three years, however, agreements have been changed in favor of the miners to meet conditions as they developed during the period of the life of the agreement. The agreement was not ironclad when increases were being forced from the operators.

#### Conditions Alarm Operators

"The present situation in central Pennsylvania justifies the grave concern shown by owners of mine properties and the anxiety indicated by the business men and citizens of our communities. For the week ending Oct. 18 the country produced 10,255,000 tons. This is a large tonnage and equal to the average for this period of the year. A few weeks ago we were producing between six and seven millions of tons weekly. The seasonal demand for coal due to approaching winter is here. Your prediction of prosperity to central Pennsylvania has failed to materialize. The increased business has gone to other fields.

"During the five-year period from 1916 to 1920, inclusive, we mined 10.5 per cent of the total, or over 1,000,000 tons per week. To-day we are actually mining about 800,000 tons per week.

"The country has produced from Jan. 1 to Oct. 18, 1924, 363,156,000 tons. Had central Pennsylvania maintained its position it would have produced 38,131,380 tons. Instead we have produced but 30,670,782 tons, or have lost to other fields 7,460,598 tons of our share of the country's business. Of 40,882,000 tons produced in the country for September, our district produced only 3,297,135 tons, or a loss for this month of 995,475 tons. The increase in business is going to the non-union fields.

"We have waited for the return of the 'prosperity' predicted by you. We are now convinced that it is not forthcoming. Due to the winter demand for coal the production in the country has increased to well over 10,000,000 tons per week. The increased tonnage of coal has been produced in the non-union fields rather than in the union fields. Central Pennsylvania's position as a producer of coal remains practically the same today as it was when the country was producing but 7,000,000 tons per week. This loss of production to central Pennsylvania is due to the high cost of production in our district under the present wage scale. Our competitors have a much lower wage scale, hence are securing the business.

#### Place Blame on Union

"The responsibility for the further strangulation of the coal business rests with your organization. It can be seen in the idle mines, in the desolate towns, and in the migration of hundreds and hundreds of union miners to other industries and non-union fields.

"We speak with frankness and expect action upon your part based upon reason and a desire to co-operate in the successful conduct of the industry. When conditions during the period of an agreement required changing to meet the necessities of your people, the operators of central Pennsylvania have granted you concessions in increased wages. We believe that in relieving such situations upon your requests and upon your demands during a period when you were bound to work for an extended period of time upon a fixed and lower wage scale than we conceded to you during such period, it fixes upon the United Mine Workers a responsibility to recognize the present condition in our industry and to help restore central Pennsylvania to her proper place as a producer of coal.

"We respectfully suggest that this year's business for the union miner and union operator is closed. Coal contracts have been made for the year's business. Spot market winter supply has been provided. Do you want to carry the present year's experience into another year's business of the industry in central Pennsylvania? What suggestions have you to make to relieve the union miner, the union coal operator and the business interests of the communities in which we reside, and to secure their future happiness and prosperity? This communication has been simultaneously submitted to you and the press because of the deep interest the public has manifested in the present condition.

"We respectfully request a reply from your district executive body to this communication."



## Speculation on Cabinet Elicits Mention of Lewis As Secretary of Labor

Great interest is being manifested in Washington in the action which President Coolidge may take in connection with the Interior portfolio. This department of the federal government has been much in the limelight during the past two years. Its reorganization along lines which would require legislation has been urged strongly, but the legislation has not been forthcoming. Some are of the opinion that the effectiveness of the department can be increased greatly without legislation through internal reorganization. In that connection the suggestion has been made that this reorganization should be entrusted to Herbert Hoover. It is argued that he has reorganized the Department of Commerce and has it running so smoothly that its direction relatively has become a matter of routine.

Despite all of the speculation which is going the rounds, it is probable that the President is giving little thought to the personnel of the new Cabinet. It is recognized as one of the most disagreeable tasks which a President must perform. It is not unusual for literally hundreds of names to be suggested for each position. Only one can be chosen, which usually results in disappointment and ill-feeling on the part of many of the friends of the others.

In so far as the Interior Department is concerned there is no definite information as to the desire of Dr. Work to continue and no intimation has come from the White House that a change will be made. The name of Frank W. Mondell has been mentioned for this place. He is one of the wheel-horses of the Republican party, but the probabilities are that his conception of conservation would preclude his selection for that post.

An appointment is expected in the near future to fill the vacancy created by the death of Secretary Wallace. President Coolidge departed somewhat from custom when he asked the farm organizations to submit indorsements for the agricultural ministry. As this is written the President has before him thirty names. Each day is expected to see a lengthening of the list.

All agree that Secretaries Hughes, Mellon, Hoover and Stone will be urged to remain in the Cabinet. There is reason to believe, however, that Mr. Hughes and Mr. Stone would like to resume their law practices. The probabilities indicate, however, that their retirement will not come on March 4, although they may not serve out the full four years of the coming term. Secretary Hoover is known to have determined to devote the remainder of his life to public service. It is generally believed in Washington that he will continue in the Cabinet. Secretary Mellon is not the type that is impervious to the flood of attacks of a political and frequently of a demagogic character. Many of the thrusts in his direction got beneath the skin. His tax plan was defeated and many think it



Senator F. M. Sackett

Kentucky elected a real coal man last week as U. S. Senator for the next four years, when Fred M. Sackett, of the Sackett-Speed interests, of Louisville, defeated Senator A. O. Stanley by about 20,000 votes. The Sackett-Speed interests operate three big mines in eastern Kentucky and one in western Kentucky, also the Byrne & Speed Coal Corporation, retailers and jobbers, of Louisville. Mr. Sackett, who is about 55 years of age, was born in Providence, R. I. He studied law and practiced at Columbus, Ohio, Cincinnati, and later at Louisville, where he became president of the Louisville Gas Co., now a part of the Louisville Gas & Electric Co., one of the Byllesby interests. He has served three terms as president of the Louisville Board of Trade.

will be defeated again if it is presented to the new Congress. This, along with the fact that he is not a robust man, is expected to cause him to retire.

There is much talk of John L. Lewis as a possible selection for the secretaryship of labor. Since the Secretary of Labor is the representatives of all labor, union and non-union, some objection might come from workers outside the union as to the ability of Mr. Lewis to be their real friend at court.

Secretary Weeks has done such a good job in the War Department and it is so evident that he is happy in this work that a change in that department is thought to be very unlikely. Secretary Wilbur is the President's own choice. He was induced to leave the bench of the Supreme Court of California to take the navy secretaryship. It is not likely that he will be changed unless a judicial post should open which appeals more to him.

A change of Postmaster General is expected by many.

## Third Kanawha Company Signs Union Pact

The Bib Bottom Coal Co., which operates on Campbell's Creek in the Kanawha field of West Virginia, has signed an agreement with the union. The company expects to resume operations immediately. The Bib Bottom company is the third company in the Kanawha field to sign the union agreement since the mines which formerly had been working on a union basis in the Kanawha field closed down on April 1.

## Atwater Obtains Control of Mill Creek Company

Wm. C. Atwater, president of Wm. C. Atwater & Co., 1 Broadway, New York City, has confirmed the report that he has acquired the Cooper interests of 60 per cent of the capital stock of the Mill Creek Coal & Coke Co., located at Coopers, McDowell County, W. Va., in the heart of the Pocahontas field. The Mill Creek company has an annual output of a quarter of a million tons. The reported price paid for this interest is \$3,000,000. Mr. Atwater already controls the American Coal Co., the Elkhorn Coal & Coke Co., the Fall River Coal Co. and the Williams Coal Co., all located in the Pocahontas district, and with the purchase of the Mill Creek company he becomes one of the controlling factors in the smokeless fields of West Virginia.

The Mill Creek Coal & Coke Co. is one of the few companies in the Pocahontas field that still makes coke in beehive ovens and there are fifty-five ovens on the property that have burned coke continuously for thirty-six years. This mine was the first mine to ship coal in the West Virginia side of the Pocahontas district. There are eight million tons of coal 9 ft. thick left in the property to be mined out.

Mill Creek mines were opened up by the late John Cooper forty years ago and the first carload of coal was shipped Nov. 4, 1884, the day that Grover Cleveland was first elected President of the United States. Mr. Atwater can well remember Mr. Cooper telling him twenty-five years ago of his shipping the car of coal and then together with the late Jenkin Jones, another old pioneer operator in the Pocahontas district, riding horseback to Princeton, the county seat, to vote and when they called for a Republican ballot found there was none to be had.

Mr. Atwater is president of the Pocahontas Operators Association and is regarded by business associates as one of the most progressive coal operators in the country. He became president of the Mill Creek company on Tuesday.

## Fuel Consumption and Power Output by Utilities Up

Electric public utility plants consumed 3,010,901 net tons of coal during September, according to a report by the U. S. Geological Survey. This compares with 3,015,797 tons consumed in August, according to revised figures. Fuel oil consumed by utility plants during September totaled 1,389,780 barrels, compared with 1,498,769 barrels consumed in August. As September was a 30-day month the daily consumption was greater in the latter month, despite the larger totals for August.

The average daily production of electricity by public-utility power plants during September was 160,200,000 kw.-hr., which is almost 5 per cent greater than the daily output during August and 6 per cent greater than for September a year ago.



## Inspection Tour of Magnates Deepens Interest in Hard-Coal Merger

Twenty Industrial and Financial Leaders Guests of Hudson and Glen Alden Officials at Marvine and Baker Breakers—Only an Educational Trip, Says Loree

A score of the country's foremost business and industrial leaders, including railroad presidents, bank presidents, captains of industry and financial magnates, all of whom are members of the National Industrial Conference Board, were in Scranton, Pa., last Friday, when they inspected the Baker breaker of the Glen Alden Coal Co. and the Marvine breaker of the Hudson Coal Co., the most modern preparation plants in the anthracite field.

The visit occasioned much comment in view of the reports of a contemplated merger of big coal producing-companies, including the Glen Alden, Erie (Pennsylvania) and Hudson Coal Co. properties. On the surface, however, the visit had no bearing on such a move. It was merely a semi-pleasure and educational trip, or as L. F. Loree, president of the Delaware & Hudson railroad, stated, "A sort of Rotary Club educational trip."

### Financial Leaders in the Party

The party included the following: Edward F. Loomis, New York City, president of the Lehigh Valley R.R.; L. F. Loree, New York City, president of the Delaware & Hudson R.R.; J. T. Loree, Albany, N. Y., vice-president of the Delaware & Hudson R.R.; S. D. Warriner, Philadelphia, president of the Lehigh Coal & Navigation Co.; William H. Williams, New York City, vice-president of the Hudson Coal Co.; Walter E. Frew, New York City, president of the Corn Exchange Bank; Loyall A. Osborne, New York City, president of the Westinghouse International Electric Co.; Herman H. Westinghouse, New York City, chairman of the Westinghouse Air Brake Co.; George M. Verity, Middletown, Ohio, president of the American Rolling Mill Co.; Guy E. Tripp, New York City, chairman of the Westinghouse Electric & Mfg. Co.; William H. Nichols, New York City, chairman of the Allied Chemical & Dye Corporation; William H. Nichols, Jr., New York City, president of the General Chemical Co.; Herbert F. Perkins, Chicago, Ill., first vice-president of the International Harvester Co.; Herbert H. Rice, Detroit, Mich., president of the Cadillac Motor Car Co.; Dr. John J. Moorhead, New York City, professor of surgery, Post-Graduate Medical School and Hospital; A. H. Harris, New York City, chairman finance committee and vice-president of the New York Central R.R.; John Henry Hammond, New York City, of Brown Brothers & Co.; Archibald R. Graustein, New York City, president of the International Paper Co.; Frederick A. Geier, Cincinnati, Ohio, president of the Cincinnati Milling Machine Co.; Thomas E. Donnelley, Chicago, Ill., president, R. R. Donnelley & Sons Co.; Philip T. Dodge, New York City, chairman, International Paper Co.; William Butterworth, Moline, Ill., president

Deere & Co.; W. L. Clause, Pittsburgh, Pa., chairman of the Pittsburgh Plate Glass Co.; Ernest R. Behrend, Erie, Pa., president of the Hammermill Paper Co.; and Magnus W. Alexander, New York City, managing director, National Industrial Conference Board.

The visitors were the guests of A. M. Fine, vice-president of the Hudson Coal Co., and W. W. Inglis, president of the Glen Alden Coal Co.; who were assisted by H. M. Warren, electrical engineer, and S. D. Dimmick, vice-president and general manager, of the Glen Alden Co., and R. F. Buchanan, general manager of the Hudson company.

Both breakers were especially prepared for the reception of the magnates, placards explaining the use and capacity of each distinct piece of machinery. The tour of inspection started at the Marvine shaft and after the visitors had seen the freshly mined coal dumped on a conveyor line they followed the fuel through all stages of preparation. The conveyor, a 48-in. rubber belt, in two endless sections, each 550 ft. long, moved with its load at the rate of 300 ft. a minute to the top of the breaker. The belt carries 1,800 tons of coal a day. The visitors then followed the course of the coal from the top of the breaker through the chutes, jigs, shakers and separators into the coal pockets. The cleanliness of the surroundings elicited much comment.

## Gasoline Price Dependent On Coal, Says Teagle

Gasoline prices will be regulated by the market price for coal, according to Walter C. Teagle, president of the Standard Oil Co. of New Jersey, in a statement made public at Tulsa, Okla., recently. He based his prediction on an analysis of the petroleum situation by the company.

Under existing conditions gasoline can be obtained from fuel oil in many instances at a cost lower than it can be obtained from crude petroleum, Mr. Teagle said. "Fuel oil is sold in direct competition with coal," he said. "The reserves of coal are greater and more certain than reserves of petroleum and the price of coal so affects the price of fuel oil that gasoline is affected in proportion."

"Whenever gasoline can be obtained from fuel oil at a cost lower than the natural gasoline in the crude the tendency will be toward a reduction in the available quantity of fuel oil and an increase in the available amount of gasoline. A contraction in the supply of fuel oil will tend to enhance its value, whereas an increase in the quantity of gasoline will have the reverse tendency."

"When there is an overproduction of crude it is necessary for the industry to sell petroleum in the form of fuel oil in competition with coal and the consumers of gasoline will participate in the lower value so established."

## Coal-Mine Fatalities, 1920-22, by Countries\*

Country	Deaths Per 1,000 persons employed			Deaths Per 1,000,000 gross tons of coal raised		
	1920	1921	1922	1920	1921	1922
<i>British Empire</i>						
United Kingdom.....	0.88	0.66†	0.95†	4.81	4.63	4.43‡
Union of S. Africa.....						
Transvaal.....	2.37	1.42	1.98	5.07	3.43	4.66
Cape.....						
Orange Free State.....	4.35	4.08	4.27	10.60	10.13	10.89
Natal.....	2.71	2.07	3.41	9.26	7.99	11.89
Union.....	2.65	1.87	2.81	6.79	5.41	7.91
<i>Canada</i>						
Nova Scotia§.....	2.30	2.36	1.55	4.57	5.40	4.09
Alberta.....	2.99	2.10	4.10	4.20	3.54	6.56
British Columbia.....	2.68	1.45	4.67	6.30	3.89	12.01
India  .....	0.98	1.35	1.13	10.07	13.99	11.50
<i>Australia</i>						
New South Wales.....	1.00	0.89	0.55	1.86	1.75	1.18
Victoria.....	0.50	2.51		1.65	8.42	
Queensland.....	0.85	29.20	2.05	1.80	80.65	5.22
W. Australia.....		1.15	1.34		2.13	2.28
Tasmania.....						
Commonwealth.....	0.91	3.78	0.67	1.77	7.90	1.46
New Zealand.....	0.24	2.29	1.32	0.54	5.53	3.23
<i>Foreign Countries</i>						
Austria.....	0.94	1.47	0.99	8.00	12.43	7.79
Belgium.....	1.13	0.89	0.93	8.22	6.82	6.80
France¶.....	0.97	0.93	**	8.09	7.19	**
Germany						
Prussia.....	2.20	**	**	8.46	**	**
Saxony.....	1.43	2.53	**	6.43	11.05	**
Greece.....	0.87	0.57	**	10.29	6.03	**
Italy.....	1.07	0.89	1.30	12.27	12.45	11.82
Netherlands.....	1.08	1.21	1.03	4.98	7.79	5.75
Spain.....	1.69	1.32	1.33	19.74	14.06	13.86
Algeria.....			**			**
<i>United States</i>						
Actual.....	2.89	2.41	2.32	3.86	4.39	4.80
Reduced to 300-day basis.....	3.78	4.19	**			
Chile.....	2.61	1.80	1.69	32.50	23.11	23.64

\*From the Mineral Industry of the British Empire and Foreign Countries—Statistics, 1920-1922 (Coal, Coke and Byproducts), published by the Imperial Mineral Resources Bureau. †When adjustment is made for stoppage of work, rate = 0.88. ‡Great Britain only. §Year ended September 30. ||Mines under Indian Mines Act only. ¶Excluding Saar. \*\*Information not available.



## Blue Diamond Coal Co. Buys Old First Creek Mine

The first progress the Jewett, Bigelow & Brooks receivers have made in the disposal of any of the eight coal mining companies held in the group of that defunct concern was the sale on Nov. 6 of the old mine of the First Creek Mining Co. in the Hazard district to the Blue Diamond Coal Co., of Knoxville, Tenn., for \$100,000. The public sales in four localities the previous week at which the various properties were put on the block resulted in nothing. Few bids were offered and these were so low that the receivers got permission from Judge Cochran in the federal court at Covington, Ky., Nov. 6 to reject them all. An offer had been made of \$43,000 on the First Creek mine and \$27,500 for the Black Joe mine, in the same region.

The Hazard Jellicoe Coal Co. mine, the third of the J. B. B. mines of the Hazard field, is likely to revert to the Harvey Coal Co. This company is expected to lease it to some operating company soon in case no sale is completed. It is the largest J. B. B. mine in the Hazard field and it was announced that no bids for it under \$380,000 would be considered at the public sale. No bids for it were made at the time.

The public sales also failed to dispose of the J. B. Elkhorn Coal Co. and the J. B. Elkhorn Land Co., in the Elkhorn field; the Harlan Fox Coal Co., in the Harlan field, and the three Bell County properties, which are the J. B. Straight Creek Mining Co., the Roth Coal Co. and the Jaybee Jellicoe Coal Co.

## More Hot Shot for Union In West Kentucky

Some more hot shot have been fired into the remnant of organization of the United Mine Workers which is keeping a small part of western Kentucky tied up by strike. More public correspondence between District Attorney W. O. Smith, a former district president, and Wes Ames, the incumbent, has been released. Smith is trying to get Ames to sign an agreement with operators at a reduced scale in order to save the union from destruction. Ames asserts that Smith is disloyal to unionism but Smith invites attention to Ames' illogical position in part thus:

"Probably the miners of this coal field are not acquainted with the fact that you and practically every one of the principal officers of your district organization during the joint conference in Louisville in the month of April openly and strongly advocated a reduction in wages as being the only hope and salvation of your district organization.

"No doubt the miners of this coal field are not aware of the fact that you and your district secretary-treasurer and a number of other officers went to Indianapolis with the avowed purpose of asking the international officers to permit you to make a contract with the coal operators of this district carrying with it a 20 per cent reduction in wages.

"I am sure they do not know that

## Brotherhood Mines Now Running Non-Union

Although Warren S. Stone, head of the Coal River Collieries Co., which is the Brotherhood of Railroad Engineers' coal company, with four mines in West Virginia and Kentucky, told John L. Lewis, president of the United Mine Workers, that he did not want to run non-union, he is now doing so. The recent refusal of the miners' union to permit a cut in wages so that the railroad union could run its mines has driven Stone to action. He couldn't let his mines stay down forever. Mines Nos. 1 and 2, on Lick Creek, are still idle, but Mines Nos. 3 and 4, on Laurel Fork, are both operating non-union on the 1917 scale. The brotherhood company has evicted a number of union non-working miners and their families from company houses, which naturally wins much sweet and friendly comment from the miners' union.

after the St. Bernard Mining Co. had withdrawn from that conference and declared its intention no longer to deal with the United Mine Workers, you, Herman Vincent and ex-president Lonnie Jackson tentatively agreed among yourselves to ask Frank Rash, an officer of the St. Bernard Mining Co., to come back into the conference and agree again to treat with your organization upon the condition that you would agree to a 20 per cent reduction in wages, and that you were so indifferent and unconcerned at that critical period in your wage negotiations that after Mr. Rash had agreed to come back you let the golden opportunity to save and perpetuate your organization in the Hopkins County coal field slip by, refusing to carry out the suggested agreement with Mr. Rash."

Smith points out cases of suffering among western Kentucky miners and their families—wives pawning their wedding rings, miners selling \$75 milk cows for \$10, children barefoot in the frosty air, and men in the union begging—all because of bullheadedness on the part of union officials.

## New Haven R.R. Seeks Bids

J. F. Manning, fuel agent for the New York, New Haven & Hartford R.R., will receive bids until noon on Nov. 17 for delivering alongside the discharging plant at South Boston, Mass., between 360,000 and 410,000 net tons of high-volatile run-of-mine bituminous coal, in substantially equal monthly quantities between May 1, 1925, and May 1, 1926.

Coal traffic west bound through the canals at Sault Ste. Marie during October, according to the monthly report of the Corps of Engineers, U. S. Army, consisted of 1,643,308 net tons of bituminous and 57,850 net tons of anthracite. Of this, 8,733 tons of soft coal passed through the Canadian canal, the remainder going by way of the American canal.

## Grand Jury in Utah Indicts Promoters of Great Western Coal Co.

A mild sensation was caused at Salt Lake City, Utah, last week when it became known that the federal Grand Jury had indicted George A. Storrs, former warden of the State Prison and a leader in political and financial circles of the state, together with Joseph S. Welch, Earl J. Welch and Charles M. Croft on a charge of conspiring to defraud and with using the mails for that purpose in connection with their promotion of the Great Western Coal Mines Co.

The company recently became a mutual and was one of the best known of the many recent coal mining concerns to attempt to enter the field on the mutual plan. Among the witnesses called before the grand jury were members of the State Securities Commission, which had at different times authorized the company to sell stocks and bonds in the state. The Secretary of State and the Attorney General also were called. Each defendant has been released on a \$1,000 bond and the case is expected to come up for trial at an early date.

The indictments are based on charges that securities of the Great Western Coal Mines Co. were sold by misrepresenting the assets and intentions of the company. In support of the charges letters and documents were presented in an effort to show that money raised from prospective stockholders and bondholders was actually diverted, in whole or in part, to the payment of personal obligations of the individuals indicted. It is said the indictment terminated an investigation of nearly two years on the part of federal agents.

It is alleged that the men were taking money from the public for the development of assets which did not exist. It is stated in the charge that they never owned more than nine acres of coal land in the Gordon Creek region of Carbon County, where the property was situated, or in any other place.

Thomas Yates, secretary of the company, said the indictment will have no effect on the present organization of the company, and refers only to the pre-organization sales campaign. He sets forth a list of the property owned by concern and said they would be actually shipping coal this month.

The indictment appears to be against the officials and not an attack on the company as a business unit. H. C. Hicks, secretary to the securities commission, told a *Coal Age* correspondent. Mr. Hicks said the company was not originally classed as a mutual but its last application to sell stock, which was refused, would have placed it on a mutual basis.

Mr. Storrs, president of the company, is a former superintendent of the Spring Canyon Coal Co. and a former Sheriff of Carbon County. Storrs, the well known coal camp in Carbon County, was named in his honor. The Welches also are well known in Western coal mining circles.



## Coal Producers Jubilant at Outcome Of Presidential Election

Glad to Escape Democratic Regulation and Nationalization Theories of La Follette—Remedy for Overproduction Hoped For—Removal of Uncertainty on Trade Association Activities Expected

BY PAUL WOOTON

Washington Correspondent of *Coal Age*

Producers of coal are more than pleased by the outcome of the presidential election—they are jubilant. Ordinarily there are more Democrats among coal operators than among those in charge of many manufacturing industries, because none of them is influenced by the need of protective tariffs for his product. In this particular campaign, however, there were unusual reasons why coal operators gave their support to the Republican ticket, despite the fact that the Democratic standard bearer had served the industry in an important way in a legal capacity.

The resolutions committee at the Democratic National Convention allowed itself to be influenced by New England—a section which has much to say in convention but which furnishes the party no electoral votes—to insert in the platform a pledge “to regulate by governmental agencies the anthracite coal industry and all other corporations controlling the necessities of life.” While bituminous coal was not mentioned specifically, it was recognized that it is a necessity of life and was included in the platform declaration just as surely as if it had been mentioned specifically. As a matter of fact, all coal was included in the paragraph until Harry L. Gandy, secretary of the National Coal Association, persuaded Senator Walsh of Massachusetts that there could be no more justification for the mention of bituminous coal than any other commodity necessary to life.

### Demand for Individual Initiative

While that paragraph in the Democratic platform was enough to lose to the party all support from the coal industry, the principal reason for the general support given the Republican ticket was the vigorous stand of the party against the nationalization theories of Senator La Follette. As a matter of fact the best political analysts agree that the chief reason for the Republican landslide was the determination of the American people to stay “on the road of individual initiative, enterprise and opportunity along which American institutions so far have progressed,” to use Secretary Hoover’s phrasing.

As in Great Britain, the American public, in view of the Russian experiment, was glad to have an opportunity to demonstrate conclusively that it has no intention of turning into the road “which leads through nationalization of utilities to the ultimate absorption into government of all industry and of all labor.” Full advantage was taken of the opportunity to crush any tendency to put more government in business.

The election of the Republican ticket is regarded as the answer to the plea of the coal industry to be let alone, recently so effectively voiced by S. Pem-

berton Hutchinson, president of the National Coal Association, in his speech before the American Mining Congress. The danger of regulatory legislation has been swept away by the proved popularity of the Republican position on this major point.

### No Government Meddling

There is another important promise to the coal industry in the re-election of the Republican administration. It is preparing to take a definite step to free the oil industry of the great evil of overproduction. The interest which the coal industry has in that constructive effort has been pointed out previously in this correspondence. If it is in the public interest to stop overproduction in oil it would be in the public interest to encourage some plan which would prevent it in coal. While the details of the plan have not been announced, it is safe to say that the party will be consistent with the attitude it assumed during the campaign and not inject government meddling into business on the excuse of curtailing overproduction. In fact, it is known definitely that the plan as it refers to petroleum contemplates only sympathetic co-operation in a movement which will be directed by the industry itself.

Because of the way in which the people have spoken and because of the well established policies of the administration, the coal industry has little reason to anticipate regulatory legislation. There is going to be no attempt to shackle business with new restrictions. The administration’s policy is clearly revealed as being one looking to the fostering of business growth by allowing it the utmost freedom. For that reason it is logical to suppose that it will hasten to remove the uncertainty hanging over trade association activities. Of great importance to business in general is the fact that the two vacancies about to occur through the resignation of justices of the Supreme Court will be filled by a President who is certain to name to that all-important body men of proved conservatism and soundness.

Apparently the new administration is going to have enough backing in each house of Congress to carry through its legislative program. This augurs well for the coal industry and other industries, which will be benefited by a program of constructive legislation which will include tax reduction. Even in the matter of foreign relations definite progress may be expected. With the passing from the scene of the leaders in the League of Nations controversy bitterness is disappearing and a policy probably will be adopted which will be in the interest of world stability. The nomination of General Dawes as the Vice-Presidential candidate meant that

### Three-Cylinder Engine For Coal Service

The Louisville & Nashville R.R., Louisville, has just received a new three-cylinder type of locomotive, the first of its kind south of the Ohio and the fourth in the United States, made by the American Locomotive Co., which is testing out this new type of locomotive, which is said to have a considerably increased drawbar tractive power or pull, due to the third cylinder keeping heavy loads pulling steadily, without the intermission in power, as is the case with the two-cylinder locomotive, especially in hilly country. The new engine weighs 334,000 lb. exclusive of tender, and will be used between Corbin, Ky., and Louisville, in bringing up heavy coal and freight trains from southeastern Kentucky.

the Republican Party at that time had underwritten the Dawes plan. To the signature of the Republican Party now has been added the signature of the American people. Moral backing, as well as financial support, now is pledged to this particular project for the restoration of Europe. Instability abroad for five years has militated against the stability of business in this country. The Dawes plan promises prompt relief from that situation. As a result of all of this planning by business becomes possible as has not been the case for a decade.

### Farley Succeeds Birmingham As D. L. & W. Coal Head

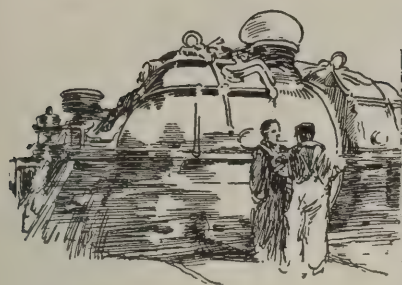
Announcement on Nov. 6 that John F. Birmingham had resigned as president of the Delaware, Lackawanna & Western Coal Co. had been discounted considerably by rumors during the past several weeks that such action was contemplated. Recently Mr. Birmingham had resigned as a director of the Lackawanna Railroad Co. Mr. Birmingham’s successor as president is Elliot Farley, of Boston.

Mr. Birmingham became president of the coal company several years ago, having been promoted to that position from general auditor. He is one of the best known and best informed coal men in the industry. During the World War he took a prominent part in the distribution of coal and served on several federal state and city committees.

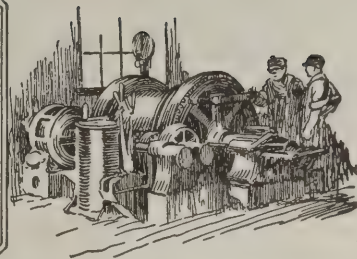
Mr. Birmingham resides at Oyster Bay, Long Island, where he takes a prominent part in civic affairs. He is a director of the Coal & Iron National Bank, New York City; trustee, Dime Savings Bank, Brooklyn; director, North Shore Bank of Oyster Bay, and a director of the State Bank of Sea Cliff, Long Island. He also is an honorary Deputy Police Commissioner of New York City. A brother, L. V. Birmingham, is secretary of the St. George Coal Co., of New York City.

Mr. Farley has taken charge at the New York office but declined to make a statement regarding his plans or policy.





## Practical Pointers For Electrical And Mechanical Men



### Why Waste Money to Place Electric Wires In Underground Conduits?

Overhead Wire Installation Around Mine Is More Economical—Appearance Afforded by Underground Wiring Not Important Consideration—Conduits Above Ground Eliminate Trouble

In the smaller cities where pole lines are used in the business section and where a large number of wires may enter a building, we can readily see why they are placed in underground conduits. Imagine the situation if all wires were carried overhead direct from the crossarm to the most convenient points of entrance through the outside walls! But around a mine, where sometimes no more than two or three wires enter a building from a nearby pole, why do we so often see the conduit brought down the pole, then underground and up through the floor to the switch cabinet or busbars?

This type of installation usually costs much more than the overhead; it is not so reliable and is always more difficult to repair. Generally the only advantage of an underground entrance is that it affords a neater appearance. However, it seems rather inconsistent to sacrifice other more important advantages for appearance alone, especially when we consider that the overhead entrance is still the approved method for city dwellings where neatness is a more important consideration than at the small substation, tippie, fan, or hoist-house of the average mine.

Fig. 1 is a sketch of an actual substation installation. The transformers

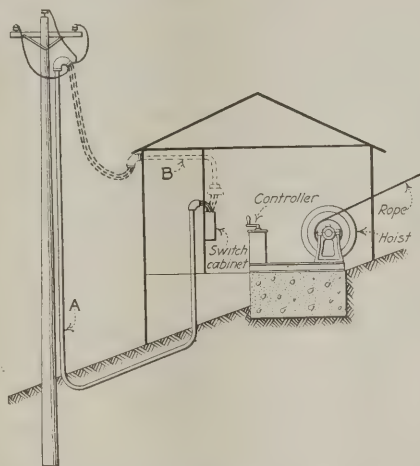


Fig. 2—Conduit from Pole Line

The expense of an underground wiring entrance to this hoisthouse, of cheap frame construction, appears out of place. Had the line been carried overhead it would have been much easier to install it.

are located outside the building in a fenced enclosure, and the 2,200-volt line is brought to a point above the buses through the rigid iron conduit A. A simple, cheap and more reliable method is shown by the dotted position B.

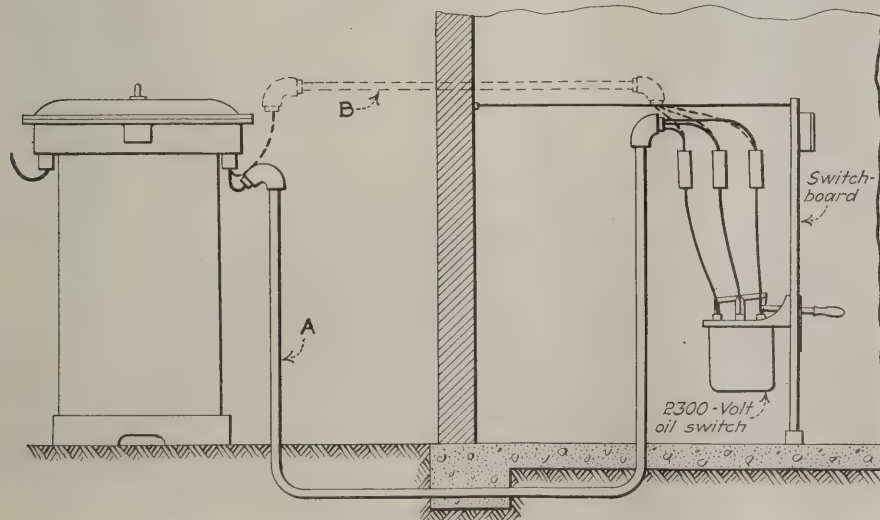


Fig. 1—Conduit Encases Wires from Transformers

The transformers supplying 2,300 volts to this substation are located outside and only a few feet from the building. There would have been no disadvantage in an overhead entrance.

Referring to Fig. 2, we see a sketch of another actual installation. Here an underground conduit is used to bring power into a cheap frame building which houses a small hoist. Fifty feet of 2½-in. conduit, indicated by A, is used. Method B would have required only 8 ft. of conduit and would have saved approximately 120 ft. of wire. Placing the conduit overhead would eliminate the risk of trouble from water which is always liable to enter an underground conduit through poor joints, by holes caused by corrosion or by terminal fittings which are not weatherproof.

### Coil Springs Used as Belts in Graphic Wattmeters

By making a few simple changes to the mechanism of their switchboard-mounted, graphic type, alternating-current wattmeters, R. F. Demi, chief electrician of the Keystone Coal & Coke Co., of Greensburg, Pa., is eliminating those aggravating troubles which formerly were the frequent causes of incomplete or imperfect demand-meter charts.

The meters are of the type in which a small motor, controlled by relay contacts, is used to move the inking pen. One such meter is installed in the main line at each operation. The continuous charts thus obtained are used to guide and stimulate the efforts of the organization toward holding down the 15-min. maximum demand which is an important factor affecting the power bills.

The common troubles encountered were the slipping of the flat leather belt driving the chart re-roll, to the climbing of sprockets by the chain connecting the motor to the pen mechanism, and the opening of circuits in the resistance units.

Both the chart re-roll and pen mechanisms were changed to belt drives using small coil springs as belts. This method, as compared to a leather belt, has the distinct advantage of maintaining a definite tension unaffected by use, time or climatic changes. New grooved pulleys for the re-roll were made in the local shop, but for the pen drive the old sprockets were altered to accommodate the coil-spring belt. This was done in a lathe by turning the teeth nearly off and then cutting a groove in the face. The belts were made by winding fine spring-steel wire on a mandrel about ⅜ in. in diameter.

The compact and rather inaccessible resistance units furnished with the meters were made up of short resist-



ance tubes of graduated size nested one inside the other. To eliminate the difficulties of repairing or replacing these resistance units they were replaced by a group of individual units each screwed into a socket so as to be easily removed for testing or renewal.

### May Easily Damage Meters by Wrong Connections

Portable direct-current millivoltmeters and ammeters are often damaged because many users do not realize the circumstances which cause a burn-out. The necessary practice at the mines of grounding one side of the direct-current line forms a condition which should in itself spell "Caution" to the electrician using shunt-type instruments on mine circuits.

Fig. 1 is schematic diagram of an ammeter and its shunt, connected for

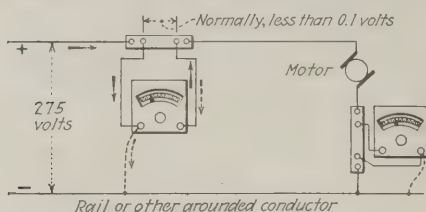


Fig. 1—Lead Drops to Ground

Accidental connection of ammeter leads to ground frequently makes it necessary to send instruments back to the factory for repair.

testing the motor of a mine pump or other inside equipment. The natural tendency is to connect the shunt in the positive conductor as shown by the fine lines. With this arrangement, contact to ground by the shunt and of either instrument lead, will instantly burn the meter winding. This is liable to happen when the meter is being connected or disconnected, or it may be caused by a lead knocked loose from the shunt. The fine dotted line indicates how 275 volts may be thrown on

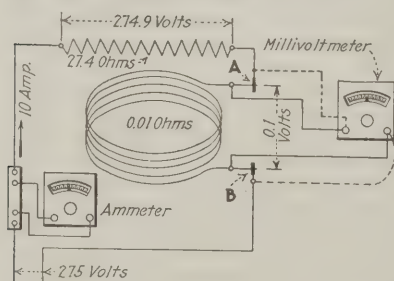


Fig. 2—Millivoltmeter Connection

Loosening of temporary connections made for resistance measurement has been the cause of damage to many low-reading voltmeters. Meter connections should be made independent of, and on the inside, of main connections A and B.

a 0.1-volt capacity instrument by the positive lead touching a rail.

The preferred method of connecting the meter into the negative circuit is shown by the heavy lines of Fig. 1. When this arrangement is used there is practically no chance of the meter being damaged by accidental connection of either of the shunt leads to the ground.

The use of a millivoltmeter or of any low-reading voltmeter for determining the voltage drop across a low-resistance conductor, which has been connected temporarily into a circuit, has many times resulted in damage to the meter. Fig. 2 shows the connection when determining the resistance of a series field coil. If the millivoltmeter leads are connected as in full lines no damage to the instrument will result should the connections A or B (generally rather temporary for such a test) come loose; however if connected as shown by the dotted lines the meter will be burned out. Under the latter condition practically full line voltage is applied to the low-capacity meter.

### Welding Galvanized Iron

The arc of an electrode is so stable that, with it, it is easy to weld galvanized iron. The most of the work to be done with this material consists in making butt welds or edge welds on thin plates, these welds constituting the seams in plates, pipes, etc. Welds are made with a single bead along the seam. The automatic welding machine, which affords great economies, is well fitted for work of this kind. Although hand welding is also employed to advantage, the methods used should be

Plate Thickness in In.	Electrode Diam. in In.	Current Approx. in Amp.	Speed in. per Minute
$\frac{1}{16}$	$\frac{1}{8}$	70-80	40
$\frac{1}{8}$	$\frac{1}{4}$	95-105	24
$\frac{3}{16}$	$\frac{3}{8}$	125-135	20
$\frac{1}{2}$	$\frac{1}{2}$	155-165	12
$\frac{3}{4}$	$\frac{3}{4}$	180-190	10

as nearly as practicable those about to be described below for automatic welding practice.

1. For seam welding, either butt or edge, the edges to be welded should be brought together closely and clamped and held in that position. For butt welding on thin metal, the edges should be clamped against a copper backing strip, to prevent burning through the

metal and to give a smooth seam on the underside of the work.

2. The electrode should be vertical to the work, or point slightly forward in the direction of travel.

3. Suitable sizes of electrode, values of current and speeds of travel along the seam are given in the accompanying table. The speeds are much higher than for ordinary welding. Those given in the table are conservative. Faster speeds may be used in many cases. The speed and the current used in all cases must be adapted to each other, more current being used with higher speed. With too little current for a given speed, slips will occur in the weld, whereas if the current is too great holes will be produced in the seam. The arc voltage recommended is from 14 to 16 volts, depending on the thickness of the work.

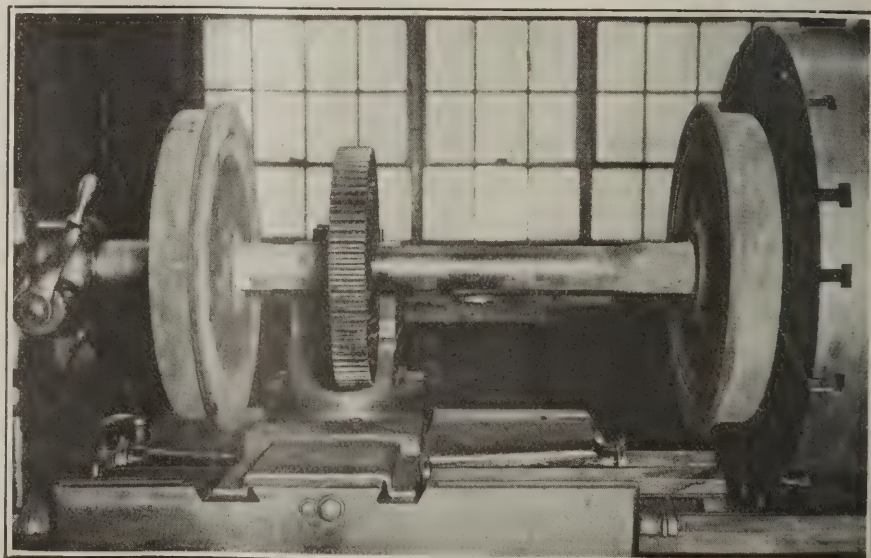
By a little practice with this kind of welding it is possible to train the operator to weld materials which now are being thrown away. Old parts may be built up and machined to size.

### Repairing Locomotive Axles

In spite of careful attention given to the lubricating of locomotive journals, the axles under hard service eventually wear. One of the many jobs that are facilitated by a large lathe, which makes the purchase of this machine a good investment, is the repairing of these worn axles.

Without taking off the wheels and driving gear, the worn journal bearing surface can be built up with an electric welder and then turned down in the manner shown in the accompanying illustration.

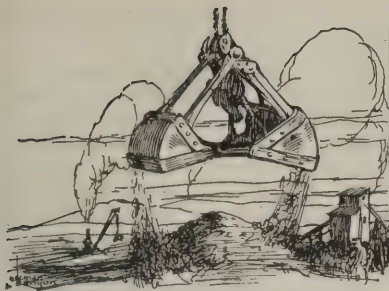
If worn axles are not repaired as described, they must be replaced. The latter job involves no little expense for, aside from the cost of the new axles, much time must be spent in changing and adjusting the spur-gear and wheels. Furthermore, the practice is not recommended because tight and true press fits of the wheels on the axles are not easily made.



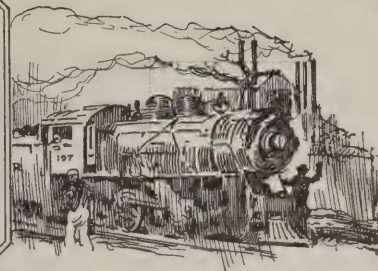
Saving Money by Welding and Turning Worn Axles

It is a simple matter to build out a worn surface on the axle of a mine locomotive and later turn it down on a lathe. If the wheels are pressed off and on an axle whenever a repair must be made the wheels soon become loose.





# Production And the Market



## Halting Tendency Still Pervades Coal Business But Sentiment Is Better

A touch of cold weather in the Middle West last week was all that saved the coal trade from a further general decline, for in practically every other section of the country the demand fell far behind expectations. This was especially marked in Eastern markets and in Ohio, and to a less notable degree in Kentucky, where there is sufficient business in hand to keep the mines going for a while. The undertone is less firm in New England too, despite the fact that there has been a gradual pickup in the textile industry. As usual, the election is blamed in many quarters for the halt in business, though the result had been sized up fairly generally long ago. The consensus is that the outcome will benefit the trade, but insufficient time has elapsed as yet for the observance of any substantial effect. The impending close of navigation on the lakes is a conflicting element that is puzzling the trade, as it will throw such a large tonnage on other markets that the problem of absorbing it may be too difficult for solution. In that event some mines may be forced to close down until they are able to find an outlet for their product.

### General Business Impetus Promised

Business in general is expected to show renewed impetus from now on, according to most authorities, including the Federal Reserve Board, which reports increased production in most lines. Even those in which the gains have not been so marked show healthy conditions, the board states.

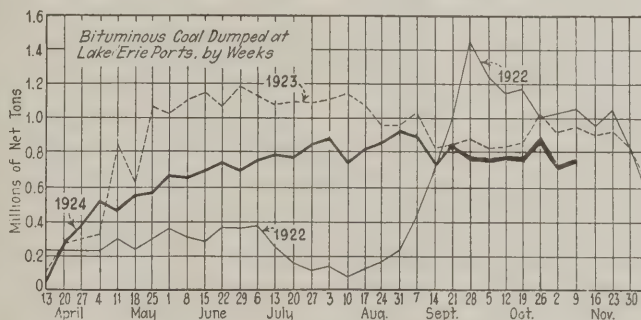
Coal Age Index of spot prices of bituminous coal receded another point last week, standing on Nov. 10 at 170, the corresponding price for which is \$2.06, compared with 171 and \$2.07 respectively on Nov. 3.

There was a further reaction in activity at Hampton Roads last week, dumpings of coal for all accounts during the seven-day period ended Nov. 6 totaling 325,568 net tons, compared with 363,818 tons the week before.

A slight increase in movement up the lakes took place,

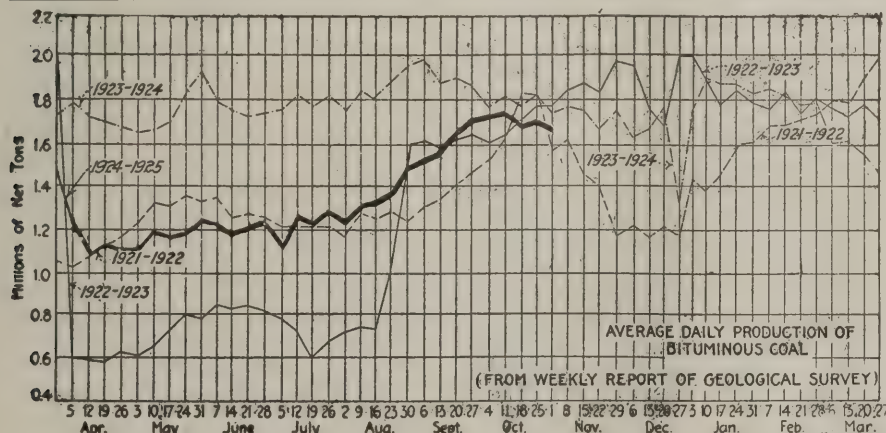
dumpings at Lake Erie ports during the week ended Nov. 9, according to the Ore & Coal Exchange, being as follows: For cargo, 704,538 net tons; for fuel, 30,937 tons, compared with 688,548 and 38,272 tons respectively during the previous week.

Bituminous coal production receded during the week ended Nov. 1, when, according to the Geological Survey, 10,091,000 net tons was produced, compared with 10,300,000 tons during the preceding week, as shown by revised figures. The reduction was due to the partial observance of All Saints' Day as a holiday. In like manner, anthracite output fell away to 1,444,000 net tons, compared with 1,927,000 tons during the week ended Oct. 25. The comparatively larger loss in output



of hard coal was due to the general observance of Mitchell Day (Oct. 29) in addition to the church holiday.

Mild weather is proving a stumbling block to the anthracite trade, demand being slow and independent prices showing a tendency to weaken. With output curtailed, however, the movement has been strong enough to prevent accumulations. Dealers are well supplied with most sizes. Stove leads in demand and nut moves without much difficulty, but pea is in trouble. Rice and barley are the strongest of the steam sizes, buckwheat No. 1 being comparatively weak.



### Estimates of Production

(Net Tons)

#### BITUMINOUS

	1923	1924
Oct. 18.....	10,694,000	10,261,000
Oct. 25 (a).....	10,919,000	10,300,000
Nov. 1 (b).....	10,547,000	10,091,000
Daily average.....	1,758,000	1,682,000
Cal. yr. to date.....	464,825,000	383,553,000
Daily av. to date.....	1,798,000	1,480,000

#### ANTHRACITE

Oct. 18.....	1,978,000	1,750,000
Oct. 25.....	2,001,000	1,927,000
Nov. 1.....	1,328,000	1,444,000
Cal. yr. to date.....	78,821,000	76,134,000

#### COKE

Oct. 25.....	276,000	140,000
Nov. 1 (b).....	266,000	150,000
Cal. yr. to date (c)...	15,874,000	8,161,000

(a) Revised since last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.



## Cool Weather Hits Midwest

The prayed-for cold wave rolled across the Midwest states late last week with a slight stimulation of domestic business, which had been pretty dull for the previous two weeks. However, the weather sharps were not sure the cold would remain long. Not all the domestic coal standing unbilled at mines was moved, but running picked up a trifle during the first two days of cold in anticipation of business. This, of course, slightly increased the output of screenings and did not, therefore, stiffen steam business.

The screenings situation in Illinois and Indiana is not particularly discouraging this week, however. The slowing down of mines lately due to inability to sell lump and egg has reduced the supply. On top of this a good many big buyers have been signing up steam contracts for the rest of the winter. Thus screenings in southern Illinois have been enabled to stand up closely to the circular of \$1.25@ \$1.50, central Illinois has quit selling dollar coal, Indiana Fifth Vein has stepped up to above \$1 and Indiana Fourth Vein is holding its own at \$1.40@ \$1.50.

The election had almost no immediate effect on the coal trade although the wise observers expect a steady but slow improvement in industrial business from now forward. The Midwest region is more directly affected by weather and freight rates than by voting. The new weather is encouraging but the reduction in rates on eastern Kentucky and

other inner crescent coal to the Northwest is distinctly discouraging to Illinois and Indiana. Southern Illinois only recently was hurt by the 28c. rate increase to the Twin Cities, thus giving dock coal an edge over most Midwest output; and now comes the I. C. C. order reducing L. & N. coal 15c. to the Northwest.

Coal business has slumped off at St. Louis. Warm weather had stocked up the yards and there is, very little demand except for a little high grade. There is a further increase in the number of homes that are not buying coal this year, and a survey by some dealers shows that oil-burner competition is growing. This also is affecting the mines, and yet the mines and the dealers are not spending any money to retain the business that they had. Wagonload steam has eased off. Carload steam is slow locally and there is no demand from the country. Country domestic has also fallen off.

## Little Change in Kentucky

Kentucky prices continue fairly steady over the week, no material change being reported in anything. Demand has not been as active as had been expected, but there is enough business in hand to keep mines going for a while.

Southern coal is moving north freely. During October all previous records were smashed on the Louisville & Eastern division of the Louisville & Nashville R.R. out of the

## Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

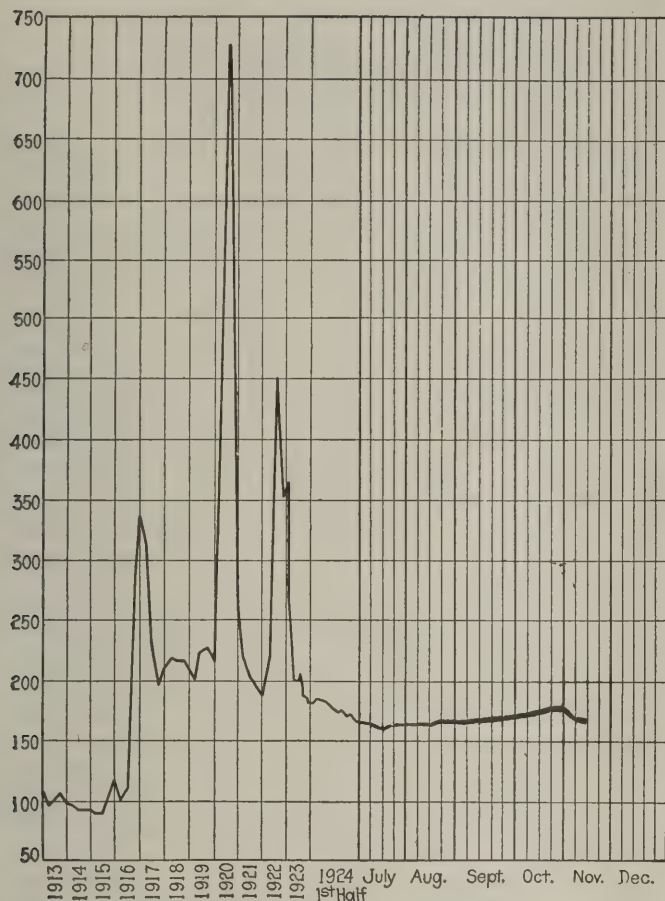
Low-Volatile, Eastern		Market Quoted	Nov. 12 1923	Oct. 27 1924	Nov. 3 1924	Nov. 10 1924†	Midwest		Market Quoted	Nov. 12 1923	Oct. 27 1924	Nov. 3 1924	Nov. 10 1924†
Smokeless lump.....	Columbus.....	\$5.10	\$4.50	\$4.35	\$4.25@	\$4.50	Franklin, Ill. lump.....	Chicago.....	\$4.10	\$3.35	\$3.35	\$3.25@	\$3.50
Smokeless mine run.....	Columbus.....	2.35	2.35	2.25	1.90@	2.25	Franklin, Ill. mine run.....	Chicago.....	2.60	2.35	2.35	2.25@	2.50
Smokeless screenings.....	Columbus.....	1.35	1.30	1.30	1.25@	1.45	Franklin, Ill. screenings.....	Chicago.....	1.45	1.35	1.35	1.25@	1.50
Smokeless lump.....	Chicago.....	5.10	4.60	4.60	4.50@	4.75	Central, Ill. lump.....	Chicago.....	3.10	2.85	2.85	2.75@	3.00
Smokeless mine run.....	Chicago.....	2.25	2.00	1.85	1.75@	2.00	Central, Ill. mine run.....	Chicago.....	2.10	2.20	2.20	2.15@	2.25
Smokeless lump.....	Cincinnati.....	5.50	4.25	4.10	3.75@	4.00	Central, Ill. screenings.....	Chicago.....	1.05	1.15	1.10	1.20@	1.35
Smokeless mine run.....	Cincinnati.....	2.35	2.25	2.00	1.85@	2.00	Ind. 4th Vein lump.....	Chicago.....	3.35	3.10	3.10	3.00@	3.25
Smokeless screenings.....	Cincinnati.....	1.50	1.15	1.15	1.10@	1.25	Ind. 4th Vein mine run.....	Chicago.....	2.60	2.35	2.35	2.25@	2.50
Smokeless mine run.....	Boston.....	4.30	4.45	4.45	4.25@	4.40	Ind. 4th Vein screenings.....	Chicago.....	1.20	1.30	1.30	1.40@	1.50
Clearfield mine run.....	Boston.....	2.15	2.00	1.85	1.65@	2.25	Ind. 5th Vein lump.....	Chicago.....	2.50	2.85	2.85	2.75@	3.00
Cambria mine run.....	Boston.....	2.35	2.40	2.20	2.10@	2.75	Ind. 5th Vein mine run.....	Chicago.....	2.10	2.10	2.10	2.00@	2.25
Somerset mine run.....	Boston.....	3.00	2.15	2.05	1.85@	2.50	Ind. 5th Vein screenings.....	Chicago.....	.80	.95	.95	1.00@	1.25
Pool 1 (Navy Standard).....	New York.....	3.00	2.75	2.75	2.50@	3.00	Mt. Olive lump.....	St. Louis.....	3.10	2.85	3.00	3.00	
Pool 1 (Navy Standard).....	Philadelphia.....	3.00	2.70	2.70	2.50@	2.90	Mt. Olive mine run.....	St. Louis.....	2.25	2.50	2.35	2.25@	2.50
Pool 1 (Navy Standard).....	Baltimore.....	2.25	2.60	2.45	2.10@	2.50	Mt. Olive screenings.....	St. Louis.....	1.00	1.35	1.10	1.00@	1.25
Pool 9 (Super. Low Vol.).....	New York.....	2.25	2.10	2.10	2.00@	2.25	Standard lump.....	St. Louis.....	3.05	2.85	2.75	2.75	
Pool 9 (Super. Low Vol.).....	Philadelphia.....	2.30	2.15	2.15	1.95@	2.35	Standard mine run.....	St. Louis.....	2.05	2.20	1.95	1.90@	2.00
Pool 9 (Super. Low Vol.).....	Baltimore.....	2.05	1.90	1.80	1.65@	1.80	Standard screenings.....	St. Louis.....	.55	.80	.60	.50@	.70
Pool 10 (H.Gr.Low Vol.).....	New York.....	2.00	1.90	1.90	1.75@	2.00	West Ky. lump.....	Louisville.....	3.00	3.10	3.05	3.00@	3.15
Pool 10 (H.Gr.Low Vol.).....	Philadelphia.....	1.85	1.75	1.75	1.65@	1.90	West Ky. mine run.....	Louisville.....	1.65	1.65	1.60	1.50@	1.75
Pool 10 (H.Gr.Low Vol.).....	Baltimore.....	1.90	1.70	1.65	1.60@	1.65	West Ky. screenings.....	Louisville.....	.60	.65	.65	.65@	.75
Pool 11 (Low Vol.).....	New York.....	1.75	1.60	1.65	1.60@	1.75	West Ky. lump.....	Chicago.....	2.85	2.75	2.75	2.50@	3.00
Pool 11 (Low Vol.).....	Philadelphia.....	1.60	1.45	1.45	1.35@	1.60	West Ky. mine run.....	Chicago.....	1.75	1.65	1.65	1.35@	1.95
Pool 11 (Low Vol.).....	Baltimore.....	1.80	1.60	1.55	1.40@	1.50							
High-Volatile, Eastern							South and Southwest						
Pool 54-64 (Gas and St.)..	New York...	1.60	1.55	1.50	1.40@	1.60	Big Seam lump.....	Birmingham..	3.85	3.10	3.10	2.75@	3.50
Pool 54-64 (Gas and St.)..	Philadelphia..	1.60	1.50	1.50	1.40@	1.60	Big Seam mine run.....	Birmingham..	1.95	1.60	1.60	1.50@	1.90
Pool 54-64 (Gas and St.)..	Baltimore.....	1.70	1.50	1.45	1.40@	1.50	Big Seam (washed).....	Birmingham..	2.35	1.85	1.85	1.75@	2.00
Pittsburgh sc'd gas.....	Pittsburgh.....	2.55	2.40	2.40	2.30@	2.50	S. E. Ky. lump.....	Chicago.....	3.25	2.85	2.85	2.75@	3.00
Pittsburgh gas mine run.....	Pittsburgh.....	2.25	2.10	2.10	2.00@	2.25	S. E. Ky. mine run.....	Chicago.....	2.25	1.60	1.60	1.50@	1.75
Pittsburgh mine run (St.)..	Pittsburgh.....	1.90	1.85	1.85	1.75@	2.00	S. E. Ky. lump.....	Louisville.....	3.50	3.25	3.25	3.00@	3.50
Pittsburgh slack (Gas).....	Pittsburgh.....	1.05	1.20	1.20	1.10@	1.25	S. E. Ky. mine run.....	Louisville.....	1.85	1.60	1.45	1.50@	1.75
Kanawha lump.....	Columbus.....	3.00	2.55	2.55	2.35@	2.75	S. E. Ky. screenings.....	Louisville.....	.75	.85	.95	.85@	1.00
Kanawha mine run.....	Columbus.....	1.85	1.50	1.55	1.40@	1.75	S. E. Ky. lump.....	Cincinnati.....	3.00	3.10	3.00	2.60@	2.75
Kanawha screenings.....	Columbus.....	.65	1.00	.95	.90@	1.10	S. E. Ky. mine run.....	Cincinnati.....	1.50	1.55	1.55	1.25@	1.65
W. Va. lump.....	Cincinnati.....	3.10	3.00	2.85	2.60@	2.75	S. E. Ky. screenings.....	Cincinnati.....	.85	1.00	.90	.90@	1.10
W. Va. gas mine run.....	Cincinnati.....	1.50	1.55	1.55	1.40@	1.50	Kansas lump.....	Kansas City..	5.10	5.00	5.00	5.00	
W. Va. steam mine run.....	Cincinnati.....	1.50	1.45	1.45	1.25@	1.35	Kansas mine run.....	Kansas City..	3.50	3.10	3.10	3.25@	3.50
W. Va. screenings.....	Cincinnati.....	.80	.95	.90	.90@	1.00	Kansas screenings.....	Kansas City..	2.25	2.00	2.00	2.00	
Hooking lump.....	Columbus.....	2.90	2.55	2.55	2.40@	2.75	* Gross tons, f.o.b. vessel, Hampton Roads.						
Hooking mine run.....	Columbus.....	1.85	1.55	1.60	1.50@	1.70	† Advance over previous week shown in heavy type, declines in italics.						
Hooking screenings.....	Columbus.....	.70	.90	.75	.65@	.85							
Pitts. No. 8 lump.....	Cleveland.....	2.55	2.40	2.40	1.90@	2.85							
Pitts. No. 8 mine run.....	Cleveland.....	1.90	1.85	1.85	1.75@	1.80							
Pitts. No. 8 screenings.....	Cleveland.....	1.00	1.00	1.00	1.00@	1.05							

## Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

		Freight Rates	Nov. 12, 1923		Nov. 3, 1924		Nov. 10, 1924†	
	Market Quoted		Independent	Company	Independent	Company	Independent	Company
Broken.....	New York.....	\$2.34	\$9.60@	\$10.50	\$8.00@	\$9.25		\$8.00@ \$9.25
Broken.....	Philadelphia.....	2.39				9.15		9.15
Egg.....	New York.....	2.34	9.85@	12.25	8.75@	9.25	\$9.00@ \$9.75	8.75@ 9.25
Egg.....	Philadelphia.....	2.39	9.85@	12.20	8.75@	9.25	9.25@ 9.75	8.80@ 9.25
Egg.....	Chicago*.....	5.06	9.60@	12.50	8.00@	8.35	8.17@ 8.27	8.14@ 8.20
Stove.....	New York.....	2.34	9.85@	12.25	8.75@	9.25	10.00@ 10.25	8.75@ 9.50
Stove.....	Philadelphia.....	2.39	9.85@	12.20	8.90@	9.25	9.85@ 10.25	9.15@ 9.50
Stove.....	Chicago*.....	5.06	9.60@	12.50	8.00@	8.35	8.63@ 8.75	8.50@ 8.64
Chestnut.....	New York.....	2.34	9.85@	12.25	8.75@	9.25	9.50@ 10.25	8.75@ 9.25
Chestnut.....	Philadelphia.....	2.39	9.85@	12.20	8.90@	9.25	9.65@ 10.00	9.15@ 9.25
Chestnut.....	Chicago*.....	5.06	9.60@	12.50	8.00@	8.35	8.26@ 8.40	8.44@ 8.60
Pea.....	New York.....	2.22	6.75@	8.25	6.15@	6.65	5.00@ 5.50	5.50@ 6.00
Pea.....	Philadelphia.....	2.14	6.75@	9.00	6.35@	6.60	5.75@ 6.35	5.75@ 6.00
Pea.....	Chicago*.....	4.79	6.00@	6.75	5.40@	6.05	5.13@ 5.45	5.36@ 6.20
Buckwheat No. 1.....	New York.....	2.22	2.00@	3.00	3.50		2.25@ 2.75	3.00@ 3.15
Buckwheat No. 1.....	Philadelphia.....	2.14	2.25@	3.50	3.50		2.50@ 3.00	3.00
Rice.....	New York.....	2.22	1.50@	2.00	2.50		1.80@ 2.15	2.00@ 2.25
Rice.....	Philadelphia.....	2.14	1.75@	2.50	2.50		2.00@ 2.25	2.25
Barley.....	New York.....	2.22	1.00@	1.25	1.50		1.25@ 1.50	1.50
Barley.....	Philadelphia.....	2.14	1.00@	1.50	1.50		1.50	1.50
Birdseye.....	New York.....	2.22	1.45		1.60	1.35@	1.60	1.35@ 1.60

\* Net tons, f.o.b. mines. † Advance over previous week shown in heavy type, declines in italics.





Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

	1924		1923	
	Nov. 10	Nov. 3	Oct. 27	Nov. 12
Index .....	170	171	176	184
Weighted average price.....	\$2.06	\$2.07	\$2.12	\$2.23

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke; 1913-1918," published by the Geological Survey and the War Industries Board.

Hazard and Elkhorn districts, while the total coal car loadings for the entire system were smashed during October, the road having handled heavy tonnage from all fields.

Prices are \$3@3.25 for best block in both eastern and western Kentucky, with some eastern quoted at as high as \$3.50, but without much new business booked at over \$3.25. Screenings in western Kentucky are a shade firmer at 65@75c. a ton, while eastern starts at 85c. and goes to \$1, with just a little tonnage quoted at \$1.05@1.10.

Mine run has been moving very slowly in view of the fact that screenings are in good supply, and at low prices. Even nut sizes are low as a result of considerable screening of nut, western Kentucky quoting small nut as low as \$1.60, with big nut at \$2.10, and eastern Kentucky, producing nut in only a very few mines, is quoting \$1.75@2. Western Kentucky is asking \$2.50@2.75 on egg and \$2.75@3 on lump, while eastern is asking \$2.25@2.50 on egg, and \$2.25@2.75 on lump.

### Northwest Feels Better

A feeling of distinct optimism pervades the coal trade circles at the Head-of-the-Lakes as a result of the presidential election. Dealers are looking forward to an improving demand for steam and gas coal to set in almost immediately from industrial quarters. Colder weather during the last ten days also is contributing to good inquiry from retailers over the Northwest, who are at present carrying limited supplies. A feature on the market was the speeding up of inquiry for Pocahontas prepared. That led to another advance of 50c. to \$8.50 as compared with \$7 early last month.

Receipts at Duluth and Superior docks during October

aggregated 1,196,833 tons, including 1,151,086 of bituminous and 45,748 of anthracite. That brought receipts of bituminous as of Nov. 1 to 6,362,663 tons and of anthracite 1,177,271 tons. Top figures for the year were set in shipments from the docks over the Northwest during October, the aggregate being reported at 26,418 cars as compared with 24,373 cars during September and 23,436 cars during October last year.

Coal is coming to the Milwaukee docks quite freely, but demand is faint. After a slight flurry due to an ominous drop in temperature the flow of orders waned with the recovery of the mercury. Dealers say everything depends upon the weather, which has been unseasonably warm. October receipts of coal by lake—cargo and car ferry—were larger than the receipts of any other month in 1924. Cargo totaled 120,640 tons of anthracite and 423,064 tons of bituminous coal, or 543,704 tons in all. Cargo totals for the season to Nov. 5 are 693,294 tons of anthracite and 2,130,474 tons of bituminous coal, or 2,823,768 tons in all, as against 813,824 tons of anthracite and 2,741,963 tons of bituminous coal—3,555,787 tons in all—during the same period in 1923.

At the Twin Cities September and October consumption was only one-fourth of the usual moderate volume that is burned in those months. The deliveries from the docks this fall to this region as compared with last show a loss of 25 per cent. Despite this depressed circumstance, the market position of practically all grades of coals, except screenings, is firm. Dock prices are holding to their list as they have been doing. All-rail coal is firm at the ruling prices, and there seems to be little surplus coal seeking an outlet. Dock prices remain the same as they have been for some time.

### West Needs Cold Too

Continued warm weather has brought the domestic market in the Southwest almost to the vanishing point. A considerable surplus of prepared grades has accumulated at Kansas and Oklahoma mines, although these operations are now averaging only about half time. The curtailment of production has resulted in cleaning up the surplus of screenings. Industrial demand is constant.

Continued warmth throughout the Colorado territory has shown its effect upon the coal business. This is the first time in twenty-two years that Colorado has experienced an October without a snow. Production last week showed a slight pick-up, however, and Colorado mines worked an average of 32 hours. The "no market" hazard is slowly being overcome, as only 20 per cent of the total working time lost was due to this cause. Prices are unchanged.

In Utah the unseasonable weather is reducing production. Working time is not over 50 per cent. Prices remain firm, both wholesale and retail, except that retailers are beginning to cut the price of slack. Industries other than the metals are buying very little coal.

### Ohio Business Sags Some More

Gorged markets to the north in conjunction with balmy weather has caused a further break in prices at Cincinnati, only slack holding its own, urgent buying by lake interests for the last run of the boats north before the close of navigation causing it to advance slightly. Even mine run, which has been only casually affected by the recent upward trend, was forced to back water a little. The domestic sizes have been badly shot. J. A. Morris' figures show that 13,345 cars loaded with coal passed through the gateways last week, only a few cars less than record figures.

Domestic demand at Columbus has turned dull as a result of warm weather. Buying is limited strictly to immediate wants. Retail prices have been rather firm up to a few days ago, when some cutting was reported. Steam trade is rather quiet, as reserves are still sufficient and purchasers are loath to increase them. Demurrage coal is selling on the open market at low prices. Industrial conditions are still unsettled. Lake trade is about over for the season, which is expected to throw a large tonnage of West Virginia screenings on the market which is now going to the lakes. The output in Ohio fields has shown a decline.

Business in the Cleveland market is slower for this time of the year than in many years. Demand is low and run-of-mine prices have softened 10 to 15c. per ton; some odd lots of distress coal from other districts than No. 8 Ohio have sold for even less. Mild weather continues to hold down the domestic trade and steam consumption seems to



be at a minimum, buyers apparently not caring to lay in any sizable quantities.

### Prices at Pittsburgh Withstand Pressure

Demand at Pittsburgh continues dull. There has been no shipping of coal on consignment to any appreciable extent, and thus there has been no "distress" coal, but there is a possibility that consigning of coal will be resorted to. There is no accumulation of loaded coal at mines threatened at present with demurrage. Prices are unchanged.

Demand continues light at Buffalo, as compared with the supply, which means a trade without much in it for the seller or anybody else but the consumer. Some sanguine people believe that the low point has been passed, but it is too soon to say what the election will do. Price quotations have not changed to amount to anything for months; they are still weak. Competition from West Virginia and Kentucky coals continues. The lake trade is dull and apparently about closed for the season. Shipments to November are 2,380,150 tons compared with 2,485,020 tons to the same time last season.

### New England Market Less Firm

In New England there is less indication of firmness than a week ago. The sales agencies seem again to have overreached slightly as to price, and coal has been purchased at from 5@10c. less during the current week. The trade is being made to realize there is as yet nothing in the industrial situation to warrant predictions of more than gradual improvement during the winter months.

At Hampton Roads small accumulations are again heard from. However, output is on a better scale, and it is simply that there are fewer buying orders in the market. Purchases are more spasmodic, and those who felt a fortnight ago like running to cover are now inclined to test the trend of prices and buy only on favorable openings. As usual in such situations there have been cancellations to upset the calculations of producers, and where late in October the latter felt like putting brakes on sales they are inclined now to make small concessions in the interest of a higher average output. Spot cargoes range \$4.25@\$.4.40 per gross ton, f.o.b. vessel for Navy acceptable grades. For prepared coal moving west there appears to be a stable demand.

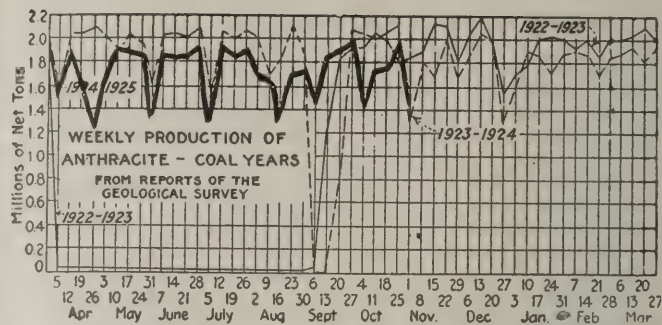
On cars Boston for inland delivery the volume of coal handled has somewhat decreased lately, although prices are reasonably strong at \$5.40@\$.5.50 per gross ton. At Providence and at Portland competition is less acute and factors are able to obtain a more remunerative gross price.

On coals from central Pennsylvania all-rail there is practically nothing more than the staple business for special uses that materializes every year regardless of competition from Southern coals at tidewater. Prices show no material change.

### Atlantic Seaboard Markets Inactive

There is scarcely any activity in the New York market. Buyers show no anxiety when warned of a possible car shortage or transportation difficulties. Shipments to tidewater passed the 2,000-car mark one day last week, but tonnage did not accumulate. While most of the arrivals were either on contract or on order there was sufficient free coal to meet all demands and to keep the market unsettled.

The boom that was expected after election is slow to materialize at Philadelphia. Mild weather continues to be



a deterrent, but buying by the railroads is improving. Regular commercial contracts also are productive of good business, for prices are better than for spot business. Spot prices hang at the same low level. Most mines are still on a 50 per cent basis, with plenty of them doing less work.

At Baltimore no life is shown in any branch of the steam or gas coal trade, but improvement is hoped for with the passing of election. The spurt of a few weeks ago was short lived and prices have gone back to the late summer level. The first week of November saw no export clearances of coal.

The Birmingham steam market is on the upgrade. The movement of spot coal is showing some increase week by week as additional business is taken on by the mines and contract customers are taking more liberal consignments. This is especially true of the railroads, which have increased their weekly quotas around 10 per cent over what they have been taking for weeks past. The seasonal demand from oil mills, compresses, gins and saw mills is providing an outlet for a good tonnage in the aggregate, and the hydro-electric companies are using a great deal of coal at their steam plants and will continue to do so until the drought is broken.

### Anthracite Demand Disappoints

Slow demand and lower prices for independent coals prevailed in the New York anthracite market during the last week, as weather conditions were not conducive to heavy coal burning. Movement, however, was heavy enough to prevent an accumulation of coal. Retailers have full bins of most sizes and add to their supplies only when assured of receiving a pro rata share of stove, which continues to lead the demand. Egg is giving the most trouble of the larger sizes. Chestnut moves fairly easily. The poorer grades of pea coal can hardly be moved even though quoted about 50c. less than the better coals. Demand for this size is extremely slow. Buckwheat No. 1 is the weakest of the steam coals; rice and barley are in better demand.

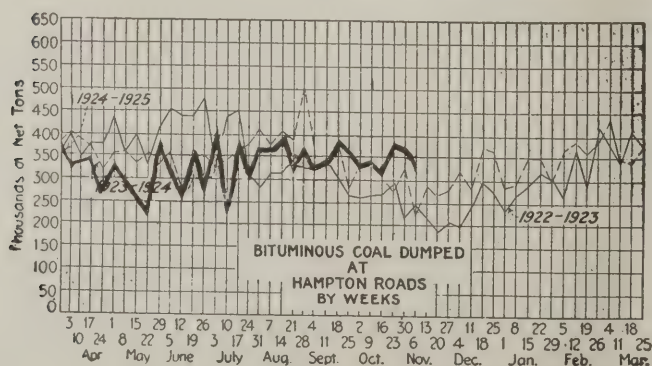
Because of the October shortage due to the flood, shippers have plenty of orders, but retail trade at Philadelphia is only moderate. The retail price situation is stronger since the independents have increased mines prices for November. The most wanted size among dealers continues to be stove, although more nut is being sold at retail. Steam coals are in better demand. Independents are moving nearly all of their production without price cuts.

Anthracite dealers at Baltimore have been looking askance at the growth of oil-burning equipment, due to the cost of domestic sizes of anthracite. The new equipment recently put on the market to consume buckwheat coal in the ordinary home is being watched with interest.

Trade has improved a little at Buffalo. There has been so much unseasonably warm weather that the consumer has had nothing to do but burn a little gas. All he wanted was stove and chestnut and of course if he was able to buy only furnace sizes he was distressed and refused to buy at all. The coke trade is still quiet.

### Car Loadings, Surpluses and Shortages

	Cars Loaded		Surplus Cars		Car Shortage	
	All Cars	Coal Cars	All Cars	Coal Cars		
Week ended Oct. 25, 1924.....	1,112,345	193,736				
Previous week.....	1,102,336	191,449				
Week ended Oct. 27, 1923.....	1,073,841	195,458				
Oct. 22, 1924.....	94,153	46,476				
Oct. 14, 1924.....	99,952	50,160				
Oct. 22, 1923.....	23,895	5,674			13,655	3,250





## Foreign Market And Export News

### Slight Upturn in British Coal Market; Output Above 5,000,000 Tons

Though the South Wales market is still in an unsatisfactory state, a gradual improvement is discernible. Interest has been revived in steam coals by the announcement that some important contracts for supplies over the next twelve months have been booked. Fewer price concessions are being made. Coal stocks are large, except the best smalls, which are scarce.

The Newcastle market is somewhat steadier though business is still very poor. Inquiry for current shipment has improved and some of the collieries are negotiating for November output. There are no contracts to report though two European gas works have taken 3,000 tons of gas coals for delivery next month.

Production by British collieries during the week ended Oct. 25, a cable to *Coal Age* states, was 5,061,000 tons, according to the official reports. This compares with 5,147,000 tons produced during the week ended Oct. 18.

#### French House Coals Active; Industrial Inquiry Dull

The general position of the French coal market is unchanged. Inquiry for industrial fuels is dull, but for house coals there is more activity, due to seasonal requirements. Stocks are not large and prices are firmly maintained.

The Nord and Pas-de-Calais are now trying to make up for the delays in shipments during September.

Imports of British coals, which fell off during the week ended Oct. 17 to 125,000 tons, increased the following week to 181,500 tons from South Wales alone. Prices are steadily falling at the shipping docks, and in spite of sterling being maintained at 86f. the margin between British and French prices (delivered) has lessened to the point of being rather dangerous in certain regions where British and French fuels enter into competition.

The shortage of rolling stock in France is less pronounced.

The M.I.C.U.M. ceased to function in the Rhenish-Westphalian Basin on Oct. 28. An organization to regulate the importation of German coals hereafter is under consideration. It probably will be controlled by the state and administered by representatives of French collieries, importers, merchants and leading consumers. At a recent meeting held at the Ministry of Public Works no agreement could be reached owing to divergence of views regarding the transport of coal by the Rhine.

During the first eighteen days of October, France and Luxemburg received 287,700 tons of coal; 213,700 tons of coke, and 21,600 tons of lignite briquets, a total of 522,600 tons. The daily average of 29,000 tons compares with 31,600 in September.

Between Oct. 23 and 29 the O.R.C.A. was supplied with 24,250 tons of coke through Ehrang and 31,215 tons through Aix-la-Chapelle, a total of 55,465 tons or scarcely 8,000 tons a day.

#### Hampton Roads Outlook Bright; Prices Hold Their Own

Business at Hampton Roads showed very little change, with prices holding their own and with prospects for better movement growing brighter. Coastwise business has been fair, bunkering good, and foreign shipments tend downward.

Prices reflect somewhat increased shipments to tidewater, and a number of inquiries from New England have had the effect of putting a more hopeful tone in the market. Domestic business is somewhat better in the retail trade, and optimism is the keynote of the situation.

Shippers have much faith in the effect of the presidential election on general coal movement, whether the effect is actual or imaginary.

#### U. S. Fuel Exports During September

	(In Gross Tons)	
	1923	1924
Anthracite.....	175,689	327,322
Bituminous.....	1,768,620	1,502,829
Exported to:		
France.....	36,990	27,067
Italy.....	37,135	33,590
Netherlands.....	29,655	
Other Europe.....	10,281	1,100
Canada.....	1,513,923	1,201,280
Panama.....		23,700
Mexico.....	4,876	5,803
British West Indies.....	4,103	20,184
Cuba.....	47,382	46,184
Other West Indies.....	17,833	17,011
Argentina.....	11,630	15,660
Brazil.....	38,106	77,282
Chile.....	848	781
Egypt.....		3,366
French Africa.....	6,384	7,606
Other countries.....	9,474	22,215
Coke.....	95,479	41,804

#### U. S. Fuel Imports During September

	(In Gross Tons)	
	1923	1924
Anthracite.....	8,695	7,777
Bituminous.....	50,321	22,782
From:		
Canada.....	46,729	14,492
Japan.....	90	7,540
Australia.....	3,500	750
Other countries.....	2	
Coke.....	1,374	3,511

#### Export Clearances, Week Ended Nov. 8, 1924

##### FROM HAMPTON ROADS

	Tons
For Brazil	
Braz. Str. Barbacena for Pernambuco.....	5,437
For Canada	
Fr. Str. Sierentz for Montreal.....	6,604
Br. Schr. Gerbevilles for Halifax.....	2,760
For Canal Zone	
Amer. Str. Ulysses for Cristobal.....	12,024
For West Indies	
Br. Str. Goathland for Puerto Plata.....	5,642

#### Hampton Roads Pier Situation

	N. & W. Piers, Lamberts Pt.: Oct. 30	Nov. 6
Cars on hand.....	947	1,215
Tons on hand.....	60,376	74,356
Tons dumped for week.....	123,808	96,083
Tonnage waiting.....	5,000	12,000
Virginian Piers, Sewalls Pt.:		
Cars on hand.....	1,434	1,731
Tons on hand.....	98,950	123,250
Tons dumped for week.....	98,183	108,842
Tonnage waiting.....	18,455	10,909
C. & O. Piers, Newport News:		
Cars on hand.....	1,734	1,950
Tons on hand.....	98,041	101,355
Tons dumped for week.....	102,847	87,540
Tonnage waiting.....	2,195	8,810

#### Pier and Bunker Prices, Gross Tons

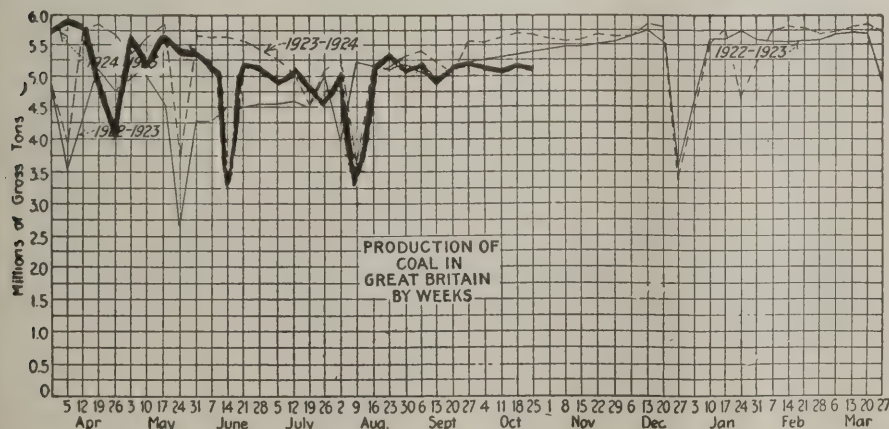
	PIERS	
	Nov. 1	Nov. 8†
Pool 9, New York...	\$4.75@ \$5.00	\$4.75@ \$5.00
Pool 10, New York...	4.65@ 4.80	4.65@ 4.80
Pool 11, New York...	4.40@ 4.55	4.40@ 4.55
Pool 9, Philadelphia...	4.90@ 5.25	4.90@ 5.25
Pool 10, Philadelphia...	4.45@ 4.70	4.45@ 4.70
Pool 11, Philadelphia...	4.30@ 4.50	4.30@ 4.50
Pool 1, Hamp. Roads	4.30	4.25
Pool 2, Hamp. Roads	4.15	4.15
Pools 5-6-7 Hamp. Rds.	4.00	4.00
	BUNKERS	
Pool 9, New York...	\$5.00@ \$5.25	\$5.00@ \$5.25
Pool 10, New York...	4.90@ 5.05	4.90@ 5.05
Pool 11, New York...	4.65@ 4.80	4.65@ 4.80
Pool 9, Philadelphia...	4.90@ 5.25	4.90@ 5.25
Pool 10, Philadelphia...	4.75@ 4.95	4.75@ 4.95
Pool 11, Philadelphia...	4.50@ 4.70	4.50@ 4.70
Pool 1, Hamp. Roads	4.40	4.35
Pool 2, Hamp. Roads	4.25	4.20
Pools 5-6-7 Hamp. Rds.	4.10	4.10

#### Current Quotations British Coal f.o.b. Port, Gross Tons

##### Quotations by Cable to *Coal Age*

	Nov. 1	Nov. 8†
Cardiff:		
Admiralty, large...	27s. @ 27s. 6d.	27s. @ 27s. 6d.
Steam smalls.....	16s.	16s.
Newcastle:		
Best steams.....	17s. 6d. @ 22s. 6d.	18s.
Best gas.....	20s. 6d.	21s. @ 21s. 6d.
Best bunkers.....	18s. 6d. @ 19s.	17s. 6d. @ 18s. 6d.

† Advances over previous week shown in heavy type, declines in *italics*.







## News Items From Field and Trade



### ALABAMA

Final details of the Sloss Sheffield Steel & Iron Co., Alabama Co. merger are being worked out in New York by officials of the two corporations and the agreement probably will be made effective Nov. 15.

Fire, said to have originated in the offices of the Piedmont Coal Co., at Dora, Walker County, Nov. 5, spread to adjoining buildings and caused damage estimated at \$40,000. Shortage of water necessitated the dynamiting of a building to stop the progress of the flames.

W. L. Smith and associates, operating the Raccoon Coal Co., at Altoona, in Etowah county, are now producing coal from their No. 4 mine at the rate of 150 tons per day, with the expectation of increasing the output to 500 tons per day soon.

A \$6,000,000 merger was effected Nov. 1 with the completion of negotiations by the Alabama Byproducts Corporation, controlled by Morris W. Bush and Horace Hammond, for the acquisition of the Pratt Consolidated Coal Co. and its subsidiary, the Globe Coal Co., of Birmingham, owned by George B. McCormack and Erskine Ramsay. The consolidated company will control 110,000 acres of land in Jefferson County with more than twenty mines having an annual output of 2,500,000 tons of coal. The Pratt Consolidated company had been on the market for some years, Messrs. McCormack and Ramsay having offered it to the Tennessee Coal, Iron & R.R. Co. and having on several occasions been in negotiation with the Walter Moore interests.

Fire of unknown origin starting in the commissary building of the American Fuel Co., Beltona camp, on the morning of Nov. 2, destroyed the building and contents and also supply houses, office and garages located nearby, entailing a loss estimated at \$50,000. Beltona is located in the northern section of Jefferson County. Employees of the company were unable to make any headway in fighting the flames on account of the scarcity of water due to the long drought. It is stated that construction of new buildings to replace the burned structures will begin at once.

### ILLINOIS

The mine at Niantic, which has been closed since last April, is now hoisting coal regularly. Sixty men are employed, which number will be increased soon to 100. The coal is trucked to Decatur, ten miles east, where it will compete with the Decatur mined coal.

The Franklin County Coal Co. has made extensive improvements at its mine at Sandoval and expects to have it in operation soon.

The Wolf strip mine, near Belleville, just off the Freeburg-New Athens road is now in operation. A switch has been laid to the mine from the Illinois Central at Lementon.

A. A. Bryden, formerly Southwestern Sales Manager of the Southern Gem Coal Corp., at St. Louis, is appointed Southwestern Sales Agent for the Saline County Coal Co. of Chicago. He has offices in the Wainwright Bldg., in St. Louis.

George Adams, of Matherville, has been named manager of the Rex mine, near Warner. Mr. Adams takes the place of Thomas Mills of Rock Island, who was accidentally killed at the mine recently.

An investigation of the fire which destroyed the uncompleted shaft and works of the Devalley Coal Co., on the Urbana road six miles west of Danville, disclosed the fact that the fire not only was incendiary but that the bottom works were dynamited before the fire started.

The Lovington Coal Co. mine near Lovington, which was reopened by local capital late in September after having been shut down all summer, is closed again for lack of business.

A claim of \$200,000 against the defunct Southern Gem Coal Corporation has been allowed the Willis Coal & Mining Co., of St. Louis, Mo., by Judge English in the federal court of East St. Louis. Also the court permitted the Willis company to cancel a lease and take back full control of two mines in Perry County which the Southern Gem had never operated to any extent and which are now flooded.

James Steel has resigned as superintendent of the St. Paul Coal Co.'s mine at Ladd, and has removed to northern Wisconsin to reside. He has had charge of mines in the Ladd and Cherry regions for a number of years.

### INDIANA

Three men were killed early this month in an explosion in the Blackhawk mine of the Miami Coal Co. twelve miles east of Terre Haute. The three were substitute shot firers on their first trip down, replacing men who had been injured in a blast in the mine only a few days previous. A windy shot is

thought to have caused the latest explosion.

New developments in the Sullivan County coal field are expected by a merger recently consummated. W. H. Leland, of Chicago, until recently, president of the W. H. Leland Coal Co., with mines in Kentucky, Indiana and Illinois, has joined forces with the J. Wooley Coal Co., one of the oldest individual companies in Indiana and a pioneer company in the Sullivan County fields. The company intends developing holdings in Sullivan County. A diamond drill is on the Wooley property testing underground conditions in that vicinity. J. D. McInnes, who for thirteen years has been with the Wooley company, has been retained as superintendent.

### KENTUCKY

At Madisonville, the property of the Pontiac Coal Co. was sold at public auction on Nov. 4 to the Pontiac Coal Mining Co., for \$19,320. The property was sold to satisfy company creditors.

The Black Joe Coal Co., at Butterfly, Perry County, in the Hazard field, owned by the J. B. Stores Co., interests, Cincinnati, has been sold by the receivers to W. E. Davis, of the Midland Mining Co., at a reported price of \$26,000.

Recently the Franklin Circuit Court, at Frankfort, held a 1 per cent oil production tax unconstitutional. The case is pending in the Appellate Court, and a number of suits for recovery of taxes paid also are pending in state courts. Every Legislature in years has had a coal tax bill before it, but none has ever passed such a tax bill.

L. F. Brashears, of Hazard, was the highest bidder on the plant of the Harveyton Coal Co., at Harveyton, one of the properties of the J. B. Stores in the First Creek field, which went into hands of receivers about a year ago due to unsatisfactory business conditions. Mr. Brashears' bid was \$43,000. It includes the lease, mines, machinery, property and the commissary of the J. B. Stores. The mines have been operated by the receivers, J. B. Rickey and others, since last winter.

The Kentucky Washed Coal Co., at Nonell, which was out of the game for some months as a result of a landslide which wrecked its fine washer and tipple, is now producing heavily, its strip production on Oct. 29 totaling 31 cars of coal. A new washing plant, equipped with drying and dewatering systems,



is being installed by Krehbiel & Co., engineers, of Chicago, and will be in operation in December, replacing a temporary washer which has been in use since the plant resumed a few weeks ago.

### MINNESOTA

An interesting talk on coal conditions in the Northwest was broadcast over the Twin City radio central, WCCO, last week by F. O. Brandt, of the Northern Coal & Dock Co., St. Paul. He touched upon the tendency to hold back in buying and the result of piling up orders when the rush comes, along with a possible turn of cold weather.

There has been a final attempt to meet the low prices on coal from western Kentucky over the L. & N. and the M. & St. L. to the twin cities district. Other roads evidently became tired of having an adverse competitive rate and started tariff rates to meet them for the entire Northwest. This started opposition from the coal trade, which did not want to have the rate fabric upset completely. The dock association and the Franklin County operators were agreed in opposition to this step and have initiated efforts to have the matter adjusted without a complete overturning of present rates.

### NEW YORK

The Bethlehem Steel Co. has completed a new battery of 57 coke ovens at its Buffalo plant and will put in a second unit of the same size at once, replacing the old and somewhat out-of-date equipment formerly used. The company has its own mines and will use 1,000 tons of coal a day for coke making. The old process of 18 to 20 days now gives way to one that requires only 12 hours.

### NORTH DAKOTA

The fire which has been burning for more than a year in the lignite mine of the Haynes Coal Co. has assumed serious proportions again. It was once thought to be in control but a breakdown of pumps permitted its further spread. There is some danger of the

fire getting across the state line—or under it—and into the coal seams of South Dakota.

### OHIO

A small mine of the Dean Coal & Coke Co., located at Moxahala, was sold at receivers sale Nov. 3 to Charles A. Bruner, of Columbus, at his bid of \$4,100. The property had been appraised at \$20,516.60. The new owner will operate the property to supply his retail business in Columbus.

Several coal mines in the Bailey Run field which has been almost completely idle for months, started recently, operators announce. More than 300 men were given employment.

Eight members of the mining division will meet during the week of Nov. 17 at Pomeroy to obtain specific instructions for the most extensive first-aid and mine rescue campaign thus far conducted in the state, Chief Watson announced. The following week the remaining nine members of the division will meet at Cambridge to learn of such plans for their respective districts.

Fire, said to have been of incendiary origin, on Nov. 1 completely destroyed the tippie, power plant and other surface buildings at the Middle States Coal Co.'s Mine No. 24, near Jacksonville. A presumed attempt also was made at the same time to destroy the tippie of the company's Mine No. 68, about a half-mile south of No. 24, by use of explosives. Little damage was done at Mine No. 68, but the loss at Mine No. 24 is estimated at \$60,000, the tippie having been old but in good repair. Trouble is said to have arisen over the use of mechanical loaders and the operation of the mines on a co-operative basis, with the result that about one hundred men formerly employed at the mines were thrown out of employment. The leasors of the mines assert that the union scale was being paid for all hired day men.

Jerome Watson, Chief Deputy of the Ohio Department of Mining, has discovered that fire is still burning in the Doanville Mine which started Dec. 19, 1920. The openings were sealed up at that time and it was believed that the

fire had been extinguished but upon opening it recently it was still smouldering. Efforts will be made to fight the fire in order to get the mine in condition for operation.

### PENNSYLVANIA

Failure of the Legislature to make a specific appropriation for conducting examinations for the office of state mine inspector has placed Joseph J. Walsh, head of the Bureau of Mines, and his department in a rather embarrassing situation. It is understood that the state Department of Mines and Mining is without sufficient funds with which to conduct the examinations, defray the expenses of a hall, etc. As a result, Chief Walsh has had to turn to the state Department of Education for aid.

Dr. W. S. Blaisdell, a well-known coal operator of central Pennsylvania, was elected to the state Senate from the Indiana-Jefferson County district in the Republican landslide last week. The term is four years, during which there are two sessions of the Legislature.

Erection of a breaker has been started near Shamokin by Madiera, Hill & Co., owners of collieries at Natalie and Greenough. The new breaker, which is to be of steel construction and equipped with the most modern machinery, is intended to prepare the product of both the Natalie and Greenough mines, taking the place of the antiquated breakers now in operation at these collieries. These will be destroyed as soon as the new breaker starts in operation. The company has already erected an office building and a mule barn near the site of the new breaker.

The Susquehanna Collieries Co., has begun an improvement campaign in the collieries in the Mount Carmel section. The Richards Shaft, which is particularly gaseous, has a new fan with a capacity of 150,000 cu.ft. per minute. It is run by electricity furnished by the mammoth power house of the company. An even larger fan will soon begin its work of clearing the mines of gas and circulating air through the workings at the Scott colliery and the Pennsylvania colliery also will be equipped with a similar fan.

The Warner Youghiogeny Coal Co. of Pittsburgh, has contracted with the Roberts & Schaefer Co. for the installation of Marcus screens and R. & S. loading booms in its tippie at Charleroi.

Four men were seriously burned in an explosion Nov. 5 in the mine of the Hustead-Seamons Coal Co., at East Millsboro, 1½ miles from Brownsville. The men were drilling with an electric drill, it is believed, when a spark from the machine ignited a gas pocket. A sheet of flame enveloped the room. The miners were hurled to the floor of the coal seam, their clothing on fire. The explosion did not extend beyond the one room, and did not damage the workings.

The old Neilson mine in the western portion of Shamokin, which was aban-



Portion of Louise Town Site

Courtesy of Bertha-Consumers Co.

This modern mining camp is at the Louise operation of the Bertha-Consumers Co., located at Louise, Brooke County, W. Va. The mine has a daily capacity of 1,500 tons.



done in 1902 during the miners' strike, has been taken over by a group of outside capitalists and operations will be resumed in the near future. New rock slopes are planned and modern hoisting machinery also will be installed. The company which has taken over the mine also has obtained valuable concessions from the Susquehanna Collieries Co. and the Lehigh Valley Coal Co. It is expected the new working will give employment to between 1,000 and 1,200 men and boys.

A tribute to the popularity of W. J. Richards, president of the Philadelphia & Reading Coal & Iron Corporation was paid in the Pottsville field on election day. Mr. Richards was one of the Republican electors in Pennsylvania and he received hundreds of votes above the totals cast for the 37 others on the ticket. In Fost township, Schuylkill County, more than 100 Democrats, all coal miners, split their tickets so that they could vote for the coal operator.

Announcement has been made by the Philadelphia Coal & Iron Co. of the promotion of Richard F. May, assistant to the division engineer in the Shamokin district to the post of division engineer in the Mt. Carmel field. Mr. May succeeds Albert R. Harris, who has been advanced to the position of general superintendent of the Locust Gap colliery.

## UTAH

J. A. Stallings, sales manager of the Spring Canyon Coal Co., Salt Lake City, is described as a "very sick man." Mr. Stallings has been ill for some months, but recently returned to his desk for a short time in an unsuccessful effort to attend to his duties. He is now in the hospital.

Approximately 160 acres of coal land in Grand County is to be offered for lease by the register of the Salt Lake Land Office, Nov. 17. The lease is made on application of John G. Adams. The terms are a royalty of 10c. per ton of coal mined, for production in the fourth year after the lease of 1,600 tons and for expenditure of not less than \$3,000. The lease will be awarded the person or persons bidding the highest premium above these terms.

## WASHINGTON

Enrollment is fairly heavy in the night schools conducted by the Pacific Coast Coal Co. for its employees in the mining towns of Carbonado, Black Diamond, Burnett, Newcastle and Issaquah. These classes, open to any employee, have been running for two years, offering grade school work and especial aid for foreigners who wish to become American citizens. This work is directly in charge of H. J. Hoff, a graduate of Bethany College, Lindsborg, Kan., who has studied in Germany, Russia, Italy and France and who received the degree of doctor of philosophy at the University of Illinois in 1908. He is assisted by R. R. Sterling, a graduate mining engineer, and by Mrs. C. C. Christenson, a graduate of Oberlin College.

## WEST VIRGINIA

All records for the shipment of coal from Norfolk & Western Ry. territory during the last two years were broken in October, it has been announced by the company. The company handled 62,731 cars, or more than 3,000,000 tons of coal, between Oct. 1 and 28.

W. A. Phillips, president of the Pemberton Coal & Coke Co., in the Winding Gulf District; of the Ashland Coal & Coke Co., in the Pocahontas district, and Majestic Colliery Co., located in the Williamson field, is still a patient at the Lankenau Hospital, in Philadelphia. The home of Mr. Phillips is at Mt. Carmel, Pa.

The following changes have been made in the operating organization of the Elkhorn Piney Coal Mining Co.: Lew Roach, formerly general superintendent of the Powellton (W. Va.) division, has been promoted to general manager of all mines, vice D. R. Phillips, resigned. Mr. Roach will continue his office at Powellton. J. W. Ailstock, formerly mine superintendent at the Weeksbury (Ky.) division, has been promoted to general superintendent of the operation of Stanaford, W. Va., vice F. M. Addis, resigned.

## WISCONSIN

The C. Reiss Coal Co. docks and two ore docks belonging to the Chicago Northwestern R.R. at Escanaba were damaged by fire Oct. 31. A fireman lost his life and property estimated to be worth \$2,000,000 was wiped out. A huge stock of anthracite on the Reiss dock was partly reduced by the flames. Several days' work was necessary to save the unburned part of the stock.

## WYOMING

The Union Pacific Coal Co. is co-operating with the city of Rock Springs in preparing plans for a city sewerage system and in the diversion of Bitter Creek from the center of the city to the northern and eastern side of Rock Springs. The project will cost several hundred thousand dollars.

The Lion Coal Co., operating at Lionkol, in the Rock Springs district, on Oct. 31, closed its properties at that place for an indefinite period, giving no reason for the shutdown. The properties have a production of from 1,200 to 1,400 tons daily, employing 155 men. The Union Pacific Coal Co. properties also were working slack the latter part of October, light freight shipments lessening the demand for their output.

The Union Pacific has discontinued fuse shotfiring in the Rock Springs district and has returned to electrical firing by a shotfirer after the day shift goes off.

## CANADA

Howard Stutchbury, coal commissioner for Alberta, in reply to an inquiry from the Federal Coal Committee at Ottawa as to whether the Alberta mines could supply coal to central Canada this winter, stated that al-

though production would be much below normal there is no reason why a considerable tonnage should not be available for Ontario provided freight rates are adjusted, the present rate of \$12.70 per ton being prohibitive. Production in Alberta will be speeded up if due notice of Ontario requirements is received.

The total output of the Dominion Coal Co. for September was 273,374 tons an increase of about 40,000 tons over the August output but less than the production of September, 1923. The success of the longwall system of mining at Sydney Mines has encouraged the management to put it into operation in other collieries.

The operators of all the mines in the Edmonton coal field, with the exception of the Penn mine, have expressed their intention of signing a contract with the miners on the terms of the award of the conciliation board. There will, therefore, be no walk-out, not even at the Penn mine, according to officials of the Edmonton District Federation of Miners.

Premier Greenfield, of Alberta, has announced that the following will compose the commission to investigate the coal-mining industry of the province, in accordance with a resolution passed at the last session of the Provincial Legislature; S. M. Evans, of Edmonton, chairman; R. G. Drinnan, director of the Mountain Park Collieries and of the Luscar Collieries, and Frank Wheatley, president of the Alberta Federation of Labor. The commission will start work at once and will thoroughly probe all phases of the coal-mining industry in Alberta.

## New Companies

The Richard Coal Co. has been organized at Huntington, W. Va., with a capital stock of \$100,000. Chiefly interested in the new company are, R. H. Williams, T. J. Fisher, J. F. Eaton, J. W. Fitchett and M. L. Burnett, all of Huntington.

The Gould Road Coal Co., 102 N. 3rd St., Steubenville, Ohio, has been chartered with a capital of \$30,000 to mine and deal in coal at wholesale and retail. Incorporators are: Andrew Pipo, Harley S. Thompson, Clyde Robeson, William Jacobs, John Hostovitch and Marshall N. Duval.

The Harmon-Burton Coal Co., Zanesville, Ohio, has been incorporated with a capital of 1,000 shares, no par value designated, to mine and deal in coal and coke. Incorporators are: William S. Harmon, H. P. Dean, Robert E. Marshall and Emmet R. Curtin, Jr.

The Lyell Coal Co., of Huntington, has obtained a charter providing for the issuance of 400 shares of stock of no par value. The incorporators are connected with the W. E. Deegans coal and mining interests of Huntington, where the new company will have offices in the Deegans Building. The company will operate mines on Keeney's Creek. Incorporators are: J. F. Grimet, I. F. Vass, A. W. Fitzwater, H. N. Priddy and F. H. Hall.

The Lincoln Coal Co., Covington, Ky., capital \$250,000, has been chartered by Irvin Davis, August Helm and H. H. McLean.

The Black Diamond Coal Co. of Gravity, Iowa, has been incorporated with a capital of \$50,000, to mine and sell coal. The company has the following officers: E. D. Morris, president; George W. Evans, vice-president, and H. E. Davidson, secretary-treasurer. The company has sunk a mine, finding a 26- to 28-in. vein of coal at a depth of 200 ft.



## Traffic

### New Coal Rates Approved by New York Commission

The New York State Public Service Commission has approved the new tariff schedule of the Buffalo, Rochester & Pittsburgh R.R. on coal (anthracite, pea and smaller sizes), carloads minimum weight marked capacity of car, except that when car is loaded to full visible capacity actual weight will apply, from Le Roy to Buffalo, \$1.76 per ton. The new rate became effective Nov. 1, 1924, P. S. C. No. 2022.

The commission also has approved the tariff of the New York Central R.R. (East) on coke, coke breeze and coke dust, carloads minimum weight in open cars 50,000 lb. (except that when car is loaded to cubical or visible capacity actual weight will apply, but not less than 35,000 lb.) and in box or stock cars 40,000 lb., from Buffalo, East Buffalo and Harriet to Green Island and Troy \$2.90, a reduction of 50c. per net ton. The rate becomes effective Nov. 28, 1924. Sup. No. 1 to P. S. C. N. Y. C. No. C-148.

### Indiana Rate Order Modified

Modification of the order in the matter of Indiana rates, so as to except from its provisions certain intrastate rates applicable between points in Indiana, has been ordered, upon rehearing, by the Interstate Commerce Commission. The modification is as follows:

"We are of the opinion and find that the rates and charges for the transportation of coal from mines in the Linton, Brazil and Princeton districts in Indiana to Irvington, Ind., and from the Linton district to Putnamville, Ind.; for the transportation of coke from Indianapolis, Ind., to Irvington; and for the transportation of straw, in carloads, from Veedersburg, Hillsboro and Layton, Ind., to Marion, Ind., in effect on Jan. 28, 1921, did not cause any undue or unreasonable advantage, preference, or prejudice as between persons or localities in intrastate commerce, on the one hand, and intrastate or foreign commerce on the other, or any undue, unreasonable, or unjust discrimination against interstate or foreign commerce. Our order will be modified accordingly."

### C. & O. Lowers Through Rates To Northwest

New and lower rates to approximately 2,100 points of destination in the states of Iowa, Kansas, Minnesota, Missouri, Nebraska, North and South Dakota are to go into effect on Dec. 5 on the Chesapeake & Ohio Ry., according to an announcement just made by A. M. Dudley, general coal freight agent of that road. The changes were made to meet those now in effect from points on the Louisville & Nashville R.R. Among some of the rates to representative points from mines in the New River field are the following: Cedar Rapids, Iowa City, Marshalltown, Ames, Des Moines, Waterloo, Iowa,

\$4.68; Clinton, Iowa, \$4.32; Council Bluffs, Iowa, \$5.53; Omaha, Neb., \$5.53; Mason City, Iowa Falls, Iowa, \$5; Sioux City, \$5.97; Winona and Rochester, Minn., \$5.09; Mankato, Minn., \$5.15; Springfield and Minneapolis, Minn., \$5.55; Marshall, Minn., \$5.62; Ghent, Minn., \$5.87; Porter, Minn., \$6.08; Watertown, S. D., \$6.14; Pierre, S. D., \$7.23; Aberdeen, S. D., \$6.56; Houston, S. D., \$6.73; Oakes, N. D., \$6.93; Kansas City, St. Joseph and Dearborn, Mo., \$5.53; Bettendorf, Muscatine and Davenport, Iowa, \$4.20; Ottumwa, Iowa, \$4.56; Leavenworth, Kan., \$5.53; Waterloo, Iowa, \$4.68. Rates from the Kanawha district to the points mentioned are 15c. a ton less.

## Obituary

**J. F. Healy**, chief engineer of the Hutchinson-Island Creek Coal Corporation, of Omar, W. Va., died suddenly Nov. 1 at Omar. He was born in Blossburg, Pa., sixty-four years ago and was a graduate of Pennsylvania State College. For many years Mr. Healy was connected with the Davis Coal & Coke Co. and for a time was general manager of the Davis Colliery Co. For a time he was allotment commissioner of the Chesapeake & Ohio, afterward becoming connected with the Main Island Creek Coal Co.

**Charles D. Junkins**, secretary of the Monongahela Coal Association and long identified with the business life of Morgantown, W. Va., died at the county hospital at Morgantown within 24 hours after suffering a cerebral hemorrhage at his office. Mr. Junkins, who was 60 years of age, was a native of Randolph County but had been connected with various enterprises in Morgantown for a period of more than 20 years. He also was manager of the Morgantown Brick Co., and secretary of the Morgantown Country Club. At one time Mr. Junkins was associated with the late John A. Clark of Fairmont in the coal business. A few years ago he was identified with the North American Coal Co., continuing with that concern until it was absorbed by B. M. Chaplin and associates.

An unusual career was brought to a close with the passing of **Dr. Bruno V. Nordberg**, founder of the Nordberg Manufacturing Co., Milwaukee, Wis., whose death occurred Oct. 30, at the age of 67. For more than forty years he was closely associated with engineering progress in the power and mining machinery fields. He was born in Finland in 1857, was graduated from the University of Helsingfors in 1878 and came to this country in 1880.

Death recently claimed **W. G. Robertson** of Scranton, Pa., who was prominent in coal mining circles here for almost 50 years. In that time he served as a mine foreman, engineer, coal operator, etc. For a time he also was Director of Public Works in the city of Scranton. He was buried at Dunmore, Pa.

## Coming Meetings

**Illinois Mining Institute**. Annual meeting, Nov. 22, Elks Building, Springfield, Ill. Secretary, Martin Bolt, Springfield, Ill.

**American Society of Mechanical Engineers**. Annual meeting, Dec. 1-4, Engineering Societies Building, 29 West 39th St., New York City. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

**West Virginia Coal Mining Institute**. Annual meeting, Dec. 2-3, Welch, W. Va. Secretary, R. E. Sherwood, Charleston, W. Va.

**Coal Mining Institute of America**. Annual meeting, Dec. 3-5, Chamber of Commerce Bldg., Pittsburgh, Pa. Secretary, H. D. Mason, Jr., Box 604, Ebensburg, Pa.

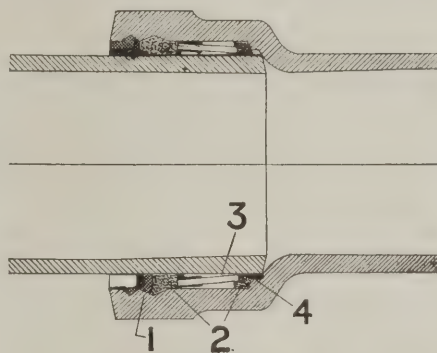
**West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers**. Fourth annual convention, Dec. 12 and 13, Huntington, W. Va. Secretary-Treasurer, Herbert Smith, Huntington, W. Va.

## New Equipment

### Precalced Cast-Iron Pipe

Two features differentiate the cast-iron pipe manufactured by the McWane Cast Iron Pipe Co., of Birmingham, Ala., from the standard product. The first is the fact that small sizes—1½-, 2- and 3-in. pipe are made; second that all pipe has precalced joints.

The precalced joints greatly increase the ease and speed with which the pipe is connected, and eliminate the need for tediously pouring lead joints in the field, a job of no small dimension where the pipes are small and their lengths short. It is stated that this combination of bell-and-spigot joint, factory-



Can Install This Cast-Iron Pipe with Little Labor

By having most of the joint formed at the factory this cast-iron pipe may be easily put in position on the job. This is an important detail when rapid progress must be made, especially in cold weather.

made, with short lengths of pipe cast by the McWane green-sand process, overcomes the difficulty occasioned by the brittleness and lack of flexibility of small cast-iron pipe lines.

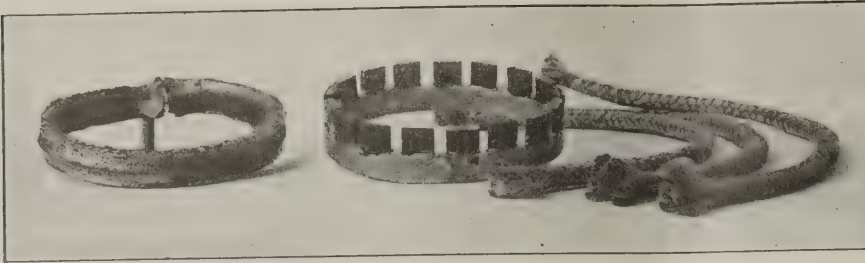
This small pipe, offering the high resistance of cast iron to the corrosive action of soil, water, and acids already has been used extensively by many mines and industrial establishments in place of wrought-steel or iron pipe.

In the 4- and 6-in. sizes the pipe is made in standard 12-ft. lengths. These sizes, too, are equipped with the precalced joint which is made about a mandrel while the pipe is in a vertical position. The mandrel, being slightly larger than the spigot end of the pipe it represents, provides ample clearance for entry of the latter. In the order named, braided jute, a specially-prepared ring of iron wedges embedded in lead, two more braids of jute, and a final filling of molten lead, are placed in the pipe bells around this mandrel. What will be the lower half of the joint circumference is then precalced.

Fig. 1 shows the precalced side downward. Driving the lead in at the top forces the pipe down to a firm seat at the bottom, and a positive joint results.

It will be observed that this is not





#### Materials Used When Making the Precalked Pipe Joint

For gas joints an extra lead ring is supplied. It can be slipped over the spigot end of the pipe and forgotten until the joint is completed in the regular way.

simply a lead joint, but a combination lead-and-jute joint. The quantity of lead is gaged so that the force of the blows in calking extends through the lead to the top jute and thence through the wedges to the bottom jute, the latter being forced by the wedges into the groove shown at the base of the bell. This gives three points at which the water or gas is held, the bottom jute, the top jute and the lead.

The function of the wedges is not only to carry the force of the blow from the top to the bottom of the joint, thus insuring tightness and rigidity, but also tighten automatically the joint materials in case of external stresses that might tend to deflect the line. When such stresses occur the end of the pipe 4 at the joint subjected to strain tends to go down and the point at 1 tends to come up. The compressed jute at the bottom of the bell resists this tendency, but if the strain should be such as to deflect the joint slightly the bottom jute will be further compressed and will force back the wedges at the bottom of the joint, 3, thus compressing both layers of jute at 2.

Laying precalked joint pipe is therefore a process of finishing, rather than making, the joints. The calker is the first and only man needed after the spigot end is slipped into the pipe bell. The lead-pourer, yarker and bell-hole digger are not needed, all their work previously having been done by the manufacturer, and the joints delivered ready to calk. It is estimated that the labor of two men is saved in the average pipe-laying job.

#### Put the Little Hoist Where Headroom Is Low

The Lo-Hed mono-rail electric hoist, designed and built by American Engineering Co., of Philadelphia, is a general purpose hoist with a number of important and exclusive features.

It differs radically in design from other electric hoists. An outstanding feature is that it is claimed it operates under low head room. The motor and drum are arranged on opposite sides of, and parallel to, the I-beam rail and the load block can be drawn up between them, into the body of the hoist until it practically touches the bottom of the rail.

The space taken by the 1-ton plain trolley hoist under the beam is only 10 in. while the 3-ton plain trolley requires only 14 in. As a result the hoist can be used in many places where other units could not meet the head room conditions, especially where ceilings are low, bulky loads are handled,

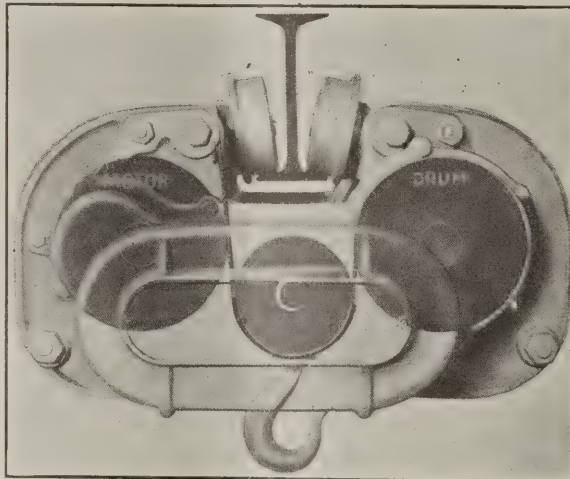
obstructions must be cleared, or where large size pieces must be placed on machines and trucks.

Another important feature is the complete and easy accessibility of all working parts. By simply removing the outer covers, which can be done in a few minutes, all parts of the hoist can be inspected, and, if necessary, any part can easily be removed. The motor, for example, can be taken out in a few minutes without disassembling

of standing up under the severest conditions to which a hoist can be subjected. Only the best materials and workmanship are used. All gears are of drop forged steel. Positive automatic lubrication is provided. Hyatt High-Duty bearings are used on all gear shafts and the trolley wheels, thus reducing friction to a negligible quantity. Automatic lowering brake, of drop forged steel, holding brake and upper limit switch combine to assure safe operation at all times. Brakes take effect instantly, stopping the load without drift and affording unusually sensitive control.

The complete unit has a mechanical efficiency of over 80 per cent and a factor of safety of at least five at full load.

It is built in sizes of 1,000 to 12,000 lb. capacity. There are five types for either a.c. or d.c. The first four types are arranged for operation from the ground. The various types are as follows: (1) Bolt suspended, (2) plain trolley, (3) hand-geared trolley, (4)



#### Phantom View

Because the hook of this hoist can be nearly bumped against the I-beam it can be used in places having low head room.

the main frame or body of the machine, and either with or without a load on the hook.

In addition to these features the hoist is built with the idea of making it a quality piece throughout, capable

motor-driven trolley, (5) cab controlled, motor-driven trolley, with either open or inclosed cab.

Two or more hoists can be hooked up in tandem and the capacity increased accordingly.

#### Motor-Driven Trolley Type

Maximum service and utility of space is obtainable with a hoist which can lift and carry material close to the roof. Cabs for both indoor and outdoor service keep the operator out of rain and cold.





# COAL AGE

McGraw-Hill Company, Inc.  
James H. McGraw, *President*  
E. J. Mehren, *Vice-President*

Devoted to the Operating, Technical and Business  
Problems of the Coal-Mining Industry

R. Dawson Hall  
*Engineering Editor*

Volume 26

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Number 21

## Our Wasteful Railroads

**F**EW consumers of coal are more wasteful than the railroads. It would be difficult to make a coal operator wax eloquent on this defect. He is apt to regard this trait as a virtue and to keep silence lest the railroads should be spurred to action or their inveterate enemies should force them to it.

But perhaps the operators would feel more disposed to advocate a measure of economy if they believed it would help rather than injure the coal industry. The railroads, if they introduced stokers, or pulverized-coal furnaces, could be converted into users of fine coal. In doing this they would aid the coal companies by increasing the market for screenings.

Here lies one of the largest outlets for fine coal—an outlet that so far has never been developed. The change would be so beneficial to the railroads and so much less revolutionary, expensive and questionable than electrification that it would seem they should easily be induced to consider it. We commend this matter to the consideration of the Research Committee of the National Coal Association, which, we believe, is looking for opportunities for the marketing of screenings and to the anthracite companies which find the disposal of fine coal a difficult problem. What a blessing it would be to the latter if the railroads that have ceased to burn anthracite or are now using an excessive quantity of soft coal would return to the fuel they once burned, consuming however, the finer sizes that are now a drug on the market. The public utilities have blazed the trail that leads to the use of fine coal. Let the railroads follow it.

## Briquetting Incombustible

**M**UCH wonder has been expressed that briquetting as a process has been so slow to justify itself. The exact reasons are not quite clear, but there are many that might be advanced. Some of the briquets are not durable. They are not waterproof and they soon fall apart. Most of them are made from fine coal which usually contains a large percentage of incombustible material. Washing of this coal when the attempt is made in a crude way is extremely wasteful, and there is a big waste of good binding material in briquetting so much rubbish with the pure coal. Moreover, the public when it gets the briquet not only has a fuel with a low heat content but finds that it has an unusual ash nuisance with which to contend.

Today, we record a commendable effort to present the public with an unusually pure briquet having a binder of real fuel value, and it will be seen whether it makes the headway on the market that its sponsors have reason to anticipate. If it does it will either sweep the field or induce briquetters to pay more atten-

tion to the importance of washing coal before briquetting it.

The domestic consumer may have an extremely hazy notion as to effect of the freight paid on incombustible on the cost of running a furnace. He may not realize just how much he is hampered by the presence of ash. He may not sense its effect in causing a loss through unburned coal. But he has a keen perception of what is the aggregate cost of maintaining his fire, and he is actuated by that perception, with the result that he will ultimately turn where the best results are obtainable.

The selling of coal, briquets and oil is subject to modes like the fashions, but in the end, after many jumps in the dark, the consumer will alight and will stay where he is convinced that his interests are best served, no matter how persuasive may be the salesman who for a brief while reaches his ear and obtains his nimble dollars.

## The Unsafety of Safety Lamps

**D**AN HARRINGTON'S article on the safety lamp and its dangers, contained in our issue of Oct. 30, must have raised in many minds a question as to the inherent safety of such lamps. It is interesting to note, however, that all so-called failures of safety lamps in this country have been shown to be due to their being in what the U. S. Bureau of Mines would term unpermissible condition. They were key-locked lamps which the mine examiners or others had taken apart in the mine to relight or else they were improperly assembled and would not have passed any of the simple examination tests of a well-instructed lamphouse tender.

This much, however, is certain: The lamps were the cause of the disasters enumerated, and Dan Harrington is justified in regarding that form of equipment as unsafe if in its use disasters frequently occur. Why they occur is only a matter of importance if we, knowing how they happen, can prevent their recurrence. The ugly feature is that we have known how to forestall them for so many years and still the accidents happen. We want a device that does not contain this menace, if we can get it.

The electric lamp is safer than the closed flame lamp, but it does not show the presence of gas. Consequently with it men will continue to work in a dangerous atmosphere. Their work would be quite safe so far as the electric lamp is concerned, but as there are many ways in which gas can be exploded it is necessary that the workmen should be warned, and speaking broadly: How shall one operate a gaseous mine without a flame safety lamp? There are ways of testing gas, more accurate and certain than the lamp affords, but they are slow and not as simple. We may, however, have to adopt them.



## Alternating-Current Locomotive Haulage in Mines Must Wait

**S**IGNIFICANT to the future of electric traction in the mining industry are the locomotives for which the New York, New Haven & Hartford R.R. Co. has recently placed its contract. Though they receive alternating current from the transmission lines they are actually driven like their predecessors by direct-current motors. These railway locomotives contain their own voltage-reducing and power-converting substations.

They are equipped with a transformer for lowering the 11,000-volt, 25-cycle, single-phase current to 2,300 volts and with a synchronous motor-generator set to convert that current from alternating to direct. The traction motors are of the direct-current railway type as are those at the coal mines. The direct-current generator which delivers current to the traction motors is designed with a variable field, and the speed of the locomotive is regulated by the field control of the generator.

So despite all the advance in electrical matters the traction motors are still of the standard series direct-current type similar to those used in coal mines. It appears, therefore, that the coal operator has the equipment that is best suited to his needs and indeed that which fits best all traction equipment.

Evidently though the electric haulage of the far-off future may be by self-contained storage-battery locomotives, those which are operated from power lines will probably continue to use direct current.

## Why All This Ado?

**A**LBERTA and British Columbia have a wealth of coal—good coal—and Canada in all its central provinces has none. It is pathetic to notice what a complex this has created. In the United States it would be said: "It's magnificent coal but what use is it? Leave it where it is. In twenty or thirty years it will be valuable perhaps. Meanwhile we will mine it for local use. It is not wealth at present but it will be in time." The U. S. Geological Survey would calculate its extent and its thickness, put a price of \$60 to \$600 an acre on it according to its purity, quantity and depth, write a bulletin or two about it and everyone would forget it.

But when it is in Canada that is just what Canada cannot do. Everyone proceeds to open it and clamor because it cannot be transported to the distant markets of the country. The operators suffer from the insurmountable obstacles and look to the government to help them out of the economic blunder they have made. The investment looked like patriotism to them, but was it? They sought to fill a need that did not exist. A mine without a market is as unprofitable as one without mineral.

The frontier of manufacturing moves slowly. As Mr. Geddes recently remarked in these pages: All would have been well if Columbus had discovered Vancouver instead of San Salvador. The march of empire would have moved eastward and Utah, Colorado, British Columbia and Alberta would have been leading manufacturing centers, and farmers would be breaking new farms in Quebec, Vermont and New Hampshire.

But unfortunately for the West, Vancouver and the Golden Gate were discovered later, and so the roping

of steers is being done in British Columbia and Alberta, in Colorado and Utah rather than in Ohio. Facts are facts and as a result the Western coal fields in Canada and the United States will continue to have scattered development. Why make, therefore, so much fuss? Coal is not coal where distance prohibits its mining.

## Breaking Down Bone Coal

**W**HAT TO DO with middlings, the coal that is high in ash but has fuel value, is one of the difficult problems of the coal operator, the more because so many companies are now buying power and can no longer solve the problem by using this inferior coal in large measure in their own power plants. In fact, it is the irony of fate that the central station came into active being just as the operator was beginning slowly to learn that he should use the middlings and the pyritic coal for his own needs. He began to buy power just too soon to learn what a wealth of opportunity existed in his unsalable coal. If he had taken earlier to stokers and pulverized fuel he might not have succumbed so readily to the blandishments of the power salesman.

What now should he do with his middlings or bone? We will not say he should invariably crush and clean them. Whether in any particular case the middlings should be disintegrated by crushing and an attempt be made to set their good coal free much depends on the character of the material thus offering itself for treatment. If the crushing fails in any large degree to break apart the coal and the ash because their admixture is intimate, crushing and cleaning will not help him. If the price of cleaned fines is too small to pay for treatment, with interest on the equipment and payment for depreciation plus a small profit, he cannot be recommended to make the attempt especially seeing that these operations reduce the tonnage. But if he can obtain by this method a fuel for which the market is greedy as is the case of the producer of a coal used extensively for stokers—a low volatile product—he is justified in preparing it and indeed may be well advised if he increases the percentage of middlings including in them the "off-color" coal that he has been putting in with that of greater purity, thus decreasing its marketability and possibly its price.

It is a matter for careful consideration and for test. One is foolish to dogmatize. It would be better to construct, as a metal-mining company would, a pilot plant that would indicate what might be attained by a truly commercial operation. Some companies, at least, should find the practice highly profitable, and we look for it to become more general.

However, care must be taken to clean the fine coal in a plant so constructed that it will not waste the crushed coal by its inefficient operation or by letting the cleaner coal pass away as discolored water. The inability of some jigs to clean fine coal and the unwillingness of the market to accept the product and, what is the same thing, its inability to use it has prevented this crushing in the past. Time has changed this condition. Some users, particularly those that pulverize coal, prefer the fine sizes, and washing facilities have improved. Consequently we look for progress in this direction, especially in the South, where even in the depth of their winter season the coal will not freeze in the car. In the North dry preparation would obviate the disadvantage inherent in wet coal.





*Boncarbo Coal Tipple of American Smelting & Refining Co.*

## V-Panel Mining Progressing in Southern Colorado

West Virginia System Minus Conveyors Is Transplanted to Boncarbo Mine of American Smelting & Refining Co.—Tracks Are Kept Parallel to Faces in Each V—Roof Gives Trouble but Cost of Coal Is Cut

By E. W. DAVIDSON  
Associate Editor, *Coal Age*,  
Chicago, Ill.

**M**INING by the V-system has caught the imagination of almost every coal-producing company in this country. Many companies have studied its possibilities as applied to their own conditions, but only a few have actually gone underground and tried it out. One of the few is the American Smelting & Refining Co. with a coal mine at Boncarbo, Colo., a few miles back in the hills from its coking plant at Cokedale in Las Animas county.

There, for nearly a year, the V-system has been on trial; not with conveyor transportation of coal from the face, as in Everett Drennen's original V-system installed in the mine of the West Virginia Coal & Coke Co. but with cars and tracks. Many obstacles have arisen, some of which have not been overcome; but, in the words of H. H. Bubb, general superintendent of the mine and the coking plant, "considerable economies of mining have been effected, and we are going ahead with the work." If the system works well enough, the use of cars probably will be continued, as 1,200 tons a day is all the company wants to produce at present, but if conveyors are considered necessary they will be installed later.

The Boncarbo mine is a comparatively new property upon which the company relies for coal to supply its 350 beehive coke ovens at Cokedale. The mine now employs between 250 and 300 men. The thickness of the coal varies from 4 ft. 6 in. to 5 ft. 6 in. and is comparatively free of dirt partings. The mine has six locomotives for gathering and one for main haulage

and has one of the best systems of heavy trackage in the West.

The experiment in V-mining started in the Boncarbo mine in March, 1924. Mr. Bubb and his mine superintendent, C. R. Garrett, had visited the Norton mine in West Virginia to see the original American V-system there, and other engineering talent had been devoted to the problem of transplanting V-mining to Boncarbo. The plan adopted was almost identical with that used at Norton except that no conveyors were installed.

The start was made in a piece of coal on the first left off the main west. This location was chosen because mining in that territory by the usual room-and-pillar method had reached that particular coal, and also because it was reasonably close to the outside and therefore handy for inspection.

### PIONEER WORK REQUIRED MUCH TIME

It was decided to work three blocks at once in this initial panel, thus providing six working faces. Three entries, 8 ft. wide and at 80-ft. centers, were driven up 300 ft. to a barrier pillar and then widened out to form three V's on 45-deg. angles. This pioneering took a good deal of time and had all the other disadvantages of narrow work, but it eventually opened up the six faces, each approximately 90 ft. long.

Tracks were laid in each entry with a switch at the throat of each V, two lines of track diverging from the switch to parallel the faces. The face tracks were laid 6 ft. from the coal and were moved after every



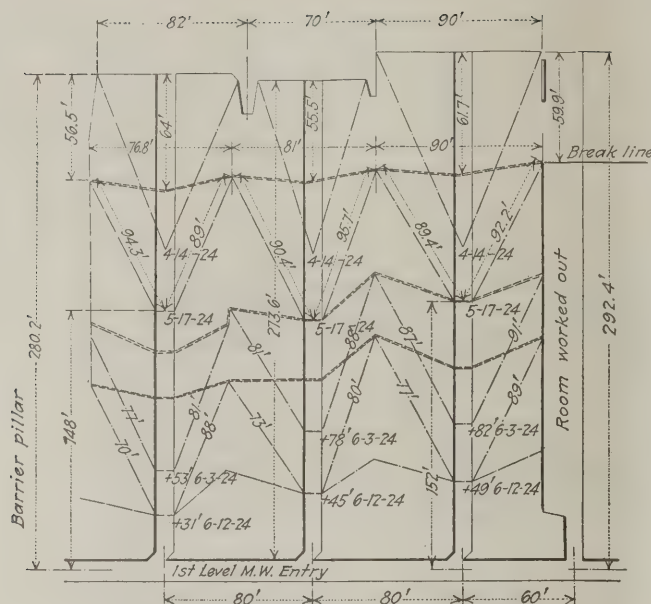


Fig. 1—Boncarbo Mine's First V-Panel

This was started in March, 1924, and was worked in stages shown by the progress dates entered at the throat of each V. The cross entries leading back from each V were spaced on 80-ft. centers but the angles of the V's were not uniform. The first effort was to break the roof in a straight line. This did not work so well and break lines thereafter were angled slightly to conform to the V's with better luck.

second cut had been loaded out. On each of these tracks as many as eight cars could be spotted at one time, but in practice this number varied from six to eight.

The crew working the trial panel was composed of seven company men and fourteen loaders. The seven company men comprised two trackmen, two timbermen, one machine runner, one helper and one shift boss. The twenty-one men includes every one working in the V-section except the driver of the gathering locomotive. Their efficiency improved greatly after they had been at the work for several weeks, proving that V-mining requires more than good engineering plans to operate successfully. The men doing the actual labor require some training, and much talent is necessary to co-ordinate the activities of the various groups.

It was planned that one mining machine should cut the two faces of one V each day, while the adjoining V was being loaded out by the fourteen men of the shovel crew. Simultaneously, the third V, which had

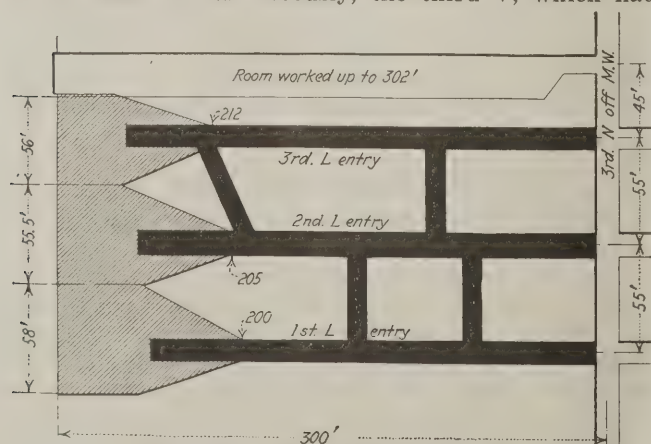


Fig. 2—How Chain Pillars Were Drawn by V-Mining

This illustrates the method followed in the triple entry that had been opened along one side of the second territory that was converted to V-panel mining, in the Boncarbo mine.

been cleared up the preceding day, was being worked by the timbermen and the track gang. Thus the three divisions of the crew rotated from V to V.

This plan, of course, made no provision for simultaneous driving of the narrow entries to prepare in advance for V-mining in any other block of coal. However, the ordinary cutting machine can cut so much more than 180 ft., which was a days' assignment for the Boncarbo machine, that the machine runner and his helper might also have driven entry with a short-wall machine had opportunity been provided.

#### LARGE DAILY OUTPUT PER UNDERGROUND MAN

The coal in the V-panels was undercut with a machine having a 7½-ft. cutterbar, each cut being of an average depth of 7 ft. During the whole period of about two months which was devoted to this territory, an average cut provided 126 tons. It was possible for the mining machine to make two cuts per week on each face so that the output of the six faces, when they were working every day, averaged 1,500 tons per week.

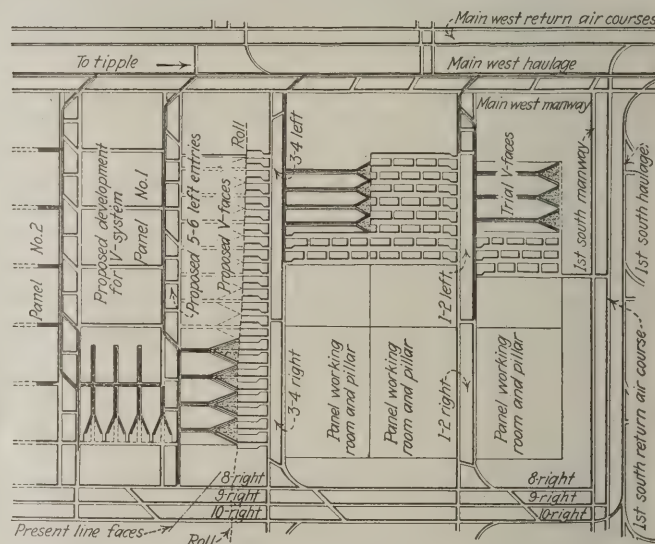


Fig. 3—This Is Boncarbo's Eventual Plan

If the mine is converted to V-mining completely, territory will be opened up probably to the barrier pillar of the nearest main entry, as shown here, with V-faces in panels retreating. A 12-ft. roadway will lead back from the throat of each V to laterals cutting the panels every 300 ft. These deliver coal to a heading at the inbye side of each panel. The chain pillar in this heading is cut back by a V-face kept in line with the rest of the panel operation.

The exact average per loader was 17 tons daily, but considering that there were twenty-one men working the territory and getting out approximately 1,500 tons a week, the daily output per underground man would be 12 tons. This is materially better than the average daily output per underground man in the mine on a room-and-pillar basis, which for a year has been wavering from 4.7 tons to 5.3 tons.

However, the V-system encountered difficulties from the start. In the first place the 8-ft. entries were so narrow that the throats of the V's were choked. There was insufficient width for placing the switches and to permit the machines to sump in. So it became necessary to round off the throat when each cut was made. This was overcome in later operations by driving up the entries 12 ft. wide instead of 8 ft.

As might be expected the roof afforded another important difficulty. The coal was immediately overlaid with draw slate ranging in thickness from 3 to 4 ft. This would come down without difficulty but above



it was a heavy sandstone stratum which would not break "according to Hoyle." The worked out area produced by the retreat of the three V blocks was approximately 240 ft. wide. This was too great a span for the sandstone. It was not strong enough to support itself firmly, and it was too strong to come down at the break lines.

The plan was to bring down the roof after each 50 ft. of retreat. When the first 50 ft. had been mined out a single row of timbers set skin to skin was erected in line with the points of the V's. But the roof would not cave at this line. It crushed the points of the V's and some coal was lost. So a stronger double break line was constructed, using 4x5-in. cap pieces 4 ft. 6 in. long. The two parallel lines of props under these cap pieces were 3 ft. from center line to center line. The line was no longer built straight across the room, but was bent in at a slight angle toward the throat of each V. This system was only moderately successful.

Then the break line was erected at 80-ft. intervals instead of 50-ft. The worked-out area was kept timbered stoutly until the full 80 ft. of depth had been attained. Then, with the double break line in place, the forest of props beyond it was pulled, with the idea that a cave would thus be made inevitable. In one attempt 636 props were removed, and the area left unsupported, but nothing happened.

After waiting for a time without result, a new type of break line was constructed with the idea of protecting the points of the V's when the roof finally should come down. A triple line of timbers was set skin to skin and this today is counted on to produce breaks at the desired places. Timbers are used liberally in front of this triple line to hold each roof area until the coal faces have retreated a safe distance. Then these props were pulled and the break line is expected to produce results. Much timber is used in each V between faces also. The timbermen are expected to keep the front row of props within 6 ft. of the coal.

Each time the face track is moved, it is laid inside the front row of props but before the second fall is loaded, new timber has been set between the track and

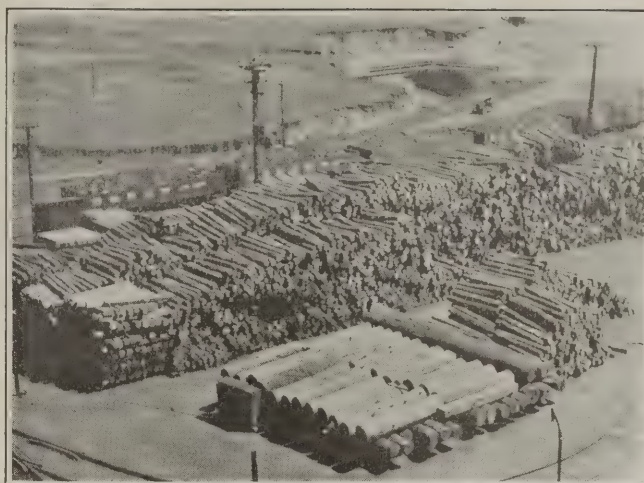


Fig. 5—Prop Yard at Boncarbo Is Well Stocked

But in spite of this heavy storage of timber it is a fact that in those sections of the Boncarbo mine where V-panel mining is in operation, the timber cost per ton of coal is "several cents" less than it is in the room-and-pillar territories.

the coal and loaders must shovel through it. This is not regarded as a serious handicap, however, and does not materially reduce the speed of loading.

Although the appearance of the territory being worked by the V-system gives the impression that much timber is necessary, the fact is that the cost of timber per ton of coal produced is several cents under that incurred in the main body of the mine where the coal is removed by the room-and-pillar method.

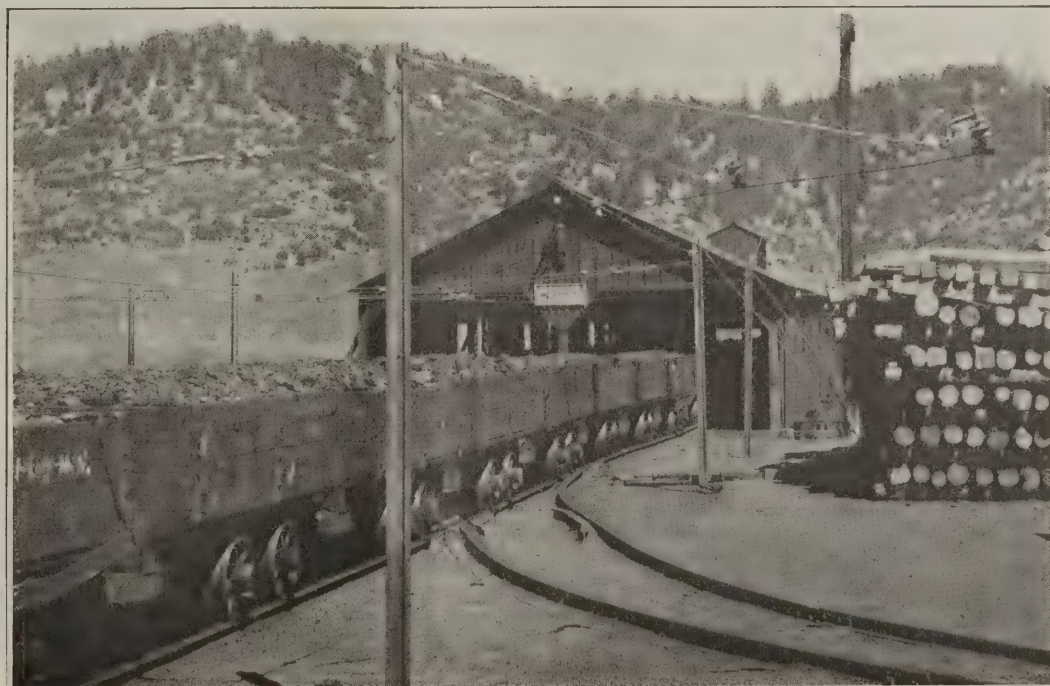
The roof difficulty was such that in the new areas now working the V-system, panel entries are laid out on 60-ft. instead of 80-ft. centers so as to reduce the distance between V points thus decreasing the roof pressure on each. The angle of each V is narrowed down also in order that the faces may maintain their full length of 90 to 100 ft. This does not obviate all roof trouble, but it has reduced it greatly, and the operators hope that the method will work successfully throughout the mine in case the whole mine is worked on the V-system.

The effort now is to finish out territories that are

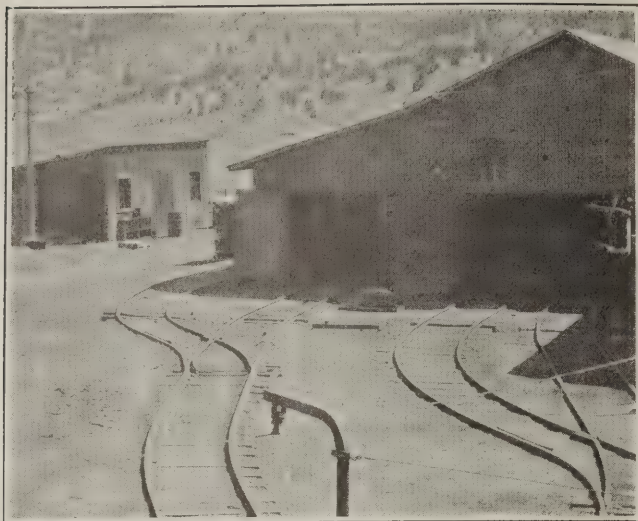
FIG. 4

#### Coal from V-Panels Reaches Tipple

Heavy double main-line trackage steadies the movement of coal. When a trip reaches the tipple, it is coupled to the end of the string of loads standing there. A car haul feeds the loads to the dump. Empties are delivered by a kick back to the tail end of a string of waiting empties. From this string the main-line locomotive takes its empty trip. Overhead construction is made permanent by the use of steel rails for poles.







**Fig. 6—A Clean Yard Bespeaks a Well-Ordered Mine**

This yard with the repair shop at the right and a storage building at the left, gives some idea of the orderliness which prevails throughout the Boncarbo mine. "Spick and Span" are two of the best employees Mine Supt. C. R. Garrett has. The yard tracks are carefully laid out and kept in alignment.

partially worked by room-and-pillar so that unworked areas can be laid out for V-faces only. When that time comes, if it ever does, the active areas will be operated in panels each 250 ft. wide and 1,500 ft. long (Fig. 3). V's in sets of four to each panel will be started at the boundary and retreated. An entry 12 ft. wide leading back from each V will connect with lateral entries cutting each panel at intervals of 300 ft. The 12-ft. roadways will be kept driven back far enough so that laterals can be discarded and wiped out by the retreating V's, the haulage from each V being carried back through the new roadway to the next lateral. Chain and barrier pillars are taken simultaneously with the panel coal so that theoretically at least, extraction is complete.

In spite of the troublesome roof and other obstacles and without the conveyor which has helped to make the Norton, W. Va., mine famous, the Boncarbo mine already has shown that V-mining can be made profitable if it is intelligently done. In the Boncarbo system, the ratio of miners to company men is only 2 to 1, whereas in room mining throughout the rest of the property it is 4 to 1. However, this is no certain

indication of the reduction that could be made in the force of men necessary to get out the 1,200 tons daily that the mine must produce. It is difficult to figure what additions to company men would be necessary if the whole mine were on a V-basis.

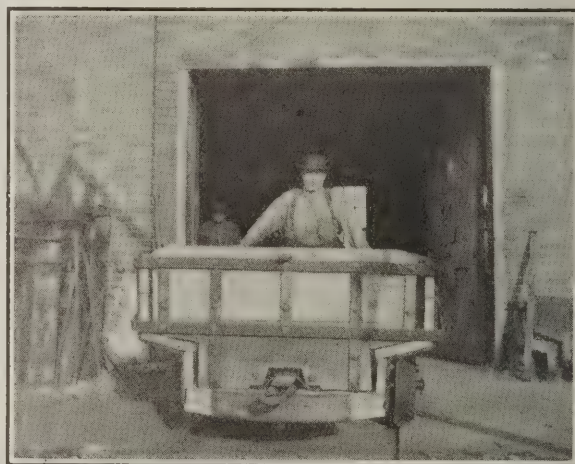
However, it is definitely proved that coal from the V-panels has been produced at somewhat less cost than coal from the rest of the mine and that a given tonnage certainly can be mined out of a much smaller area than has ever been obtained by any room-and-pillar system, with most of the advantages that are to be had from concentration of operation. And judging from the company's experience, its production can be handled readily with cars instead of requiring face conveyors. Whether the Boncarbo system of roof control is sufficiently dependable to justify conversion of the mine to V-mining remains to be determined. But at least the men of the mine have proven that V-mining has its possibilities outside of Norton, W. Va.

## Mine Car Built in Less Than 3½ Hours

BY O. F. TAYLOR

Superintendent, The Elm Grove Mining Co.,  
Laferty, Ohio

In the July 31 issue of *Coal Age*, p. 154, appeared an account of the feat of Joseph Martin of the New River Co., Whipple, W. Va., in building a mine car in 5 hr. 8 min. At 8 a.m. on Oct. 30, George Hess of the Elm



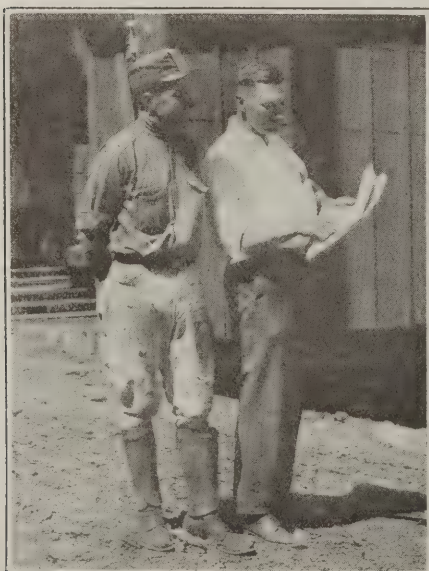
**The Car and the Man Who Built It**

This car is of about 2½ tons capacity. It is of the well-known 3-belt type such as is used in thousands of American coal mines. In fact there is nothing unusual about this car except the time required in its construction.

Grove Mining Co., Laferty, Ohio, started building a somewhat similar car and at 11:25 a.m. had it completed. The work on this car thus required 3 hr. 25 min.

All the material entering into the construction of this car was collected and assembled in the above time, Mr. Hess doing all this work himself with the exception of sawing the ends from three planks each 3x12 in. and 9 ft. long. These were held by the blacksmith Andy Kovach while their ends were shaped with a saw by Mr. Hess to receive the bumper irons.

In building this car 143 holes were bored and an equal number of bolts and nuts employed. The capacity of this type of car is approximately 4,500 lb. Mr. Hess is 58 years of age and weighs about 250 lb. He has been employed by the Elm Grove Mining Co., Oco Mine, Laferty, Ohio, as car builder and repairman for five years. The accompanying illustration shows the car and its builder.



**FIG. 7**

### The Men Who Run Boncarbo

At the right in a white shirt is H. H. Bubb, general superintendent of the mine and the 350-oven beehive coke plant of the American Smelting & Refining Co. at Cokedale, Colo., five miles away. With him is C. R. Garrett, mine superintendent.



# Plant in Newark Makes Briquets by Trent Process

Uses Screenings and Sweepings from Anthracite Yards—After Pulverization Coal Is “Amalgamated” with Oil Forming Pellets Reducing Ash Over Sixty Per Cent—“Amalgam” Is Then Briquetted—Advantages and Uses of Product

BY FRANK H. KNEELAND  
Associate Editor, *Coal Age*  
New York City

ONE OF THE treatments designed to remove a large portion of the ash contained in raw coal is known as the Trent process. A small plant but one nevertheless of commercial size operating on this principle and intended for treating anthracite yard screenings, culm, silt and the smaller steam sizes has been erected recently in Newark, N. J. The Trent process proper aims at material ash reduction, but this plant in Newark will eventually go much further and briquet the purified product, making it into an excellent domestic fuel in many respects superior to the best prepared anthracite.

Naturally, in the vicinity of such a center of population as New York City, where much anthracite is burned, a large quantity of screenings is available. It is the intention to utilize this material, which is both abundant and cheap, in this plant, which is being operated by the Superfuel Corporation of New York.

At present coal-yard screenings are being delivered by barge to the plant, which is situated on the bank of the Passaic River. Upon entering the plant the raw material containing from 18 to 30 per cent of ash is passed through a rod mill by which it is pulverized. The mill is fed by means of a spiral segment of pipe attached to the mill trunnion and revolving with it. At each revolution this dips into a tank or box containing coal, scoops up a certain quantity of it, and delivers it to the mill.

## PULVERIZED MATERIAL ENTERS AMALGAMATOR

After leaving this mill, the ground coal is passed to a Dorr classifier which removes the coarser material, returning it to the rod mill for regrinding. Fine material or that small enough to pass a 100-mesh sieve is flushed from the classifier to the churn or amalgamator. This is a tank separated into several interconnected compartments by suitable partitions or baffles. Each compartment is provided with an agitator or paddle wheel, and all are mounted on a common shaft extending the entire length of the tank. The arrangement of baffles is such that the material in the tank passes progressively from one compartment to that succeeding, over one baffle and under the next.

To the mixture of powdered coal and water entering the amalgamator a small quantity of oil is added. The entire mixture consisting of water, powdered coal, powdered ash-forming material and oil is then violently agitated by the paddles.

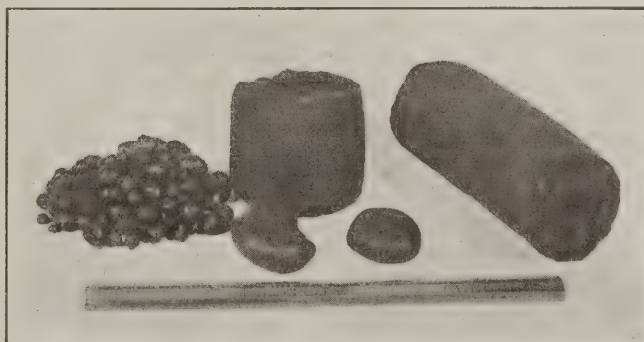
Under this action the oil will adhere readily to the coal particles but not to those of earthy matter or to the ash-forming constituents of the original coal. Furthermore, coal particles acted upon by oil, when agitated, will coalesce, amalgamate, or agglomerate into nodules or pellets, the size of which vary from that of a small shot up to that of a walnut or small hen's egg.

These pellets of coal amalgam are readily withdrawn

from the discharge end of the amalgamator, elevated and discharged to a dewatering conveyor. After draining on this conveyor they are delivered to another that discharges them to a storage pile. Ash-forming material is readily flushed out of the amalgamator and run to waste.

The pellets of pulverized coal as they come to the storage pile are not hard and unyielding but may be readily crushed in the hand or between the fingers. Though composed chiefly of oil and coal, they naturally contain some water. This gradually dries out upon exposure to the air.

The product of this process, the “amalgam” pellets, may be burned in a boiler furnace without further treatment. This fuel is being consumed under the



Pellets and Briquets as Made at Newark

On the left is shown a pile of raw anthracite pellets as they come from the agitator. In the center foreground are two baked pellets made from Rhode Island anthracite. Behind them is a bituminous briquet from which much of the oil used in the treatment of the coal has been expelled by baking, as well as some of the volatile matter. On the right is a baked anthracite briquet, ready for the market. Such briquets in a domestic fire burn evenly to a fine clinkerless ash.

boilers of the Titan Iron Works, the power station of which adjoins the coal-treating plant.

For utilization as a domestic fuel, the amalgam requires further treatment. To this end it is pressed into briquets by being passed through an extruding machine. From this it is ejected through circular orifices, the material thus forced out being cut to the required length. These pieces are then passed into a Vandergrift retort through a preheating chamber at a temperature commencing at 200 deg. F. and ending at 1,000 deg. F. During this process the oils and other byproducts are extracted.

Briquets made in this manner are hard and waterproof, make a hot, glowing fire, and do not crumble or change shape until they are entirely consumed. The small quantity of ash is extremely fine and no clinkers are formed. When burned in an ordinary stove, the fire may be banked and retained for 24 hours, without any attention whatever. A fire of this fuel also is slightly more flexible than one of raw anthracite, that is, it will respond somewhat more quickly to a change



in draft. The refuse or ash passing through the grate analyzes only 2 per cent of combustible matter. This is only a fraction of the combustible matter usually passing the grate when ordinary coal is burned.

The important characteristic of this process is the fact that the ash in the original coal is greatly reduced. Tests conducted on various coals show a varying degree of ash removal. Thus, treatment of the anthracite screenings in the manner described reduces the ash from about 18 per cent in the raw material to approximately 6 per cent in the finished briquet. Treatment of Rhode Island anthracite reduces the ash from approximately 30 per cent in the raw material to as low as 8 per cent in the pellet or globule, thus effecting the removal of 72 per cent or practically three-fourths of the total inert matter. Treatment of other coals, both anthracite and bituminous, affords results of a similar nature but varying in effectiveness with the ratio of inherent to extraneous ash in the coal treated.

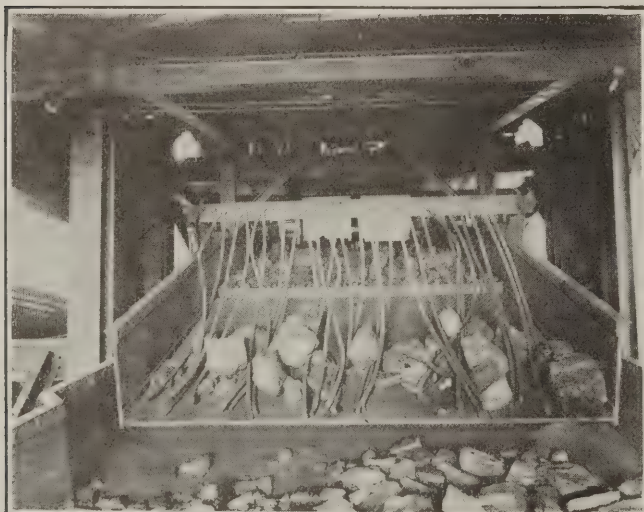
#### MANY FIELDS OPENED BY TRENT PROCESS

Commercially the Trent process of coal purification opens many possibilities, the scope and limitations of which must yet be determined. Thus the pellets may be fired into the ordinary boiler or metallurgical furnace either by hand or by automatic stoker; dried and again reduced to a powder, they may be burned in suspension in air as pulverized coal.

When briquetted coal treated in this manner forms an excellent domestic fuel, being superior both in convenience and in heat content to the raw material from which it is manufactured.

Time alone can determine the extent of the possibilities involved but it will undoubtedly make available large quantities of low-grade and now wasted coals. It is the intention of the Trent Superfuel Co., to proceed immediately with the erection of a large commercial plant in Newark, retaining the present installation as an experimental or "pilot" plant wherein will be determined by actual trial the characteristics of various coals and the details of processing that they must receive.

### Slowing Down Coal to Lessen Breakage



Shaker Screens at Red Jacket Consolidated Coal & Coke Co., Red Jacket, W. Va.

These screens are installed at a tippie on the Mitchell Branch. When the coal leaves the screen and gets on the smooth plate beyond it, it tends to travel too fast and is slowed down by pieces of wire rope hanging from a cross-piece on the screen.

### Consolidation Transmits Power 70 Miles

The power plant shown in the illustration is the property of the Consolidation Coal Co., Millers Creek division, Van Lear, Ky. It is now shut down, displaced by a 70-mile transmission line from the Jenkins, Ky.,

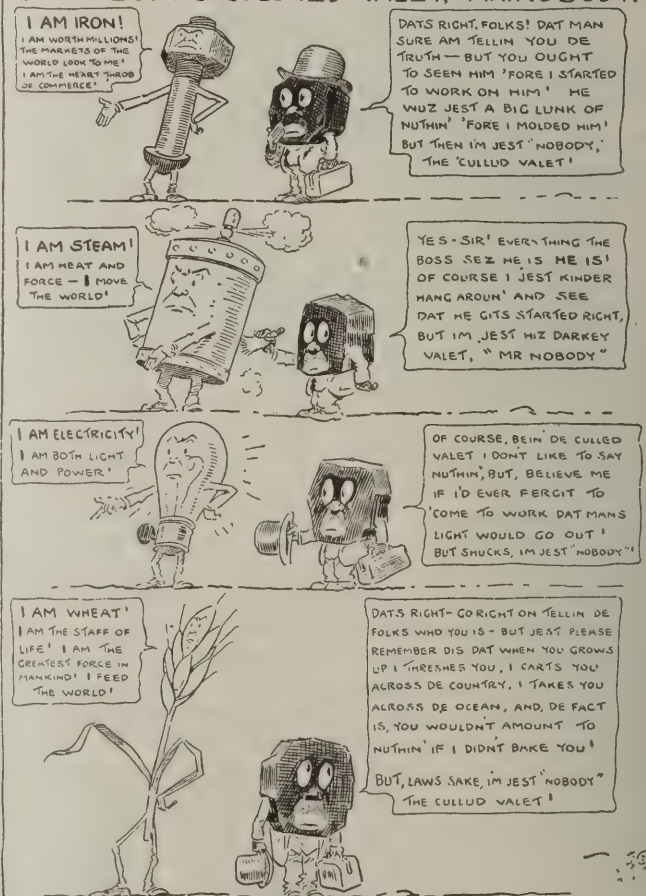


#### Closed This Plant to Bring Power from Jenkins

When the plant became overloaded the Consolidation Coal Co., closed it and brought in power from its Jenkins Mines, the line supplying mines and villages in its course.

plant of the same company. The Van Lear plant was built in 1911. Becoming overloaded, rather than to add to the capacity, the company decided to build the power line, and an arrangement was made with the Kentucky-West Virginia Power Co. to tie into the coal company's line from 6 a.m. till 4 p.m. The Jenkins plant now has 4,000 kw. rated capacity but can carry 6,000 kw. for short periods. The power company furnishes about 9 per cent of the total power that the company uses.

### EVERYBODY'S COLORED VALET, "MR. NOBODY."



#### Introducing "Mistuh Nobody"

Here we have the *Illinois Journal of Commerce's* idea of the service humble coal performs. It is difficult to understand, however, why the creator of this cartoon did not also picture "Mistuh Nobody" as the arch crook robbing the henroost of the householder, and also as the goat of Washington, D. C.



# Controls That Enable Pumps, Hoists and Electric Shovels to Simulate Human Direction

Pump Control Watches Water Level and Shuts Down When Water Is Low — Hoists Automatically Use Power so as to Avoid Electric Peak Loads Which Have to Be Paid for When Power Bills Arrive

BY F. L. STONE

Industrial Engineering Department, General Electric Co.,  
Schenectady, N. Y.

**A**LL MINES must have a drainage system of some sort. In many operations the problem of keeping the mine free from water is one of the most difficult and most expensive of all the many to be confronted. Consequently, we find inside some of our large mines enormous pumping plants, and sometimes the capacity is large enough to supply a fairly large city. The water pumped is usually acidulous to such an extent that in many instances pumps have to be made of special and expensive acid-resisting metals.

Pumps are divided into two general classifications, namely; the multi-cylinder plunger pump and the centrifugal pump. The former requires a moderate-speed motor which is usually geared, whereas the latter calls for a high-speed motor arranged for direct connection. The motor must have moisture-resisting insulation and must be carefully constructed, particularly as to the insulation of its coils.

The atmosphere of an underground pump house is usually humid, and unless special precaution is taken the coils will breathe, taking in moist air which is deposited inside the coils and tends to weaken the insulation. The larger electrical manufacturing companies have designed a standard line of high-speed induction motors for driving centrifugal pumps.

There are no special features connected with the speed of pumps as they are usually run at constant speed until the sump is brought to the required level, after which they are shut down either automatically by means of a float switch or by hand.

Some of these pumping stations have been made fully automatic and arranged so that when the level of the sump rises to a predetermined height, a priming device comes into play which primes the pump. After the priming is accomplished the main driving motor is thrown across the line and the pump started. The main motor cannot start until the pump is primed. Should the pump lose its suction for any reason, the equipment automatically shuts down. The most up-to-

date installation of this sort, is in one of the mines of the Philadelphia & Reading Coal and Iron Co.

The selection of the proper centrifugal pump for a given job should receive careful consideration. Pump manufacturers list the same pumps for various speeds and heads. The efficiency curve of a pump in most cases shows a definite maximum and a rapid falling off either side of this point of highest efficiency. If a

pump is selected to operate at a speed different from that which affords the maximum efficiency, the result, irrespective of the drive, will be an inefficient installation.

In many wet mines we find what are known as gathering pumps which consist of small portable equipments that can be moved about the mine to take care of local flood conditions. These gathering pumps are usually small plunger type units and manually controlled, being driven by an induction motor or a direct-current motor taking power from

## ELECTRICAL WATCHMEN

**E**LECTRICITY used to be synonymous with trouble. If an operator installed electricity he got things done, but only if he continually kept after his electrical problems — and they were many and perplexing. But today the machinery does much of the watching itself, and it fails most and wastes most when left for any reason to the care and judgment of a workman. Automaticity removes the human element. Men are just about as often obstinate and misguided as they are negligent and absentminded. The electric controller is the incarnation of the mind and purpose of the designer and is constituted so that it simply can't be in discord with its master's purpose.

the trolley line or separate circuits for the purpose.

Of all the problems connected with the mine that of the proper selection of the hoist is perhaps the most interesting. Electric hoists have long since passed beyond the experimental stage and have innumerable times demonstrated their greater economy as compared with any other form of hoisting.

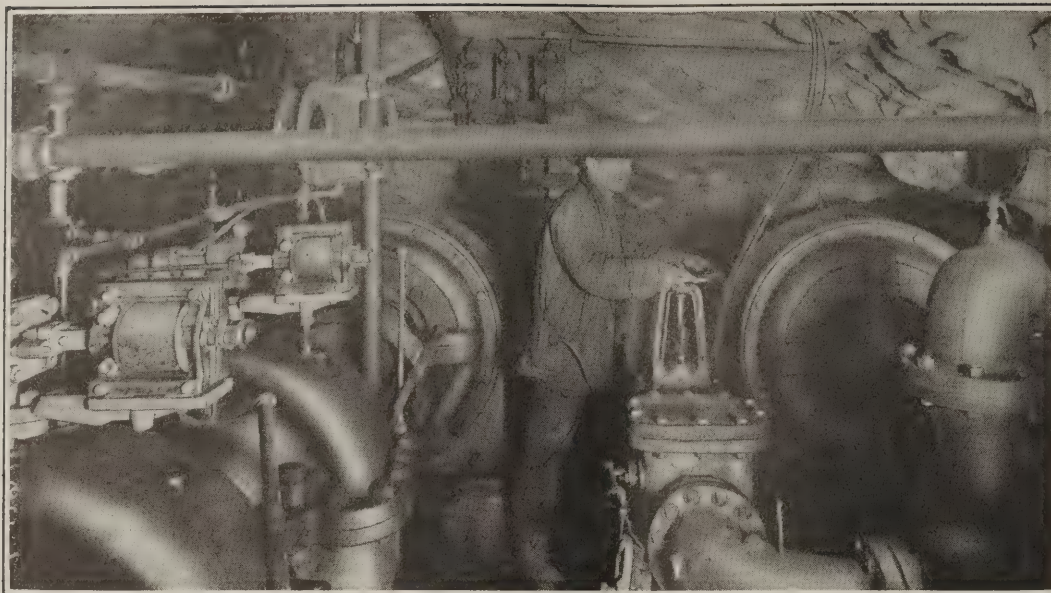
The electrical engineer is no longer asked to compare the economy of the electric hoist with that of the steam engine. One manufacturing company has, within the past fifteen years sold 230,000 hp. in electric hoists divided among 450 units. The only problems now to be solved are, How large the drive for the hoist shall be?; What is the best shape to make the drum?; and, finally, What is the best control system for the hoist? The question of size can be readily determined from the duty cycle. This duty cycle can be calculated with great accuracy.

## CYLINDRO-CONICAL DRUM MAY CUT RATING

The best shape of drum can be determined only after several duty cycles have been made using various shapes. In many instances, a plain cylindrical drum is necessary. This is particularly true if hoisting is to

From a paper on "Electricity in Mines," read at Pacific Coast Convention of the American Institute of Electrical Engineers, Pasadena, Cal., Oct. 13-17. Parts of the same paper will be found in *Coal Age*, Nov. 6 and 13.





### When Mines Have Many Cave Falls

During rainy seasons in the anthracite region no Moses' rod is necessary to strike the rocks for water. At some places many of the beds outcrop and it is an easy matter for the water to enter the mines. Even where there is a heavy rock cover the cracks in the cleavage planes permit large volumes of water to enter the mines.

be accomplished from more than one level. The conical drum and the cylindro-conical drum have only a special field of application, but in this field the proper selection of the shape is of quite vital importance. For instance, on short fast cycles the rating of the main-drive motor can be reduced as much as 35 per cent by the use of a cylindro-conical instead of a straight cylindrical drum.

With drums other than cylindrical, the upward moving load is started on the small diameter while the downward moving load starts on the large diameter. This difference in diameters reduces the starting torque materially, and in fast cycles the acceleration is frequently the controlling factor in the motor rating. This reduction of starting torque is therefore of great importance. There are limits, of course, beyond which it is not well to go in proportioning the large and small diameters.

The small diameter is usually fixed by the diameter of the rope. Conservative hoist engineers feel that the ratio of rope to drum diameter should not be less than

1 to 60, otherwise the rope will deteriorate quite rapidly due to the bending stresses. Thus with the minimum diameter determined, the maximum diameter is limited by the weight and consequent  $WR^2$  of the drum. It is easy to defeat the entire object of the drum by running its  $WR^2$  too high.

There seems to be no limit in the steepness of the spiral on which the rope climbs from the smaller to the larger diameter, drums having been constructed where the diameter increases as rapidly as 2 ft. per turn.

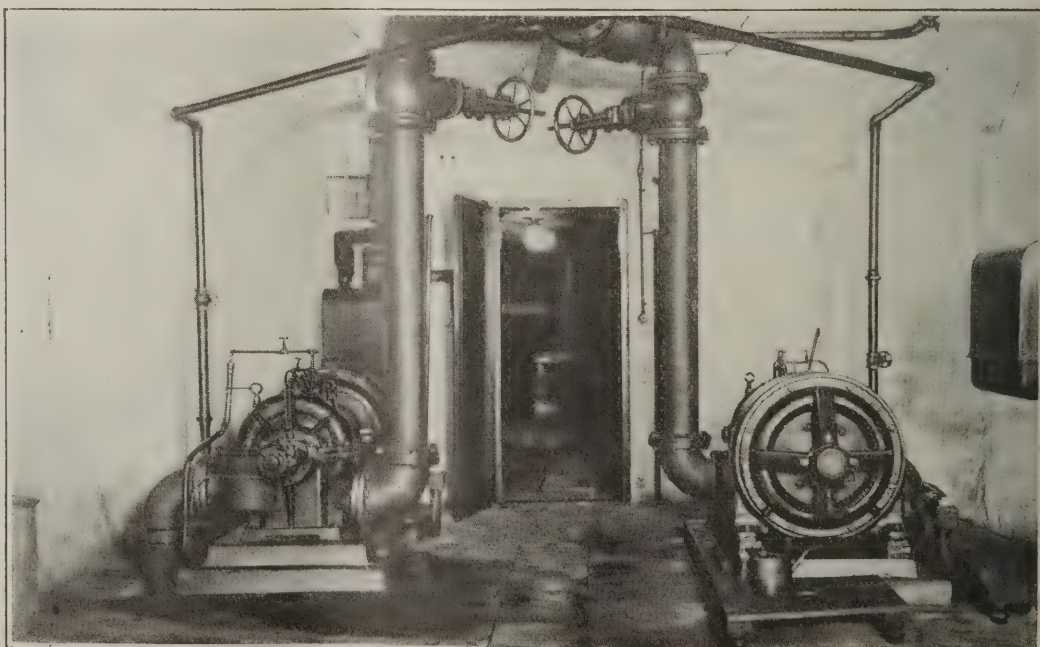
### HOIST CONTROLS DESCRIBED IN BRIEF WORDS

The conical and cylindro-conical drums assist also in keeping down the peaks in deep shafts where the weight of the rope is equal to, or as is frequently the case, far exceeds the weight of the material hoisted. By the adoption of the proper drum, the overbalancing effect of the rope may be nicely compensated and the starting load reduced materially.

As for the proper drive and control to use, we have

### Bituminous Mine Pumproom

The Springdale mine of the Allegheny - Pittsburgh Coal Co., Logans Ferry, Pa., makes about 500 gal. of water per minute. Practically all of this water drains or is pumped to a central sump which has a storage capacity of about 2,000,000 gal. Adjoining the sump area is the main pump station, shown here. Two centrifugal pumps, each with a capacity of 1,400 gal. per minute and driven by a 100-hp., 220-volt induction motor raise the water to the surface.





the choice of a single induction motor usually geared to the hoist drum through one set of gearing, or we have the direct-current motor driven from a motor-generator set with Ward-Leonard control, the motor-generator set consisting of a synchronous or induction motor set without flywheel.

Finally, we have a direct-current motor driving the hoist from a motor-generator set with Ilgner control. By Ilgner control, I mean an induction type motor-generator set with a flywheel large enough to prevent objectionable load peaks on the power line. Briefly, this control consists of a motor-generator set as above described and a slip regulator, which, as the load tends to rise above a predetermined value, inserts resistance in the rotor of the induction motor of the motor-generator set thereby holding the torque of the induction motor practically constant.

The load on the direct-current machine may call for

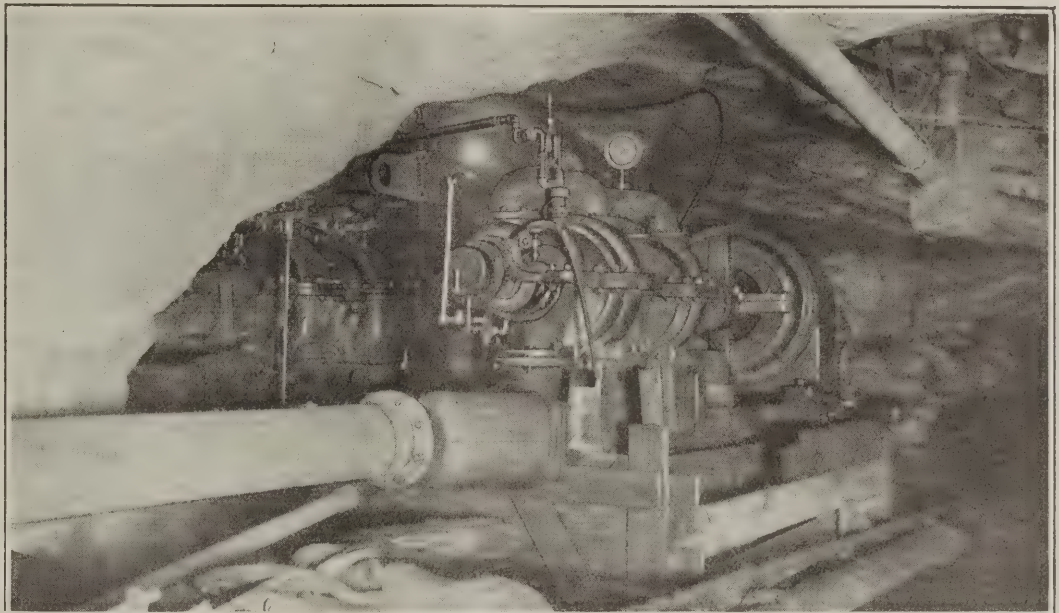
is connected across the collector rings and is cut in and out at the will of the operator by means of contactors operated from the master controller. The control is, of course, equipped with current limits so that the acceleration peaks will not go beyond certain predetermined values, but these peaks are directly upon the power plant, and no type of resistance will reduce them.

#### RHEOSTAT LOSS LOW WITH WARD-LEONARD CONTROL

In other words, acceleration of a given mass is to be accomplished in a given time, and it will require the expenditure of a certain number of horsepower-seconds. The acceleration of the hoist load by this method of control is exactly the same as the acceleration of any other load where a constant line potential is held. Approximately one-half of the energy taken from the line during acceleration will be dissipated in resistance.

#### Automatic Pumps

One of the greatest advantages of automatically operated pumps is the fact that they can be placed in remote sections of the mines and still be depended upon to function properly. In coal beds which are extremely uneven pumphouses must often be located in the solid rock. Here is one such station with two automatic pumps in the Buck Run Coal Co. mine near Minersville, Pa.



a much greater torque than the induction motor will exert. The result is the set will slow down in speed, the flywheel give up part of its energy. As soon as the load is removed from the direct-current end, the induction motor being considerably below synchronous speed will draw sufficient energy from the line to bring the set back to nearly synchronous speed and restore to the flywheel the energy it gave up during the heavy demand. A properly designed Ilgner system will keep the input to the hoisting equipment practically at a constant value, if hoisting is carried on at a constant rate, or it will limit the demand to any predetermined value.

Thus we have two distinct systems of hoist drive, one using a single induction motor of the slip-ring type with the speed controlled by a variable resistance in the rotor circuit. The second system involves a direct-current generator either direct-connected or geared to the hoist drums and a motor-generator set with or without a flywheel for driving the hoist motor. The second system naturally will cost three or four times that of the first. The question naturally arises, Why should the second system ever be used? The answer must be made from estimates of first cost and operating expenses.

The control of induction motor hoists is so simple that it needs little or no description. A large resistance

With the direct-current system using Ward-Leonard control there is practically no rheostatic loss, as the speed of the hoist is controlled by the generator voltage.

On short fast cycles this saving in acceleration losses amounts to so much that the difference in the kilowatt-hours per trip when using induction motor as compared with the Ward-Leonard is sufficient to warrant a large expenditure for the direct-current system.

Further, the direct-current system of control is much more flexible and lends itself a little better to the application of safety- and speed-controlling devices. The direct-current hoist can be run at reduced speeds with no rheostatic losses. This is impossible with the alternating-current hoist. It is impossible to state with any degree of certainty which system is the more economical until a thorough analysis of the problem is made.

Whether a flywheel is used for the equalization of the incoming power depends on two factors. First, if purchased power is used and instantaneous demands are penalized, then a flywheel should be installed. Second, if the hoist is to be operated from a small plant, either privately owned or a public utility, the addition of a flywheel will frequently be of such value in reducing the peaks on the line that even though the plant be small no additional capacity will be neces-



sary. This would not be the case if an induction-motor hoist or a motor-generator set without a flywheel were installed.

Due to the ease of control where the direct-current Ward-Leonard system is used it has been found feasible to install completely automatic hoists. By this I mean, a hoist which can be started from a push button in the morning and will run continuously for 24 hours or longer, without any manual attention.

#### SUITS ITSELF TO IRREGULAR WORK OF SHOVEL

Many coal deposits have been located so close to the surface that they can be obtained by removing the overburden. This system of mining is commonly known as strip mining. Large electrically-operated shovels similar to the steam shovel have been developed for this work. The largest in use at the present time is what is known as the model 350, meaning that the

entire weight of the equipment is approximately 350 tons. This shovel is capable of handling a 10-yd. dipper and has a boom 90 ft. in length. The duty on the motors of an electric shovel is probably the most severe encountered anywhere. They are continually starting and stopping and being subjected to heavy overloads. Notwithstanding this fact the electric shovel is rapidly coming into its own.

Most electric shovels have a motor for each operation, namely, the hoist, the swing and the crowd. These motors are run from individual generators which form part of a four-unit motor-generator set. The control is a slight modification of the Ward-Leonard, the difference being that each generator has a differential series field which limits the current output of the generator to a predetermined value. Thus it is impossible for the operator to abuse the electrical or mechanical apparatus beyond a certain point.

## Powdered-Coal Furnace No Longer an Experiment

Furnace Life Not Shortened When Pulverized Coal Is Used—Well Fitted to Automatic Control—  
Use Rapidly Spreading

THE SERIAL report covering the years 1923 and 1924 of the Prime Movers Committee of the National Electric Light Association, dealing with the use of pulverized fuel carries much of interest to the coal producer, who can by this means make use of much material that cannot be marketed or does not sell at a profitable figure. The mere fact that today the use of this type of fuel is considered when any new power plant is designed is abundant proof of the practicability of powdered coal in power-generating stations. During the past few years many refinements in furnace design have been made, and many of the shortcomings of earlier installations have been overcome. All of this tends toward greater reliability in operation.

Though powdered coal has attracted most attention by reason of its application to large central stations, its value to the small plant should not be overlooked, for it is here that the largest gains in efficiency are possible. This field is receiving much attention, particularly from manufacturers of unit systems, and the results reported in many cases indicate satisfactory improvement.

The report says in part: Adapted to boiler firing several years ago for purely experimental purposes, the use of pulverized coal has today assumed such importance that it is considered in the design of practically every large power station where coal is to be employed as fuel.

Used by itself, or in combination with other fuels, it should lend itself readily to the application of automatic control, this phase of the art already having been developed commercially to some extent. This feature is, of course, especially valuable when utilized in connection with a fluctuating load or with some other fuel supply.

Recent progress in pulverized-coal development has lain chiefly in refinements to existing equipment and in obtaining the most reliable and economical arrangement of apparatus from an operating standpoint.

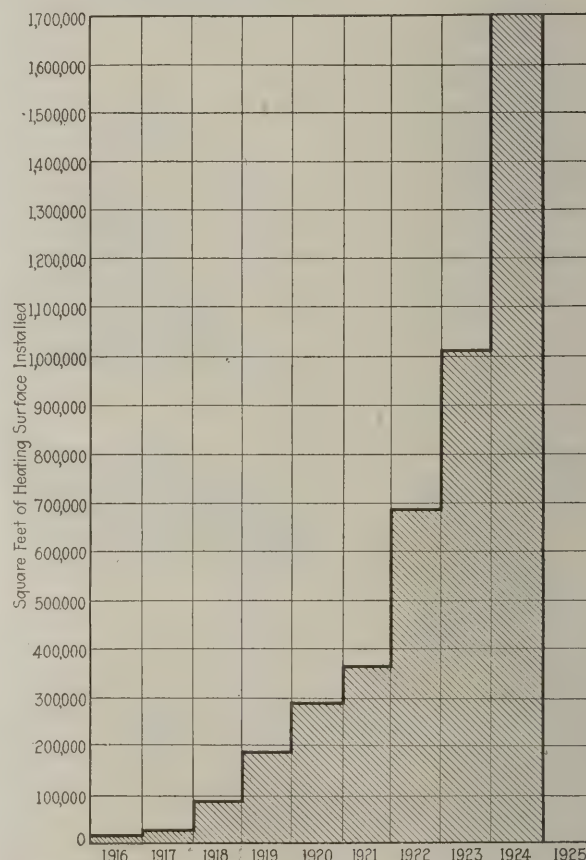


Fig. 1—Yearly Increase in Area of Boiler Heating Surface Fired With Pulverized Coal

These figures, compiled by the Fuller Engineering Co., show the rapidity with which pulverized coal has been adopted during the past few years. They show the area of heating surface in boilers fired with pulverized fuel either in operation or under construction. They do not show, it should be understood, the horsepower of such boilers.

Probably the most important developments embodied in the newer installations are the water screen, the waste-heat drier and the radiant superheater.

As engineers throughout the country become more familiar with the operation of this type of plant, much of the skepticism attending its use is being overcome, also certain difficulties at first encountered have been satisfactorily solved with the result that its adoption is now considered almost entirely from a financial angle,



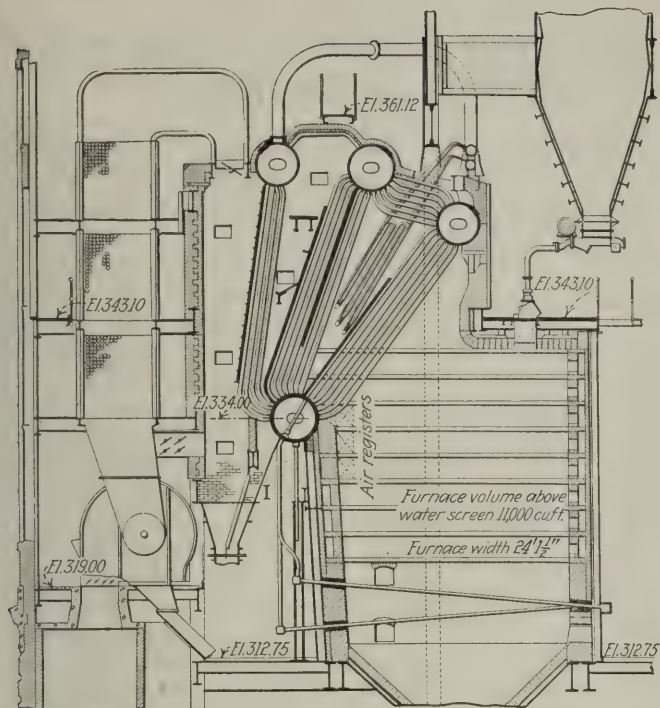


Fig. 2—Typical Powdered-Coal Fired Boiler

This particular installation is in the Middletown Station of the Metropolitan Edison Co. Although powdered fuel thus far has been used chiefly in large units it is equally well adapted to smaller ones. In order to avoid rapid deterioration of brickwork, furnace volumes must be made large.

the question of practicability being generally conceded.

As a stamp of approval that such a plant is both efficient and reliable it is necessary only to refer to the number of large companies that are either planning, building or operating central stations of large capacity using pulverized coal exclusively. Chief among these may be mentioned the Trenton Channel plant of the Detroit Edison Co., to consist of 6 sections of 50,000 kw. capacity each, the first to begin operation during 1924; the Cahokia Station of the Union Electric Light

& Power Co., St. Louis, to be built in four sections of 60,000 kw. capacity each, the first of which is now operating and the second is under construction; the third 60,000 kw. unit of the Colfax Station of the Duquesne Light Co.; the 1923 addition to the Lake Shore Station, Cleveland, Ohio, with a boiler plant consisting of four 3,060 hp. units; and the Lakeside Station, at Milwaukee, two units of which are operating, the first consisting of eight 1,333-hp. boilers and the second, now about 60 per cent complete, consisting of eight 1,828-hp. boilers.

#### GROWTH IN USE OF PULVERIZED COAL

The growth in the use of pulverized coal for boiler firing is best appreciated by reference to Fig. 1, which shows the yearly increase in square feet of boiler heating surface starting with 1916 as a base. The most noteworthy feature of this chart is the large amount of boiler surface under construction or contracted for during 1923. This amounted to nearly 70 per cent of the total for the previous seven years.

The question of furnace maintenance, which it was first thought would be excessive, seems to have been rapidly overcome, and today with proper proportioning of the furnace, air-cooled walls and water screens, there is no more to fear from this source of difficulty than there is with the use of stokers. Moreover, it is now becoming evident that the life of the furnace may actually be longer with pulverized coal than with stokers. This no doubt arises from the unusual care that has been expended on the materials used and on the refinements in furnace design.

FAIRBANKS, MORSE & Co. write us that the 100-hp. "kerosene" engine referred to in the M. H. Fies' article of Oct. 23, p. 577, should be revised to read "oil" engine, that company not making a 100-hp. kerosene engine.

#### Utah's Only Shaft Mine

This is the tippie at Castle Gate No. 3 of the Utah Fuel Co., three quarters of a mile above the town of Castle Gate. The famous "gate" of rock can be seen towering in the background. This mine, which is just getting into production, taps a seam 100 ft. below the valley floor. The tippie has a capacity of 1,500 tons a day. It is equipped with shaker screens and loading booms and is built with a wooden frame sheathed in corrugated iron. The mine has an electric hoist.





## Zeigler No. 1 Shaft Breaks World's Coal Production Record By Hoisting 189,240 Tons in Month of October

THE old Zeigler No. 1 mine of the Bell & Zoller Coal Co., in Franklin County, Illinois has won its place in the sun. In October of this year it produced 189,240 tons of coal. This is the greatest monthly output of coal ever hoisted from a single shaft in the history of coal mining. The great hoist constituted a daily average of 7,008 tons, or approximately 280 railroad carloads, which is a volume of coal sufficient to stagger the imagination at any time, but especially so during a period which is "low" in the coal industry. The fact that it was done is a tribute not only to the engineering and operating staff of the company but also to the sales organization, which is coming to be recognized as one of the most effective in the Midwest.

It is worthy of note that this mine made its great run without any considerable increase being made in either the number of men or in the equipment since the month of March, 1922, when it engaged in a tremendous production race with a nearby mine just before the beginning of the strike of that year. In that month Zeigler established the then world's record for monthly output by hoisting 164,085 tons, averaging 6,077 tons daily. The greatest single day's hoist that month was 7,586 tons. During the past summer the mine was down for about three months while some equipment such as boilers was replaced. However, the mine was not rehabilitated and began producing again this fall without any great increase in mechanical capacity. The company claims that the increased output was gained largely by better organization and higher efficiency.

This historic mine, which is one of the oldest in Illinois, has weathered many a gale, especially during its early years beginning in 1904 when, under the ownership and determined management of Joseph Leiter, it produced its first coal—4,240 tons. Anti-union policies of Mr. Leiter led to various rows with organized labor during which much underground trouble was experienced, ending in an explosion—the last of a series—which wrecked the mine and shut it down in 1908. In December, 1910, it was

reopened, this time under the management of Bell & Zoller, the present operators. Since then its production has mounted steadily as is shown in the accompanying table of production by years.

Up to Nov. 1 of this year the production of No. 1 mine totaled 812,312 tons as compared with 880,428 tons at the same date in 1923. But in 1923 the mine was not shut down during the summer as was the case this year.

The company operates another whale of a mine nearby—Zeigler No. 2—which had produced 1,175,215 tons of coal up to Oct. 31, and was going strong. It has hoisted as much as 6,983 tons in one day and 153,944 tons in one month. Its grand total production since it started late in 1919 is 2,567,131 tons. Thus

### HERE'S A CHALLENGE

HAS ANY MINE in the world, with a single hoisting outlet raised as much coal in its whole history as Zeigler No. 1 has raised since it produced its first coal in 1904? Zeigler No. 1's total for the whole life of the mine up to Oct. 31, 1924 was 12,632,615 tons. Thousands of mines in the world are older—some by 100 years or more—but has any mine made such a contribution to the fuel supply of the world? Bring on your grand totals.

153,944 tons in one month. Its grand total production since it started late in 1919 is 2,567,131 tons. Thus

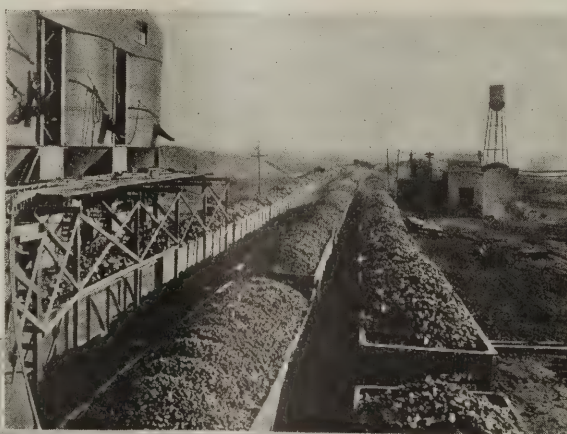
Annual Production of Zeigler Mine, Zeigler, Ill.

	Tons		Tons
1904.....	4,240	1915.....	816,929
1905.....	103,223	1916.....	965,187
1906.....	234,654	1917.....	937,503
1907.....	321,285	1918.....	925,002
1908.....	522,722	1919.....	1,043,956
1909.....	Closed	1920.....	959,358
1910.....	14,507	1921.....	1,155,278
1911.....	317,827	1922.....	770,716
1912.....	515,270	1923.....	1,023,009
1913.....	555,859	1924.....	812,312
1914.....	633,778		
			12,632,615

it is evident this company, from these two mines alone is capable of producing about 15,000 tons a day and about 340,000 tons of coal per month.

Illinois in its effort to reduce cost and promote efficiency is developing large and ever larger mines, the thickness of the coal, the levelness of the seam and the fact that the measures are seldom eroded and in most cases unfaulted, has made it possible with care in planning to bring large tonnages to the shaft bottom. But with all these favorable conditions we must not overlook the major consideration, the large viewpoint of the operator and the skill of the engineers. Both owners and managers have taken full advantage of the favoring conditions.

Well-Filled  
Railroad Cars  
in the  
Zeigler  
Tipple Yard



Fairy  
Headframe  
at Zeigler  
with Tipple,  
Rescreen  
and Shops



# Be Alert to Danger When Unwatering Coal Mines

Use Closed Lights or at Least Have Someone Examine Workings Thoroughly with Safety Lamp Before Men Are Put to Work Removing Water from Flooded Areas

BY L. D. TRACY

Superintendent, Central District Experiment Station,  
Urbana, Ill.

IN THE course of their investigations into the various causes of coal-mine disasters the U. S. Bureau of Mines' engineers have noted that several gas explosions had occurred during the unwatering of mines or shortly after the removal of the water. The coincidence was so marked as to suggest that an extra hazard was present, whenever water, which has been standing against the face of the coal for some time, is suddenly removed whether by natural drainage or by mechanical means.

A typical illustration of this hazard is shown in a gas explosion which occurred in a mine in central Pennsylvania. For main entries, 50 ft. apart with an average grade of 6 per cent, had been driven down the dip of the coal, and from these mains 7 pairs of entries, at intervals of 800 ft., had been turned at such an angle that their grade was slightly rising. From these latter pairs of entries, rooms were turned practically at right angles.

The main entries had been driven for 4,500 ft. and at the face the cover was 400 ft. thick. As far as could be observed, the roof was of sandstone and the floor of clay.

The coal bed being mined was the Lower Kittanning, which has a thickness of about 4 ft. A typical analysis of the coal in that section is: Moisture, 1.6 per cent; volatile matter, 27.0 per cent; fixed carbon, 61.0 per cent; ash, 10.4 per cent, and sulphur 3.8 per cent.

For various reasons the lower part of the mine had been idle for a long time, and consequently had filled with water.

## BROKE STOPPINGS AND DELAYED THEIR REPAIR

When it was decided to unwater this part of the mine, pumps were installed in the main entry, and at the time of the explosion the water was being lowered rapidly. Large holes had been broken in the brick stoppings between the main entry, which was being used as an intake for the fresh air, and the return aircourse, consequently the ventilation in that part of the mine was very poor.

During the work of unwatering this section of the mine, the mine superintendent, the fireboss and three other men went down the slope to a cross entry near the level of the water to make temporary repairs at the holes in the brick stoppings. The two officials carried flame safety lamps, but the other men wore carbide lamps.

From the evidence obtained during the investigation

of the disaster, it would appear that the two officials walked a short distance up the side entry and set in motion a slight air current, which caused the accumulated gas to work its way slowly to the spot where the men were working on the brick stoppings. As these men had open lights, the gas was ignited and flashed up the side entry, where the superintendent and the fireboss were standing, and burned them fatally.

Analyses of the mine air after the explosion showed 1.35 per cent of methane in this section, which had little if any ventilating current. As the mine was worked on an open-light basis, it must have been considered to be a non-gaseous mine.

A similar explosion in which eight men eventually lost their lives occurred in what is known as the Thick Freeport bed in western Pennsylvania. This bed is now thought to be a peculiar thickening of the Upper Freeport bed, and at this particular mine it was about 9½ ft. thick, including a slate and bony coal band of about 8 in. The roof was a good qual-

ity of shale, and but few roof falls were in evidence. A typical analysis of this coal, excluding the band near the center, would be as follows: Moisture, 2.09 per cent; volatile matter, 37.09 per cent; fixed carbon, 54.12 per cent; ash, 6.70 per cent; sulphur, 2.92 per cent. The average thickness of cover was about 120 ft. The mine was a small one, covering approximately 1½ acres, and had been abandoned ten years earlier.

## ANOTHER CASE IN WHICH GUN WASN'T LOADED

The mine had only one shaft, 50 ft. deep, which was divided by a board partition into two parts, one for hoisting and one for ventilation. Prior to the explosion, natural ventilation was employed, although a fan had been installed. The mine had not been worked on any particular system, rooms and entries being driven in a more or less haphazard fashion. It is understood that the mine had been considered, when previously operated, to be non-gaseous, and open lights had been used.

During the period of idleness there had been an accumulation of water in the mine, which could be removed only at the expenditure of much energy. A centrifugal pump of a capacity of 500 gal. per minute, driven by a 250-volt direct-current motor, had been installed. A few days prior to the explosion, the unwatering of the mine had been completed to such an extent that surveyors could enter and begin a survey of the mine workings.



During the progress of the survey the men experienced trouble in keeping a light in the flame safety lamps which they were using. It so happened that none of the men had been trained in the use of a safety lamp in detecting the presence of explosive gas, and did not realize the reason why their lights were extinguished, and so exchanged them for electric flashlights, with which they finished the survey.

During the work of unwatering, the only lights supposed to have been used by the workmen were ordinary incandescent lamps, a special feed wire being taken down the shaft to supply the light required by the men working around the pump. On the day of the explosion, five men were engaged in moving the pump from a point near the shaft to a place closer to the sump, a distance of 60 ft., and the other three men were placing buntons and guides in the shaft.

While thus engaged, there was a sudden explosion which completely wrecked the hoisting equipment, and blew the three men, who were working 40 ft. below the collar of the shaft, to the surface, and landed them 30 or 40 ft. away from the shaft. Two men in the mine were instantly killed, and three men who were taken out alive, died later from burns and the effect of the afterdamp.

From evidence obtained during the investigation conducted later, it was concluded that one of the men in the mine must have ignited the gas by striking a match. Analysis of air samples obtained in the mine after the explosion showed 0.54 per cent methane.

#### MINE FAN WAS STOPPED AND GAS GATHERED

An explosion in a West Virginia mine which killed one man, and which would have resulted fatally for two others but for a rescue party, was closely associated with the presence of an accumulation of water.

This mine was working the Pittsburgh bed which at this point is 6½ ft. thick. A typical analysis of the coal in this mine is as follows: Moisture, 2.8 per cent; volatile matter, 37.0 per cent; fixed carbon, 51.6 per cent; ash, 8.6 per cent; sulphur, 2.5 per cent. The mine was opened by a slope, and when running produced 150 tons of coal per day.

The mine had been idle for about a week, and owing to floods in that section of the state a much larger volume of water had collected than usual. Three men, including the mine superintendent, entered the mine to make arrangements for pumping out the water that had collected. There was no ventilation as the fan had been shut down. While moving around, a body of gas was brought in contact with an open light and caused the fatal explosion.

One of the most clean-cut cases illustrating the point in question was an explosion which occurred in the opening of a new mine in Clearfield County, Pennsylvania, in which three men were killed.

The coal being mined was 4 ft. thick, and had 35 ft. of slate roof on top of which was a bed of sandstone. The coal bed is supposed to be the Lower Kittanning, although there is some doubt of its identity. The main entrance to the mine was a slope about 500 ft. long, having an average grade of 25 per cent.

Approximately 160 ft. west of the mouth of the slope a shaft 150 ft. deep had been sunk to the coal. From the foot of the shaft two entries had been driven for a distance of about 300 ft., and then stopped on account of water.

Just beyond the foot of the slope two entries had

been turned at right angles and driven parallel to and in the same direction as a line from the mouth of the slope to the center of the shaft. From these two cross entries, two entries were turned and driven to meet those which had been started from the shaft bottom.

About two weeks prior to the accident, one of these latter entries had been undercut into the corresponding entry driven from the shaft. The parallel at the same date had about 15 or 20 ft. to go before it met its corresponding shaft entry. Prior to the cutting through of the first mentioned entries, the water was said to have continued to back up until it stood 60 ft. deep in the shaft.

The ventilation of the entire mine was weak, probably not 3,000 cu.ft. of air going through all the workings. Open carbide lights were used by the men, and no flame safety lamps were at the mine before the explosion. The statement was made that no gas had ever been detected, although this fact has been questioned.

#### COAL UNDERCUT RELEASED GAS INTO ENTRY

On the night of the explosion, three men were working in the entry which had been cut through into the corresponding entry advancing toward it from the shaft, and which for some time previous had been filled with water. At this particular time, however, the water had been drained through the undercut which had been made, until there was a space of about 18 in. between the surface of the water and the roof.

The evidence seemed to show that part of the coal had been shot down, releasing the gas that had collected in that part of the entry which had been full of water. As the men moved around, this gas was ignited by their open lights and caused the death of the three. That the gas was not present when the men first went in was indicated by the fact that the coal had been shot down; if the gas had been present before the coal was shot, it would have been ignited while the men were preparing the shot.

Flooding a mine to extinguish a fire is another phase of this potential hazard. There is one case on record where the workings were flooded, and the water backed up into the shaft for 60 ft. or so. Evidently gas accumulated under considerable pressure, as several times it puffed out of the shaft, blowing the seal off the top. In this case there was no explosion of the gas so released, but if an open light had been near, there would have been at least an ignition.

#### ENTER DRAINED AREA WITH PRECAUTION

It is true that the cases cited are not sufficient to justify the hard and fast statement that there is always an accumulation of gas whenever water backs up under a head into mine workings. However, there is sufficient justification for issuing a warning that extreme care should be exercised when entering an area from which any considerable quantity of water has been drained, and especially so if that water has been standing under a high head.

It would be on the side of safety to use only approved closed lights when working around such an area; or in case open lights are used, no one should be allowed to begin work until a thorough examination has been made by a person experienced in detecting explosive gas by means of a flame safety lamp. The safest procedure is to carry both flame safety lamps and electric cap lamps.

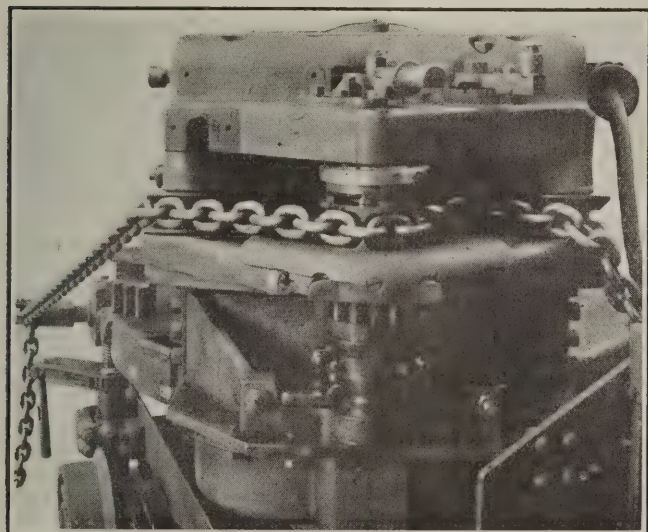


## Adapting Shortwall Machine To Center Cutting

Undercutter Can Be Mounted on Truck So as to Cut a Kerf from  $1\frac{1}{2}$  to  $2\frac{1}{2}$  Ft. or from 3 to 4 Ft. Above Track

**I**N MANY mines the face can be better prepared for shooting by center cutting rather than by under-cutting. This is particularly true in coal beds that carry a parting that may be removed by a center cut. Heretofore, most cutting of this kind has been possible only by the use of a specially designed and comparatively heavy machine. Recently the Sullivan Machinery Co. of Chicago, has developed a truck for an ordinary shortwall undercutter which enables this machine to perform practically the same work as a center cutter.

This machine consists of a standard Ironclad room-and-pillar machine, driven by either direct or alternating current, mounted on a special truck so arranged as to permit the cutting out of a parting without the machines leaving the truck. With this cutter, workings



Rear View Showing Swinging Device

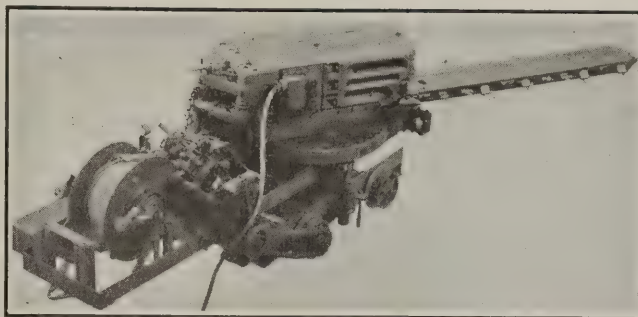
The cutterbar is revolved through its working arc by means of an idler pulley engaging the feed chain, a clutch and a pinion that meshes with a rack or quadrant. The machine is sumped and the truck propelled in the usual manner.

22 ft. wide may be driven successfully, while the circular kerf may be carried to a depth of 8 ft., the ribs or side walls meanwhile being carried straight.

A somewhat similar machine, but one without adjustment for height, has been used successfully for a number of years in West Virginia. It has been employed chiefly in driving entries and in narrow work in general, or in other words, in places where the track may be carried up to the working face.

The lowest setting of the swivel plate gives a minimum height for the bottom of the kerf of 19 in. By extending a set of jackscrews the height of the bottom of the cut may be increased from this figure up to 31 in. On the other hand, the machine may be so built at the factory as to place the maximum height of the kerf at 48 in. above the rails and permit a downward adjustment to a minimum height of 36 in., both measurements being taken to the bottom edge of the incision.

The machine is rotated on its turntable by passing the feed chain around an idler sheave on the rear of



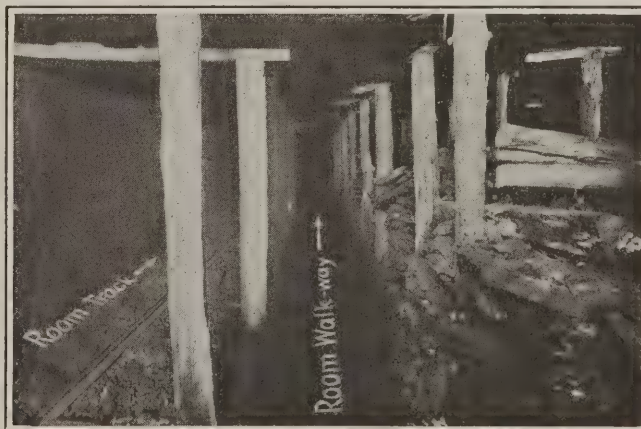
General View of Machine

The cutter itself is a standard machine, but the truck necessarily is of special design. The two details of greatest importance in this truck are the swiveling device whereby the cutterbar is made to describe an arc and the jackscrews by means of which a variation in the height of kerf may be effected.

the housing. A suitable clutch mounted above this idler permits the motion imparted to it to operate a set of gears meshing with a rack on the truck body, thus swinging the cutterbar through a circular arc. The necessary advance for sumping is accomplished by anchoring the feed chain at the face, and thus moving the truck along the track up to its work.

Machine propulsion and the arrangement of the cable reel coincide with the propulsion and reel of the Tip-turn truck used with the standard machine. A friction drive and brake are supplied by means of which a maximum speed of four miles per hour along the rails may be attained. On the other hand, this speed may be reduced to a few inches per minute, thus permitting the machine to enter rooms, round curves or cross switches without danger of derailment. The brake is sufficiently powerful to hold the machine on any ordinary grade. A reel of the self-winding type, capable of picking up the cable when the machine is at rest, as well as when in motion, is supplied. This reel is fitted with the usual roller guides to spool the cable evenly.

This outfit, as may be noted from the accompanying illustrations, forms an extremely serviceable unit for the removal of bands or partings occurring in a coal bed. The truck itself weighs about 4,500 lb., and the machine, with  $7\frac{1}{2}$  ft. cutterbar, weighs approximately 5,000 lb. Thus the combination of the two, or the complete center-band cutter, weighs less than five tons when ready for operation.



A Safety Provision Adopted in Alabama Mines

A safety walkway is provided in all underground passages that are carried forward full width. This walkway lies between the room track on one side and the packwall or gob on the other. It furnishes a straight, free passage for the workmen in traveling up or down the room.





## News Of the Industry



### South Penn Collieries Co. Emerges from Sproul Hard-Coal Merger

Scranton, Pa., Nov. 18—The much discussed merger of independent anthracite companies in process of negotiation by a group of men led by former Governor William C. Sproul was consummated during the past week, when the Legitts Creek Anthracite Co. and the Von Storch Collieries Co. with several other properties, in all six groups, were consolidated. The newly merged company is known as the South Penn Collieries Co.

The new company owns mineral rights underlying 3,320 acres of anthracite lands in Lackawanna, Northumberland and Schuylkill counties and holds leaseholds of additional mineral rights underlying 620 acres. It represents the consolidation of the following properties, owned or controlled through leaseholds by previously existing companies; The Von Storch, Legitts Creek, Shepton, Treverton, Randolph and Silverton.

#### One Property Still Undeveloped

Of the six groups of properties, five are developed with mining operations and collieries and one is to be developed. The oldest property, which was first worked in 1859, has an operating history extending back over a period of more than 65 years. The company also will own or control four washery operations. Recoverable coal underlying the properties in which mineral rights are owned has been estimated at more than 26,000,000 tons; recoverable coal underlying the properties in which leaseholds of mineral rights are held is estimated at 11,000,000 tons. In the properties already developed there are five collieries with two shaft openings; three slope openings and nine drift openings, with present equipment for annual production in excess of 1,600,000 tons.

The Von Storch and Legitts Creek properties are situated in the Wyoming field, in the Scranton district of Lackawanna County. The mines open into one another. The workable coal, in veins 3 ft. or more in thickness, underlying these properties is in twelve and ten veins respectively, the veins varying from 3 ft. to 10 ft. in thickness.

The Shepton property is situated on Green Mountain, in Schuylkill County, in the eastern part of the central field, about 10 miles west of Hazleton. In this property there is in No. 1 Basin one vein 17 ft. to 13 ft. thick; in basin No. 2 one vein 8 ft. thick; No. 3 basin is believed to contain one or more veins not yet proved. It adjoins the Oneida No. 1, 2 and 3 collieries of the Lehigh

Valley Coal Co. and the Girard estate.

The Treverton property, where the Katherine mine and colliery is owned and operated, is in Northumberland County, in the western part of the Schuylkill anthracite field, about 10 miles southwest of Shamokin. The workable coal underlying the Treverton property, of or exceeding 3 ft. thick, is in five veins, varying from 3 to 10½ ft. thick.

The Randolph and Silverton properties, which are to be operated under leaseholds, are in Schuylkill County, in the southern part of the anthracite field, the former just west of Port Carbon and the latter about 4½ miles west of Pottsville. The coals underlying these properties are of good quality, the workable coal underlying the Randolph property being in eight veins from 3 to 10 ft. thick, and that underlying the Silverton property in fifteen veins, of which five from 4½ to 10½ ft. thick have been developed.

Officers of the South Penn Collieries Co. will include William C. Sproul, president; Newton P. Jackson, treasurer; Alexander Staples, secretary; Warren T. Acker, manager of the Lackawanna district; Hubert D. Johnson, manager of the Schuylkill district. Directors of the company include Governor Sproul, B. Dawson Coleman, president of the Ebensburg Coal Co., and director Baldwin Locomotive Works; Alfred A. Corey, Jr., president Vanadium Corporation of America; Francis V. du Pont; John H. Mason, chairman of the Bank of North America, and John P. Crozer, president of the Crozer Land Co. and director of the Crozer-Pocahontas Coal Co.

### Western Kentucky Strike Runs Steadily Onward

The end of the week of Nov. 10 found the strike in western Kentucky going into its seventh official month, although some mines were closed down two weeks or more prior to April 15. Much suffering is reported in the Central City district, where miners are having trouble in getting even medicines for their sick. Many miners admit that they are willing to return to work, but are afraid to do so. Unless an agreement is reached soon it looks as if the field may be down until the autumn of 1925, as the active season will soon be over unless there is an adjustment. A few mines around the edge of the district are working on 1917 wages.

### Soft-Coal Industry Benefits Consumers, Says Coolidge

In an address at a meeting of the U. S. Chamber of Commerce, President Coolidge indicated that he favored further reduction in federal taxes, pointing out that fuel and other articles pay a tax to the government and that the people pay these taxes when they buy such necessities.

The President stressed the fact that the bituminous-coal industry benefits consumers. He said: "When we look for an example of benefiting consumers we shall find it in the bituminous-coal industry. Three years ago there were about 9,000 mines, or 30 per cent more mines and miners than could be given regular employment. The Department of Commerce found there was need of more cars, more summer storage and more industrial peace. These have been accomplished, with the result that while in the profiteering period of 1920 run-of-mine coal averaged \$5.64 a ton, notwithstanding the strike in 1922 it then averaged \$3.67 per ton, and for the year ending June 30 last it averaged \$2.23 per ton. This industry has been organized but not monopolized; it has between 7,000 and 8,000 competing mines, and no person or group controls more than 2 per cent or 3 per cent of the production."

### Lewis and Aides Almost Sure To Be Re-elected

Present officers of the United Mine Workers will have a candidate appearing against each of them on the ballot in the annual election of Dec. 9, but the strength of the opposition is regarded as slight, and the present incumbents probably will be elected by substantial majorities. The ballot for the election showing the names of the candidates was made public recently. John L. Lewis, international president, is opposed by George Voyzey, of Verona, Ill.; Philip Murray, international vice-president, is opposed by Arley Staples, of Christopher, Ill., and William Green, secretary-treasurer, is opposed by Joseph Nearing, of Nova Scotia.

All of the members of the auditing and credential committee, the board of tellers, and the delegates to the American Federation of Labor are up for re-election and also have opposition.



## Joint Safety Conference Studies Rock Dusting

A joint safety conference held in the auditorium of the Chamber of Commerce, Pittsburgh, Pa., Nov. 10, was participated in by the American Society of Safety Engineers, the engineering and mining sections of the National Safety Council, the Pennsylvania Department of Labor and Industry, the Coal Mining Institute of America, the U. S. Bureau of Mines, the Pennsylvania State Department of Mines and the Western Pennsylvania Safety Council.

Richard H. Landsburgh secretary of the Pennsylvania Department of Labor and Industry, presented at the morning session a program of co-operative effort in safety work of industries in Pennsylvania with the Department of Labor and Industry. J. T. Ryan, of the Mine Safety Appliances Co., presided at a symposium on "Rock Dusting for the Prevention of Mine Explosions." Edward Steidle, Carnegie Institute of Technology, spoke on "The Need of Rock Dusting," and T. G. Fear, Inland Collieries Co., on "Rock Dusting the Indiana Mine."

At the afternoon session J. A. Oartel, Carnegie Steel Co., Pittsburgh, was general chairman. He introduced the Rev. C. H. Rust, Wilkesburg, Pa., whose subject was "Men and Machines." His talk was followed by a symposium on "Practical Safety Kinks," with exhibits and slides, contributors to which were C. B. Auel, Westinghouse Electric & Mfg. Co.; J. A. Northwood, Bethlehem Steel Co., Johnstown, Pa.; A. R. Pollock, Ford Collieries Co.; J. T. Ryan, Mine Safety Appliances Co.; A. C. Gibson, Spang Chalfant & Co.; H. F. Webb, West Penn system, and C. F. Abel U. S. Aluminum Co.

A symposium on "Shop Safety Education Stunts," with exhibits and slides, had as participants A. C. Cook, Carnegie Steel Co., Youngstown, whose subject was "Running a Safety Drive," and E. S. Wright, Edgar Thomson Works Carnegie Steel Co., Braddock, Pa., who spoke on "Four Years Without a Lost-Time Accident."

## Merger Plan Breaks Down Once More

For months a "big deal" has been talked of in western Kentucky. It was to result in a combine of seven big mines of about six companies. But somehow financial arrangements were not made. Now it has been postponed again, an option having expired on Nov. 10. L. H. McHenry, Louisville bond broker, is said to represent the buyers. Properties of the W. G. Duncan Coal Co., Pacific Coal Co., Wickliffe Coal Co., Greenville Coal Co. and Nelson Creek Coal Co. were among those included in the proposed deal. All of these mines are strike bound at the present time. Banks are slow to finance striking properties and, strangely, the present owners want a real return from anyone who talks of buying. Hence nothing happens.

## Low Prices Realized in Disposal of Holdings of Jewett-Bigelow-Brooks

The tangled affairs of the defunct Jewett, Bigelow & Brooks Coal Co. finally have been straightened to the extent of disposing of nearly all of the eastern Kentucky coal properties once operated by the company. Creditors suffered heavily because the various public sales of mines practically fell flat. It is freely said that the returns will hardly more than pay the salaries and expenses of the receivers, E. L. Douglass and John L. Richey, of Cincinnati, Ohio.

The best mine in the group, the First Creek Mining Co. property in the Hazard field, sold to R. S. Young, of Knoxville, said to be acting for the Blue Diamond Coal Co., of Cincinnati, for \$100,000, as reported last week in these columns. This mine will be operated as the Sapphire Coal Co. The Hazard Jellico Coal Co. was returned to the Harvey Coal Co., of Knoxville, Tenn., the lessor. The third Hazard property, the Black Joe Coal Co., sold at auction for \$26,500 to W. E. Davis, of the Midland Mining Co.

In the Elkhorn district the J. B. Elkhorn Coal Co. mine sold for \$40,000 to Captain R. R. Smith, of Huntington, W. Va. These openings are on Shelby Creek. The Harlan Fox Coal Co., which was the only Harlan property of Jewett, Bigelow & Brooks, brought \$25,110 from C. Paul Downard and Elmore H. Manning, Louisville (Ky.) jobbers, who are forming a new company to operate under the old name of the mine.

In Bell County, the J. B. Straight Creek Mining Co., on which an original bid of \$7,000 had been made, finally was sold for \$15,000 to R. L. Moss, of Pineville, Ky. Two mines of the Roth Coal Co. on the Cumberland Ry. near Artemus, Ky., were in the J.B.B. string. No. 1 was returned to the lessor, Ray Moss, of Pineville, Ky. No. 2 mine, which is involved in further litigation and whose railroad connection is broken by the collapse of a big trestle, was sold for \$5.

Three properties remain in the hands of the receivers. They are the Jaybee Jellico Coal Co., with a mine that has been operating in the Dean seam at the edge of Pineville, and two West Virginia mines—those of the Seminole Gas Coal Co., close to Clarksburg, and of the Guyan Mining Co., at Logan.

All of the sales were approved by the federal court in Covington, Ky.

Explosives manufactured in 1923 exceeded by 26.8 per cent the output of 1921, figures just made public by the Bureau of the Census show. The number of men employed in the industry increased 42.7 per cent. The amount paid for wages was 37.8 per cent greater and the cost of raw materials was 28.9 per cent greater. One of the striking features of the Census return was the increase of 82.9 per cent in the output of permissible explosives. In 1923 the total output was 67,334,759 lb. There was a large increase in the output of dynamite, which in 1923 amounted to 262,290,012 lb., an increase of 56.8 per cent over 1921.

## Ford Scheme Has Dock Men on Ragged Edge

Ford is playing havoc around the Head-of-the-Lakes. This is not so much from what he is doing at present, as he has little coal to sell, but because the dock men are unable to tell where the lightning will strike next year. The trade has been circularized and is urged to buy coal (Kentucky) at 20c. above dock price in carload lots. This cuts out the dealer, or would in other lines of coal. The Ford agents are handling the coal but are not enthusiastic, as they have to guarantee payments and make collections, all for 25c. a ton. The advertising states that other coals carry 13 to 31 per cent ash and that Ford Kentucky is far superior to this. This point, of course, is debatable, as the other dock men claim a much lower percentage of ash than stated by Ford.

## Name Committee to Effect Uniform Tax Rulings

In accordance with a resolution adopted at the Sacramento convention the following members of the general tax committee of the American Mining Congress have been assigned by the tax division as a sub-committee to effect uniformity and justice in income taxes on coal operators: R. V. Norris, Wilkes-Barre, Pa.; Howard N. Eavenson, Pittsburgh; George Wolfe, Beckley, W. Va.; T. T. Brewster St. Louis, newly appointed on the committee; J. G. Puterbaugh, McAlester, Okla., and Paul Armitage, New York.

The tax division has asked the Internal Revenue Commissioner to reverse the decision of the revenue solicitor which gave an adverse interpretation to Art. 222 relating to items which should be charged to expenses. Mr. Brewster, chairman of this sub-committee, and McKinley W. Krieger, chief of the A.M.C. tax division, conferred with J. G. Bright, Deputy Commissioner of Internal Revenue, on administrative matters pertaining to the audit of income tax returns of coal companies. Mr. Bright outlined several recent changes in office procedure to obtain maximum efficiency, and stated that the entire field force of the income tax unit has been instructed to co-operate with taxpayers in every possible way to effect prompt and proper adjustments of tax liability. It was agreed that the American Mining Congress sub-committee should devote special attention to proposals that will clarify the regulations and simplify the work of the unit, as well as the taxpayers.

The sub-committee it was announced, will proceed at once with the consideration of certain problems outlined by John Laing, Charleston, W. Va., author of the resolution creating this committee, including the recent adverse interpretation by the Solicitor of Internal Revenue of Art. 222, Regs. 45 and 62, which ruling the American Mining Congress has sought to have revoked.



## Central Pennsylvania's Long Slump Breaks as Mines Show Signs of Life

That the coal industry is picking up in northern Cambria, Clearfield and Centre Counties is revealed by a recent survey of conditions in central Pennsylvania. Osceola Mills, in the Clearfield region, shows unmistakable signs of activity. Penn mine No. 5 is working, Dushannon mine is doing four days a week and No. 10 is working four days a week and other operations are doing equally as well. This town has the Pennsylvania R.R. yards on the mountain and with the shipping of coal the yards are active and business is looking up along all lines. A further increase in production is confidently expected with the advent of cold weather.

Houtzdale, another important coal-mining town in the Clearfield region, shows signs of revival. During the World War and for a few years thereafter, mines were opened in the back yards of homes and coal was conveyed from them in wheelbarrows, wagons and trucks to railroad sidings and loaded on cars. This prosperity could not last and soon Houtzdale found itself with a lot of mines and a lot of miners on hand and no market.

### Plan for Permanency

Houtzdale survived the dark days, however, and hope has revived. The most promising sign is that the operators are planning for permanency rather than for booms. More than a year ago the Hale Coal Co. awarded a contract for sinking a shaft to tap the lower vein of high-grade coal at Morann, near Houtzdale. That operation has been completed. The shaft is of concrete, 180 ft. deep, and is electrically operated. It has four compartments, two of them for hoisting coal exclusively, the cages being self-dumping. Designed for a capacity of 250 tons per hour, the mine is equipped to ship run-of-mine, lump or slack sizes. William Wetter, of the Madeira-Hill Coal Mining Co. is general manager of the Hale company and other Madeira-Hill officials are connected with the new company.

At Mountindale, in the northern part of Cambria County, where the principal industries are coal mining and brick making, one largely dependent on the other, the Harbison-Walker Co. is now working, giving employment to 275 men in the coal mine, in the clay pits and on brick work.

Dependent upon the coal industry, Philipsburg, one of the oldest coal towns in central Pennsylvania, has felt keenly the severe slump in that industry. Not only did the operator and the miner suffer, but all other business. A profound spirit of pessimism prevailed. As a result, many men left the region for other locations and to seek other employment where industry was more stable.

A new spirit has appeared of late, however, with the resumption of operation at the mines. At Winburne, the Pennsylvania Coal & Coke Co. and Peale, Peacock & Kerr are working four days a week.

At Morrisdale, the Cunard Coal Co.



John Laing

President of the Wyatt Coal Co., Charleston, W. Va., who was elected president of the Kanawha Operators' Association at the annual meeting, held recently in Charleston. The other officers chosen were: D. H. Morton, vice-president; John L. Dickinson, treasurer, and D. C. Kennedy, secretary. The new board of directors consists of Col. W. M. Wiley, Col. E. O. Dana, H. L. Warner, F. A. Harris, W. C. Mitchell, F. H. Morton and C. A. Cabell.

and the Morrisdale Coal Co. are operating on half time with better prospects for the future. The Harbison-Walker Refractories Co. is operating its plants at Philipsburg, Blue Ball and Wallace. Brick plants at Sandy Ridge and at Retort also are running, with the prospects improving weekly. These plants all consume considerable coal and when the one is in operation the other must go. Improvement in all other towns of the region is noticeable and depression has given a place to optimism. With the election over, winter coming on and other industry starting up, prospects for the coal industry of the region are better.

## Pittsburgh Terminal Absorbs Meadowlands Company

The Pittsburgh Terminal Coal Co. and the Meadowlands Coal Co. are to be merged into a new corporation known as the Pittsburgh Terminal Coal Corporation, according to an announcement made early last week. The new company will have a capitalization of \$4,000,000 of 6 per cent cumulative preferred stock and \$12,000,000 of common stock.

The present owners of the Pittsburgh Terminal Coal stock will receive all the preferred and \$8,000,000 of common stock of the new company. Holders of the Meadowlands Coal stock will receive \$4,000,000 of the new common stock. The new company will have 20,000 acres of coal land with an annual output of approximately 15,000,000 tons of coal.

The Pittsburgh Terminal Coal Co. is a subsidiary of the Pittsburgh & West Virginia Ry. but under a plan now before the stockholders the coal property is to be segregated from the railway property.

## Production of Coal in Canada During August Was Lowest of the Year

Coal production by Canadian mines during August, according to a report by the Dominion Bureau of Statistics, was the lowest of the year. The decrease in quantity from the previous month was 7 per cent, falling from 730,316 tons in July to 682,878 tons in August. Compared with average output during the past five years the decrease was 45 per cent. These decreases may be explained by the strike in Alberta and British Columbia (District 18). The monthly average production of Alberta and British Columbia for the five preceding years was 686,485 tons as against 254,519 tons during August of this year. In Nova Scotia production fell from a monthly average of 504,014 tons to 403,739 tons, a decrease of 20 per cent.

Imports of coal from the United States and Great Britain decreased about 6 per cent. August imports amounted to 1,557,141 tons while in July 1,655,712 tons was brought in. The August importations this year were 21 per cent lower than the five-year average for the month. During the month 50,641 tons was imported from Great Britain. Total importation of all coal for the eight months of 1924 was 10,577,823 tons, or only 6 per cent below the preceding 5 year average for the period.

Imports of anthracite for August totaled 329,377 tons, which is 20.7 per cent less than in July but 22 per cent less than the five-year average for the month. Anthracite imported from the United States amounted to 286,964 tons, while 42,413 tons came from Great Britain. The anthracite imports during the 8 months of 1924 were 2,641,275 tons, a decrease of 9 per cent from the five-year average for this period.

Exports of Canadian coal during August were 10 per cent lower than in July. The quantities were: August, 63,415 tons, and July, 70,235 tons. Comparison of August exports with the preceding five-year average shows a decrease of about 71 per cent.

Figures on output, imports and exports, as outlined above, show that the quantity of coal made available for consumption decreased about 7 per cent from the previous month, the August total being 2,176,704 tons as against 2,315,793 tons during July. In comparison with the five-year average for the month, the August available tonnage was lower by 27 per cent. The total coal available for use in the first eight months of 1924 amounted to 18,322,277 tons.

The total number of men employed in the coal mines of Canada during August was 19,280, of whom 14,682 worked underground and 4,598 on the surface, as compared with a total of 17,522 in July, of whom 13,392 worked underground and 4,130 on the surface. The monthly production per man was 35.4 tons for August as against 38.1 tons per man for July. During August the production per man-day was 1.9 tons as compared with 2 tons in July. The tonnage lost was largely due to lack of orders in August.



# Jacksonville Agreement Proves Setback To Union Fields

Fall in Prices Restricts Profits to Lowest Cost Producers—Hundreds of Mines Forced to Close—Autumn Revival Benefits Mostly Non-Union Operations

BY PAUL WOOTON  
Washington Correspondent of *Coal Age*

After seven months of its operation it is possible to draw certain concrete conclusions as to the effect of the Jacksonville agreement. While it is yet too early in the life of that compact between the United Mine Workers and the operators of union mines to judge the ultimate effect on the patient of the "self-imposed surgical operation" advised by Dr. Hoover, something can be said as to the present state of health of that patient. All admit that prices have fallen to levels which restrict profits to the lowest cost producers. Hundreds, if not thousands, of mines have been forced to close. Most of the operators who have closed down their properties hope to reopen them, but sooner or later they must realize that that day never may come.

## Many Large Mines Idle

Of the mines reporting to the U. S. Geological Survey, which are the larger commercial operations and not wagon mines, some 35 per cent are closed entirely. The remainder, with few exceptions, are working only part time. The story is told by the accompanying table. These figures are abstracted from the weekly reports of the Geological Survey. The table compares conditions in the union fields with those in the non-union fields. It uses as a standard of comparison the percentage of full time at which the mines in each district are operating. The first column shows this percentage for the week of July 26, four months after the Jacksonville agreement went into effect. The second column shows the percentage for the week of Oct. 25, practically concluding seven months' experience under the compact. The table follows:

Percentage of Full Time Worked at  
Union and Non-Union Mines

District	UNION	
	July 26, 1924	Oct. 5, 1924
Illinois.....	28.6	45.9
Indiana.....	24.2	38.5
Southern Ohio.....	12.7	
Eastern Ohio.....	64.0	62.5
Pittsburgh (rail).....	35.3	51.6
Central Pennsylvania.....	39.2	55.6
Fairmont.....	32.0	43.6
Western Kentucky.....	23.1	37.4
NON-UNION		
Westmoreland.....	44.2	63.2
Winding Gulf.....	47.6	65.1
New River.....	44.8	64.1
Pocahontas.....	53.8	76.9
Tug River.....	56.3	82.6
Kanawha (C. & O.).....	43.7	56.8
Logan.....	70.1	75.7
Kenova Thacker.....	46.0	62.6
Northeastern Kentucky.....	58.2	61.3
Hazard.....	50.9	66.8
Harlan.....	48.1	67.5
Virginia.....	66.9	75.0

It will be noted that the comparison is against the union fields in almost every case. Taking the condition after

four months of the agreement it will be noted that out of the eight union districts there is only one that reached 40 per cent of full-time operation. The single exception is eastern Ohio, which has specially favorable lake connections. On the other hand, of the non-union districts there is not one that did not operate at more than 40 per cent of full time. Even the Kanawha operators on the Chesapeake & Ohio R.R. made a showing of 43.7 per cent. Though running open shop they are less free to reduce wages and labor costs than are the operators in the non-union strongholds. Thus it was that the competing Logan district, just over the mountain, which ships the same kind of coal to the same markets, was able to show a figure of 70.1 per cent.

Of course the first column represents conditions when the depression was at its depth. In July the weekly output was barely seven and one-half million tons—no greater than during the great depression of 1921. It was a time when the market was deadened by heavy stocks and by the state of the principal coal consuming industries.

## Non-Union Output Higher

The figures in the second column, however, are for a period when the output is running above ten million tons—not far from the normal at that season of the year. During the week of Oct. 25 the output was 10,300,000 tons, or 2,800,000 tons greater than the output for the week of July 26. The question is, Who has supplied this additional demand? The figures show that the bulk of it has been supplied by the non-union fields.

The condition after seven months of the Jacksonville agreement is indicated by the fact that of the eight union districts only one was working at 60 per cent of full-time operation. The exception is the same as cited before, eastern Ohio with its geographical advantage with respect to the lake trade. On the other hand, each of the twelve non-union fields, with the exception of Kanawha, was working in excess of 60 per cent of full time. Thus it is apparent that the diversion of business from the union to the non-union fields continued during the more active demand of the autumn, even when the need for coal is increased as the country moves from depression into abundant prosperity.

It is true that operations in the union districts are making a better showing than they were at the trough of the slump last summer. Every one of the union districts except the Ohio fields shows a higher percentage in the last column than it does in the first, but the increases for the most part have been small as compared with those in the non-union fields, some of which—Poca-

## This Mule Had Designs On the "Movies"

"The anecdotes of bright mules which have been appearing in *Coal Age*," says an engineer, "recall an interesting experience I had in 1917 when my company was receiving a considerable portion of the output of a stripping mine in northern West Virginia. I found that snapshots would tell conditions and progress of operation better than a lengthy report; therefore I carried a camera wherever I went. 'Joe' was a mule whose duty it was to spot mine cars. He was said to be about 40 years old but was pretty sleek and looked good for many more years. I took his picture once or twice. After that whenever I had the camera with me he would straighten up, prick up his ears and look at me as if to say 'Don't I look pretty'? If I did not have the camera he would remain in his usual semi-comatose state with eyes half closed, ears drooping and legs appearing about ready to collapse. I believe 'Joe' could tell at 100 yards whether I had the camera or not."

Any more?

hontas, Tug River and Logan—are reporting running time in excess of 75 per cent, which is ahead of all but the best performance during the war.

The foregoing comparison is confined to the fields of the Appalachian and middle Western regions. The remainder of the country is excluded because it is in the regions mentioned that the drama of coal is played. The area of the Central Competitive field and that of its non-union antagonists are those from which the Northwest draws both its lake and rail supplies. These are the areas that furnish the coal for the Canadian and the tidewater trade and for the fueling of the industries of the North and East. What happens outside these areas has little bearing on the making of wage agreements. The fate of the Jacksonville treaty will be settled by the results in the fields listed in the table.

## Average Figures Deceptive

One thing is not revealed by figures of the average time worked. An average may be a deceptive thing, yet none disputes its usefulness. It never shows the extremes which go to make up the average. The averages shown in the table are made up of very unlike items. Into them go mines which are working full time and mines which are shut down entirely. The figures do not show that along with the shifting of business from union to non-union fields is a shift from the little mine to the big mine; a shift from the weak to the strong; a shift from the thin-vein to the low-cost thick-vein mines. These all represent complications which have followed the major operation at Jacksonville; their ultimate effect on the health of the patient still is to be determined.



## Safety Education Planned In Kentucky

J. Wood Vance of Glasgow, Ky., State Representative from Barren County in the 1916, 1917, 1918, 1920 and 1924 General Assemblies, was selected Nov. 10 as referee of the Workmen's Compensation Board to serve in western Kentucky. His position was created due to a 400 to 500 per cent increase in the work of the board, officials said. A special meeting of the board, W. H. Jones, chief of the Department of Mines; representatives of coal operators, employees and compensation insurance carriers of Kentucky resulted in a tentative organization to promote greater safety. Those attending were R. C. Thomas, T. H. Ruddy, E. R. Glayton, R. E. Hume, J. E. Johnson, E. D. Johnson, R. E. Grace, C. J. Neekamp, representing the operators; Calvin Mays, the employees; D. A. Macwhirter, the insurance carriers; Alvis S. Bennett, R. T. Kennard, Joseph E. Lee, A. T. Bryson and Forest J. Fields, the board, and Mr. Jones. Following decision to form a permanent organization, a committee was appointed to draft a definite plan of procedure to carry out the proposed "education program for accident prevention and safety-first practices." The meeting adjourned to meet on Dec. 3 at Lexington.



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### H. Foster Bain

Director of the U. S. Bureau of Mines, who will sail from the United States for Argentina on Nov. 22. Accompanied by three mining experts he will make an extended study of the possibility of developing the iron and steel industry in the South American republic. He goes at the request of the Argentine Government.

coal industry, will be vice-president and general manager.

Engineers familiar with the development and present stage of the Trent process activities believe that it has a promising future in the field of fuels, especially with regard to domestic heating, gas manufacture, gas producers, pulverized combustion, locomotives, steam plants, power and heating.

The distillation of byproducts should give an additional value. Plants are now in operation at Toledo, Ohio; Spokane, Wash.; Lapugny, France, and under construction at Moundsville, W. Va., and near Clearfield, Pa. Contracts have been signed for the erection of other plants.

## 14,000 Strike at Collieries Of Hudson Coal Co.

*Special to Coal Age*

Scranton, Pa., Nov. 17.—Disregarding orders from both John L. Lewis, international president, and district officials of the United Mine Workers, the general grievance committee of the Hudson Coal Co. on Saturday called a general strike of the company's employees effective today. As a result, eleven of the company's collieries, employing 14,000 men, are idle. Eleven other operations, the employees of which are affected by the strike order, are operating, as the men voted to work despite the committee's order.

President Lewis today telegraphed from Texas, where he is attending a convention, and demanded that Rinaldo Cappellini, district president, and David Davis, international organizer here, exert every influence to settle the strike. Long pending grievances are blamed by the general grievance committee for the walkout. Officials of the Hudson Coal Co., in full page newspaper advertisements yesterday, appealed to the men to continue work, pointing out that the walkout was illegal in that it violated the contract between the union and the operators.

Surface indications demonstrate that the local union officials are unable to check the general grievance committees in their methods of handling grievances. The Hudson company strike has been threatened time and again during the past few months and only interference by the local officials prevented it. However, the alleged insurgent element in the organization dominated, and on Saturday the strike was called. Efforts are now under way by district officials to bring about special meetings of colliery local unions to rescind the strike action at each idle colliery. This method brought results in the recent Glen Alden general strike.

## Trent Company Reorganized

The present Trent Superfuel Co. is to be reorganized under new management, as the Superfuel Corporation of New York. It will at once begin the enlargement of the Newark plant to a capacity of 1,000 tons per day. Guy Standifer prominently identified with Pacific Coast shipbuilding interests, will be the new president, and Francis R. Wadleigh, former Federal Fuel Distributor and a prominent factor in the

## Number and Output in Net Tons of Soft-Coal Mines in United States in 1923, by Classes (a)

(Including Wagon Mines)

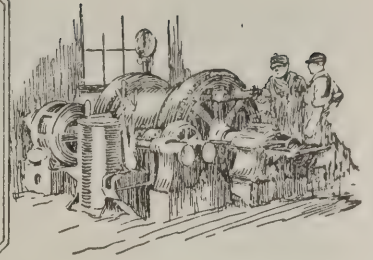
State	Class 1, producing over 200,000 tons			Class 2, producing 100,000-200,000 tons			Class 3, producing 50,000-100,000 tons			Class 4, producing 10,000-50,000 tons			Class 5, producing less than 10,000 tons			Total all classes	
	Number	Per cent of total mines	Per cent of output	Number	Per cent of total mines	Per cent of output	Number	Per cent of total mines	Per cent of output	Number	Per cent of total mines	Per cent of output	Number	Per cent of total mines	Per cent of output	Number of mines	State output
Alabama.....	24	7.6	42.5	38	12.1	25.2	49	15.5	16.0	108	34.3	14.8	96	30.5	1.5	315	20,458,000
Alaska, Calif., Idaho, and Oregon.....	...	...	...	1	0.7	9.6	4	2.7	21.4	4	23.5	85.0	13	76.5	15.0	17	140,000
Arkansas.....	...	...	...	19	7.5	25.6	31	12.3	21.1	29	19.9	48.2	112	76.7	20.8	146	1,297,000
Colorado.....	15	5.9	37.6	...	...	...	...	...	...	49	19.4	12.4	139	54.9	3.3	253	10,346,000
Georgia.....	...	...	...	...	...	...	...	...	...	1	33.3	95.6	2	66.7	4.4	3	76,000
Illinois.....	134	21.4	74.8	82	13.1	15.2	64	10.2	6.1	98	15.7	3.0	247	39.6	0.9	625	79,310,000
Indiana.....	48	11.9	59.2	34	8.4	18.4	45	11.2	13.1	72	17.8	7.3	205	50.7	2.0	404	26,229,000
Iowa.....	4	2.4	22.2	11	6.7	27.3	19	7.7	24.6	51	30.9	22.7	80	48.5	4.2	165	5,711,000
Kansas.....	...	...	...	8	2.7	28.5	23	7.7	43.1	35	11.8	19.4	231	77.8	9.0	297	4,036,000
Kentucky.....	36	2.9	25.8	110	8.7	31.8	132	10.5	21.6	267	21.3	16.1	711	56.6	2.7	1,236	44,777,000
Maryland.....	...	...	...	3	2.0	16.5	12	8.2	37.1	32	21.9	35.9	99	67.9	10.5	156	2,286,000
Michigan.....	2	14.3	40.8	3	21.4	30.3	2	14.3	14.3	5	35.7	14.2	2	14.3	0.4	14	1,172,000
Missouri.....	1	0.4	9.1	4	1.7	14.5	18	7.9	35.9	42	18.3	28.9	164	71.7	11.6	229	3,403,000
Montana.....	4	6.5	64.0	3	4.8	13.0	5	8.1	12.1	9	14.5	7.7	41	66.1	3.2	62	3,148,000
New Mexico.....	2	3.1	20.8	14	21.5	58.3	3	4.6	7.7	12	18.5	11.6	34	52.3	1.6	65	2,915,000
North Carolina.....	...	...	...	...	...	...	...	...	...	2	100.0	100.0	...	...	...	2	36,000
North Dakota.....	1	0.7	16.3	1	0.6	8.2	3	2.1	15.1	25	17.4	41.4	114	79.2	19.0	144	1,386,000
Ohio.....	58	4.7	40.6	84	6.8	29.1	76	6.2	13.4	223	18.1	12.8	792	64.2	4.1	1,233	40,546,000
Oklahoma.....	1	0.6	8.4	3	1.8	17.1	9	5.4	23.5	55	33.8	45.0	95	58.4	8.0	163	2,885,000
Pennsylvania.....	247	6.8	53.9	234	6.4	19.2	286	7.9	12.0	872	24.0	12.1	1,997	54.9	2.8	3,637	171,880,000
South Dakota.....	...	...	...	...	...	...	...	...	...	...	...	...	15	100.0	100.0	15	10,000
Tennessee.....	3	1.3	13.1	11	4.7	24.1	24	10.4	28.5	68	29.3	28.3	126	54.3	6.0	232	6,040,000
Texas.....	...	...	...	...	...	...	9	20.5	39.2	27	61.4	56.7	8	18.1	4.1	44	1,187,000
Utah.....	10	26.3	60.7	8	21.1	27.2	6	15.8	10.4	2	5.2	1.0	12	31.6	0.7	38	4,720,000
Virginia.....	19	9.7	59.7	12	6.2	15.5	20	10.2	12.1	50	25.6	10.8	94	48.3	1.9	195	11,762,000
Washington.....	4	7.0	36.6	8	14.0	41.3	4	7.1	8.8	13	22.8	10.7	28	49.1	2.6	57	2,926,000
West Virginia.....	122	6.8	34.5	223	12.4	28.4	318	17.7	21.0	589	32.8	14.4	546	30.3	1.7	1,798	107,900,000
Wyoming.....	13	19.4	46.9	21	31.3	40.7	12	17.9	10.5	3	4.5	1.4	18	26.9	0.5	67	7,575,000
Grand total.....	748	6.4	47.1	935	8.1	23.2	1,175	10.1	14.9	2,743	23.6	12.2	6,021	51.8	2.6	11,622	564,157,000

(a) Note that this table represents mines, not companies, for which the showing would be much different.





## Practical Pointers For Electrical And Mechanical Men



### Locomotive Lamps Burn Out Because Circuit Supplies Two Voltages

Normally the Headlight Lamp Receives Only 9 Volts  
But When the Main Fuse Blows 87  
Volts Get to the Lamp

WHEN an electrical engineer works for a big mining company it is always difficult for him to make frequent trips to all of the mines he has in his charge. Another difficulty he has is to attend to all the troubles which are found when with much effort the infrequent visits are made.

Some men believe that most of the little troubles experienced by workmen are half imaginary and therefore should be forgotten, but here is a little story which shows how easily important details may be allowed to slide.

At one of our mines the locomotive men operating storage-battery locomotives complained that the headlight lamps were not satisfactory. Every once in a while, they claimed, the lights

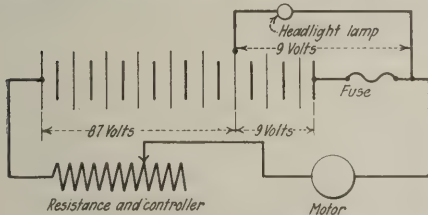


Fig. 1—This Circuit Subjects Lamps To Excess Voltage

Thus arranged the fuse does not protect the lamp. When the fuse blows and the controller is on, the headlight receives an 87-volt pressure. The circuit through the controller and motor causes the lamp to burn out.

would burn out, and they would find themselves in darkness. Of course, this provoked them, especially when they were far inside the mines where new lamps were not available.

When I realized what severe service most locomotives experienced I was not surprised when the motormen told me that their lamps frequently burned out. These were the first locomotives to be used at this mine, and I therefore thought that the motormen were expecting too much from their headlight lamps. I assumed that they expected them to last as long as lights used in the shops and that the only trouble they had was that the lamps failed to meet their unreasonable expectations. Besides, when I first heard this story I was on another mission to the mine and therefore did not have much time to look into the trouble.

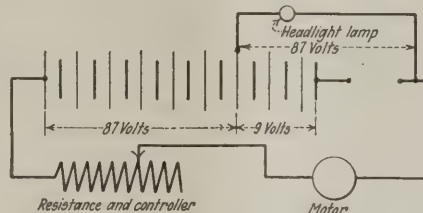


Fig. 2—How High Voltage Gets To Headlight Lamps

The supposedly perfect circuit in Fig. 1 now shows itself to be false. When the fuse is out the long end of the battery supplies voltage to the lamps and they pop.

However, I noted the complaint and took the first opportunity to visit that mine again. Much to my surprise the difficulty with the lamps had persisted, and the motormen had kept the old lamps so as to impress me by their number. I suppose I did not show enough concern on my previous visit, and they proposed to prove to me this time that they had not been making statements without justification. Sure enough they had plenty of old burned out lamps to show me and the requisitions for new ones were steadily increasing.

Apparently, something was wrong so a thorough investigation was started. One of the locomotives was nearby and the wires were traced from the battery to the headlights, the voltage was measured and proved to be correct and the lamps were lighted to their normal brilliancy. Where was the trouble? Everything looked all right. The lamps were receiving the voltage for which they were designed as testified by the

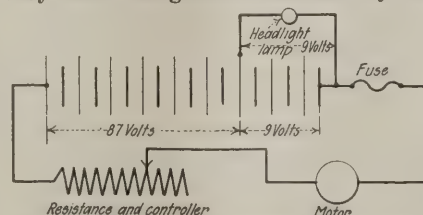


Fig. 3—Simple Change Corrects Lamp Circuit

By merely changing the connection of one wire from the load side of the fuse to the battery side the lamp is safe against high voltage coming from the other end of the battery whenever the main fuse blows.

voltage figure stamped on them. To prove that they would work satisfactorily at this voltage the electrician had previously connected one of the lamps to four spare cells, and it had been burning continually for over a month.

We were about to come to the conclusion that we had received a poor lot of lamps and that the only solution was to await the supply furnished on the next order in the hope that they would be all right. There wasn't much satisfaction in this idea because many consignments of lamps had been received and the results with all of them were the same.

Suddenly one of the motormen said something which was new. We had hounded every clue until I was sure we had not hit the right one and therefore anxiously picked up this last remark of the motorman. He said that his lamps burned out whenever he had an overload on his locomotive. Now how could this affect the lamps? We will see.

Fig. 1 shows the manner in which the battery, motor, resistance, controller and lamps originally were connected. Note that the lamp is connected near one end of the battery and the other terminal is connected to the load side of the main fuse. Now look at Fig. 2 and see what happens when the motor is overloaded and the main fuse blows. In that event, the motor stops, and before the controller can be shut off there is a circuit from the far end of the battery to the lamp through the resistance, controller and motor. Thus an 87-volt pressure is applied to the headlight. Bang goes the lamp and you can pick the pieces out of the headlight frame. So this is what caused the trouble.

It wasn't long before the circuits on all the storage-battery locomotives were changed over as shown in Fig. 3. Now when the fuse blows the lights remain on and do not burn out. E. E.

### Decrease in Rope Diameter Sign of Weakness

Most authorities on wire rope say nothing about inspection. A few mention that the number of broken wires which show up in so many feet of rope or in a rope lay is an indication of a reduction of strength. Only about one in ten point out that a decrease in overall diameter is another sign of weakness.

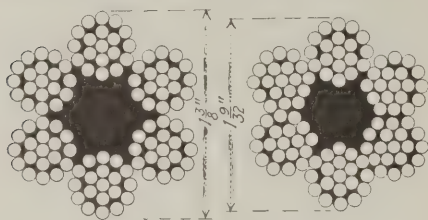
This feature was well illustrated recently at a shaft mine in West Virginia, where the rope broke while hoisting coal. The rope used at this shaft is a 1½-in., 6 x 19 plow-steel cable



with a hemp core. In the regular inspections attention was directed to the items of lubrication, broken wires, and visible wear. The last inspection, made just before the break, disclosed the following conditions: Apparently the rope was well lubricated; there were no broken wires in sight; and the visible wear on the outside wires, due to friction on the drum and head sheaves, was not of sufficient magnitude to cause alarm.

#### BROKE UNDER NORMAL LOAD

In view of the apparent good condition of the rope it was a great surprise to have it break, and especially so while operating under normal load.



#### Hemp Core Almost Gone

Section drawings of the same piece of rope, one at a point near the break and the other a few feet from it. Deterioration possibly might have been detected by the reduction in diameter.

The actual break occurred in that part of the rope which was in contact with head sheave when the attached cage was at its lowest position. An examination of the broken rope showed that for a distance of approximately 10 ft. on each side of the break, the

hemp core had been crushed to pulp, and that many of the inner wires had been materially reduced in section by corrosion and wear of the strands against one another.

#### DIAMETER OF CORE REDUCED

Naturally, the question then arose as to how this weakened condition could have been detected by inspection. During the investigation the rope was calipered at several points. The end sections were found to have retained practically their original diameter of  $1\frac{1}{2}$  in. and in those sections the hemp core looked as good as new. However, that part of the rope, extending about 10 ft. each side of the break, was found to have been reduced in diameter to  $1\frac{1}{8}$  in.

It will appear that if this reduction in diameter which was almost  $\frac{3}{8}$  in., had existed prior to failure it might have been noticed by the inspector. However, unless suspected it is likely that he would not have detected it because of the rather gradual taper toward the point of smallest diameter.

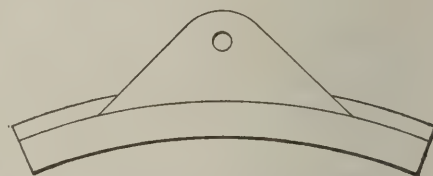
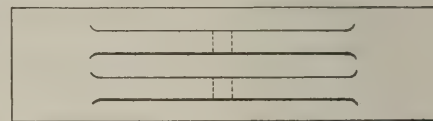
Repeated shocks not one of which would be sufficient to cause fracture may result in the failure of a rope. Suddenly applied loads approaching the elastic limit eventually tire out a rope and yet do not reduce its diameter until sometime a load, which ordinarily would not cause fracture, breaks it.

Nevertheless the experience in this particular case indicates that a thorough inspection, to determine the service conditions of hoisting rope, might well include measurements of the rope diameter.

mine track, as shown in the accompanying illustration. Brick walls and steel girders are used to support the roof.

### One-Piece Brake Shoe Has Many Advantages

In spite of the many good features of a brake shoe and head cast into one piece, many of the repairmen at the mines have not had an opportunity to use them. In the sketch is shown the general outline of such a shoe. Usually it is made of cast iron or cast steel.



#### No Fussing with the One-Piece Locomotive Brake Shoe

Only one pin is required to hold this shoe in place, no adjustments of course are necessary to replace an old shoe with a new one.

Sometimes it is made with carborundum or steel inserts. Carborundum inserts should be placed so that they will grind off false flanges and keep them from forming. When steel inserts are cast into a shoe they are primarily intended to prevent the shoe from wearing too quickly.

#### SHOE FITS ANY WHEEL

No matter of what material the one-piece shoe may be made or whether it has inserts or not, it has the one advantage that it may be used on any of the four wheels of the locomotive, no rights or lefts are needed. Keys, screws, pins and bolts require no adjusting on this type of shoe and therefore it is easy to place on the locomotive. An old shoe can be taken off and a new one installed merely by knocking out the holding pin and replacing it in the new shoe. The ease with which this work can be done and the savings in time and labor which result, quickly make it desirable to change from the two- to the one-piece shoe. The motorman can replace an old shoe even though he may be far inside the mines if only he has one available. The fact that he is not compelled to carry both a right- and a left-hand shoe is a big advantage to him.

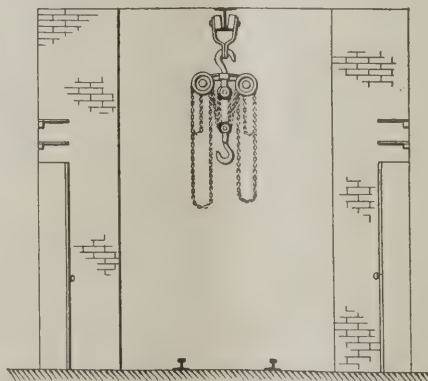
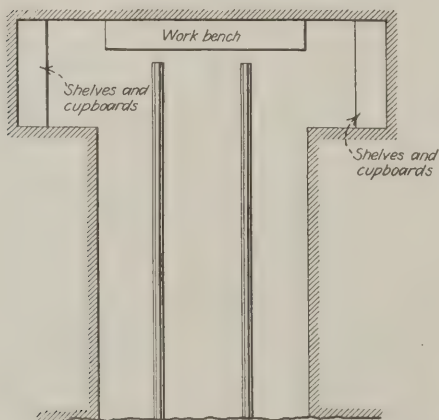
One large company using many different types and sizes of trolley locomotives changed the brake rigging on some of its locomotives so that this shoe could be used. Now only one type and size shoe is suitable for over 150 of its trolley type locomotives. Storage-battery locomotives use much smaller wheels and require a different size one-piece shoe.

### Underground Shop Planned to Prevent Weakening of Roof

Where the mine roof is of such a nature that it requires much support, it is wise to build an underground repair shop much longer than it is wide, enlarging the inby end for the accommodation of a work bench, tools and supplies. The plan view of the shop might well have the form of a T with horizontal arms of such moderate length that the area spanned would not be great enough to weaken the roof and yet would be large enough to af-

ford ample space for work. A shop like that just described was constructed in the Federal No. 1 mine of the New England Fuel & Transportation Co., Grant Town, W. Va. It is used chiefly for the repair of the undercutters, jackhammers and other compressed-air machines that are used extensively in this mine.

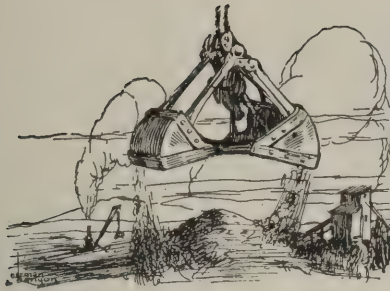
Small jobs can be done on the elevated platform adjacent to the bench at the same time as big jobs are being handled in the narrow section of the shop. An overhead crane travels on an I-beam in a direction parallel to the



#### Tee-Ended Shop Convenient as Well as Safe

This shop has an unusual shape but apparently the design is well chosen, for it gives more working space and a more effective reach to the crane without necessitating greater floor space and without making it necessary to support the roof with pillars.





# Production And the Market



## Expected Upturn in Coal Market Slow to Appear; Prices Cease Downward Course

Rough weather is the missing element for which the coal trade now hankers, for business has practically settled down to a weather proposition. In some quarters the waiting policy adopted by consumers was attributed to a supposition that a revival hinged on the outcome of the election, but the upturn that was expected to follow the re-election of President Coolidge has been of minor consequence thus far. As a matter of fact the general business situation shows an improvement, as reflected in heavier production and larger orders for steel, continued gradual gains in textiles and increased exports. Overseas coal shipments, however, have fallen off badly. Car loadings continue well above the million mark, but one of the most encouraging factors is the large volume of orders for rolling stock being placed by the railroads.

### Trade Lives on Hope

Though basic conditions are sound and sentiment is noticeably better, the trade is getting little nourishment in the way of actual returns, simply hanging in the belief that a taste of real winter will bring lagging consumers into the market with a rush. The ubiquitous Mr. Ford has broken out with a scheme for unloading coal from his Kentucky mines in the Northwest, and though not much is expected to come of it this year the dock operators are not exactly overjoyed at the prospect later on.

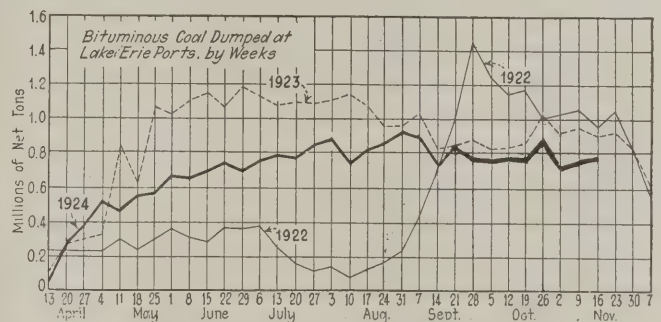
The hard-coal business continues a disappointment, demand being slow in the face of appeals and warnings to consumers against procrastination. The call for stove and chestnut holds steady, but egg and pea are moving only with some difficulty. Steam coals are quiet, barley being the best of the lot and No. 1 buckwheat the worst. Independent prices are holding their own fairly well, despite the recent boost in quotations.

Coal Age Index of spot prices of bituminous coal, after slipping for two weeks, came to a halt during the

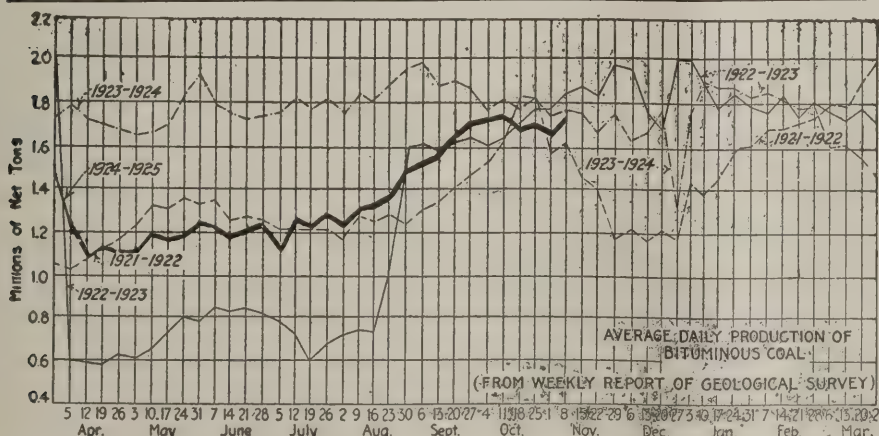
last week, standing on Nov. 17 at 170, the corresponding price for which is \$2.06, the same as the week before.

Activity at Hampton Roads registered a slight gain last week, dumpings of coal for all accounts during the seven-day period ended Nov. 13 totaling 356,603 net tons, compared with 325,568 tons the previous week.

There was a further increase in the movement of coal up the lakes, dumpings at Lake Erie ports during the week ended Nov. 16, according to the Ore & Coal Exchange, being as follows: For cargo, 753,405 net tons; for fuel, 30,875 tons compared with 704,538 and 30,937 tons respectively during the previous week.



Holidays again caused a decline in the production of bituminous coal during the week ended Nov. 8, when, according to the Geological Survey, 9,322,000 net tons was produced, compared with 10,065,000 tons in the preceding week, as shown by revised figures. The curtailment was due to the observance of All Souls' Day and election day. Allowing for the reduction in working time, the daily output actually was larger than during the previous week. Anthracite output, on the other hand, increased slightly during the week ended Nov. 8, 1,592,000 net tons having been produced, a gain of 148,000 tons over the preceding week, when the observance of Mitchell day cut heavily into production.



### Estimates of Production

(Net Tons)

#### BITUMINOUS

	1923	1924
Oct. 25.....	10,919,000	10,300,000
Nov. 1 (a).....	10,347,000	10,065,000
Nov. 8 (b).....	10,726,000	9,322,000
Daily average.....	1,788,000	1,726,000
Cal. yr. to date.....	475,551,000	392,849,000
Daily av. to date.....	1,797,000	1,485,000

#### ANTHRACITE

Oct. 25.....	2,001,000	1,927,000
Nov. 1.....	1,328,000	1,444,000
Nov. 8.....	1,903,000	1,592,000
Cal. yr. to date.....	80,724,000	77,726,000

#### COKE

Nov. 1.....	266,000	150,000
Nov. 8 (b).....	255,000	140,000
Cal. yr. to date (c)...	16,129,000	8,301,000

(a) Revised since last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.



## Midwest Idles Along

The weather simply is not rough enough for Midwest coal producers. Nothing else can be counted on to increase business and so nobody is inspired about trade. Of course there is some lump and egg business stringing along, but it is not large and most mines are unable to get more than three or four days a week and are troubled with fine coal even at that low production. Industrial pick-up is slowly going ahead but coal in storage and coal that has been contracted for the winter take care of about all the steam demand there is. Lump prices maintain themselves fairly well in most Illinois and Indiana fields but egg and 2-in. lump wobble. Even fine coal gets into distress these days.

West Kentucky is getting some trade throughout the Midwest and Northwest so that its output is cutting a considerable figure in steam and second class trade. Eastern Kentucky is moving into this territory in slightly larger volume because producers there see the end of the Lake season and are making extra efforts to sew up business elsewhere. They anticipate a real advantage over Midwest coals when the new lowered freight rates from the inner crescent region take effect. Pocahontas coal continues to move West in some volume but the tendency is toward price concessions, possibly because of the great amount of smokeless egg and mine run that reached the Midwest during the summer and early fall. No smokeless mine run

ever brings over \$2 now and most business is below \$1.75. Lump and egg has dropped from \$4.50 to \$4 as a minimum.

In southern Illinois railroad tonnage is unusually light. Mines are working from one to four days a week, depending upon this business. At a few of the biggest mines in southern Illinois there are mountains of screenings piled up on the ground, but this is about to end, for the cost of storing together with the cost of coal is running into figures that are amazing and there is always a danger of spontaneous combustion causing perhaps an entire loss. Some mines will suspend operations soon if conditions do not improve. Somewhat similar conditions prevail in the Duquoin and Jackson County fields except that no screenings are stored. Working time is poor and there is no market.

In the Mt. Olive district the movement goes with the temperature. A little coal is moving but nothing to speak of excepting railroad tonnage to the Northwest and a little steam and domestic to the Kansas City and Omaha markets. In the Standard field conditions are about as bad as they can be. Screenings have gone up to 75c., but 2-in. lump is down to \$2.20 and the other sizes are dragging.

## Weather Is Hard on Kentucky

Although a good many Kentucky mines are fairly well sold up, some cheap tonnage is being offered, jobbers running into direct sales of mines at as low as \$2.75 on Harlan block coal, whereas some of the good mines are asking

## Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern		Market Quoted	Nov. 19 1923	Nov. 3 1924	Nov. 10 1924	Nov. 17 1924†
Smokeless lump.....	Columbus....		\$4.85	\$4.35	\$4.35	\$4.00@ \$4.25
Smokeless mine run.....	Columbus....		2.15	2.25	2.05	1.75@ 2.25
Smokeless screenings.....	Columbus....		1.30	1.30	1.35	1.20@ 1.35
Smokeless lump.....	Chicago....		5.10	4.60	4.60	4.00@ 4.25
Smokeless mine run.....	Chicago....		2.25	1.85	1.85	1.75@ 2.00
Smokeless lump.....	Cincinnati....		4.85	4.10	3.85	3.50@ 4.00
Smokeless mine run.....	Cincinnati....		2.10	2.00	1.90	1.75@ 2.00
Smokeless screenings.....	Cincinnati....		1.35	1.15	1.15	1.10@ 1.25
*Smokeless mine run.....	Boston.....		4.40	4.45	4.30	4.25@ 4.40
Clearfield mine run.....	Boston.....		2.00	1.85	1.95	1.65@ 2.15
Cambria mine run.....	Boston.....		2.60	2.20	2.40	2.00@ 2.65
Somerset mine run.....	Boston.....		2.35	2.05	2.15	1.75@ 2.35
Pool 1 (Navy Standard).....	New York....		3.00	2.75	2.75	2.50@ 3.00
Pool 1 (Navy Standard).....	Philadelphia..		3.00	2.70	2.70	2.50@ 2.90
Pool 1 (Navy Standard).....	Baltimore....			2.45	2.30	2.10@ 2.50
Pool 9 (Super. Low Vol.).....	New York....		2.25	2.10	2.10	2.00@ 2.25
Pool 9 (Super. Low Vol.).....	Philadelphia..		2.30	2.15	2.15	1.95@ 2.35
Pool 9 (Super. Low Vol.).....	Baltimore....		2.05	1.80	1.70	1.65@ 1.80
Pool 10 (H.Gr. Low Vol.).....	New York....		2.00	1.90	1.85	1.75@ 2.00
Pool 10 (H.Gr. Low Vol.).....	Philadelphia..		1.85	1.75	1.75	1.65@ 1.90
Pool 10 (H.Gr. Low Vol.).....	Baltimore....		1.90	1.65	1.55	1.50@ 1.65
Pool 11 (Low Vol.).....	New York....		1.75	1.65	1.60	1.50@ 1.75
Pool 11 (Low Vol.).....	Philadelphia..		1.65	1.45	1.45	1.35@ 1.60
Pool 11 (Low Vol.).....	Baltimore....		1.75	1.55	1.45	1.40@ 1.50
High-Volatile, Eastern		Market Quoted	Nov. 19 1923	Nov. 3 1924	Nov. 10 1924	Nov. 17 1924†
Pool 54-64 (Gas and St.)..	New York....		1.60	1.50	1.50	1.40@ 1.60
Pool 54-64 (Gas and St.)..	Philadelphia..		1.65	1.50	1.50	1.40@ 1.60
Pool 54-64 (Gas and St.)..	Baltimore....		1.70	1.45	1.45	1.40@ 1.50
Pittsburgh sc'd gas.....	Pittsburgh....		2.55	2.40	2.40	2.30@ 2.50
Pittsburgh gas mine run.....	Pittsburgh....		2.25	2.10	2.10	2.00@ 2.25
Pittsburgh mine run (St.)..	Pittsburgh....		1.90	1.85	1.85	1.75@ 2.00
Pittsburgh slack (Gas).....	Pittsburgh....		1.05	1.20	1.15	1.10@ 1.25
Kanawha lump.....	Columbus....		3.00	2.55	2.55	2.35@ 2.75
Kanawha mine run.....	Columbus....		1.85	1.55	1.55	1.40@ 1.75
Kanawha screenings.....	Columbus....		.75	.95	1.00	.85@ 1.05
W. Va. lump.....	Cincinnati....		3.25	2.85	2.60	2.35@ 3.00
W. Va. gas mine run.....	Cincinnati....		1.50	1.55	1.45	1.40@ 1.50
W. Va. steam mine run.....	Cincinnati....		1.50	1.45	1.30	1.30@ 1.45
W. Va. screenings.....	Cincinnati....		.85	.90	.95	.85@ 1.10
Hoeking lump.....	Columbus....		2.90	2.55	2.55	2.40@ 2.75
Hoeking mine run.....	Columbus....		1.85	1.60	1.60	1.50@ 1.70
Hoeking screenings.....	Columbus....		.90	.75	.75	.65@ .85
Pitts. No. 8 lump.....	Cleveland....		2.55	2.40	2.30	1.95@ 2.85
Pitts. No. 8 mine run.....	Cleveland....		1.90	1.85	1.75	1.80@ 1.90
Pitts. No. 8 screenings.....	Cleveland....		1.05	1.00	1.00	1.05@ 1.15
Midwest		Market Quoted	Nov. 19 1923	Nov. 3 1924	Nov. 10 1924	Nov. 17 1924†
Franklin, Ill. lump.....	Chicago....		\$4.10	\$3.35	\$3.35	\$3.25@ \$3.50
Franklin, Ill. mine run.....	Chicago....		2.50	2.35	2.35	2.25@ 2.50
Franklin, Ill. screenings.....	Chicago....		1.45	1.35	1.35	1.25@ 1.50
Central, Ill. lump.....	Chicago....		3.10	2.85	2.85	2.75@ 3.00
Central, Ill. mine run.....	Chicago....		2.10	2.20	2.20	2.15@ 2.25
Central, Ill. screenings.....	Chicago....		.85	1.10	1.25	1.20@ 1.35
Ind. 4th Vein lump.....	Chicago....		3.35	3.10	3.10	3.00@ 3.25
Ind. 4th Vein mine run.....	Chicago....		2.60	2.35	2.35	2.25@ 2.50
Ind. 4th Vein screenings.....	Chicago....		1.20	1.30	1.45	1.40@ 1.50
Ind. 5th Vein lump.....	Chicago....		2.50	2.85	2.85	2.75@ 3.00
Ind. 5th Vein mine run.....	Chicago....		2.10	2.10	2.10	2.00@ 2.25
Ind. 5th Vein screenings.....	Chicago....		.80	.95	1.10	1.00@ 1.25
Mt. Olive lump.....	St. Louis....		3.10	3.00	3.00	3.00
Mt. Olive mine run.....	St. Louis....		2.25	2.35	2.35	2.25@ 2.50
Mt. Olive screenings.....	St. Louis....		1.25	1.10	1.10	1.00@ 1.25
Standard lump.....	St. Louis....		3.05	2.75	2.75	2.75
Standard mine run.....	St. Louis....		2.05	1.95	1.95	1.90@ 2.00
Standard screenings.....	St. Louis....		.55	.60	.60	.60@ .75
West Ky. lump.....	Louisville....		3.00	3.05	3.05	3.00@ 3.15
West Ky. mine run.....	Louisville....		1.65	1.60	1.60	1.50@ 1.75
West Ky. screenings.....	Louisville....		.60	.65	.70	.75@ .85
West Ky. lump.....	Chicago....		2.85	2.75	2.75	2.50@ 3.00
West Ky. mine run.....	Chicago....		1.75	1.65	1.65	1.40@ 1.70
South and Southwest		Market Quoted	Nov. 19 1923	Nov. 3 1924	Nov. 10 1924	Nov. 17 1924†
Big Seam lump.....	Birmingham..		3.85	3.10	3.10	2.75@ 3.50
Big Seam mine run.....	Birmingham..		1.95	1.60	1.70	1.50@ 1.90
Big Seam (washed).....	Birmingham..		2.35	1.85	1.85	1.75@ 2.00
S. E. Ky. lump.....	Chicago....		3.25	2.85	2.85	2.60@ 3.00
S. E. Ky. mine run.....	Chicago....		2.25	1.60	1.60	1.50@ 1.75
S. E. Ky. lump.....	Louisville....		3.50	3.25	3.25	3.00@ 3.50
S. E. Ky. mine run.....	Louisville....		1.85	1.45	1.60	1.50@ 1.75
S. E. Ky. screenings.....	Louisville....		.75	.95	.90	.85@ 1.05
S. E. Ky. lump.....	Cincinnati....		3.25	3.00	2.60	2.50@ 3.00
S. E. Ky. mine run.....	Cincinnati....		1.50	1.55	1.45	1.30@ 1.65
S. E. Ky. screenings.....	Cincinnati....		.85	.90	1.00	.85@ 1.10
Kansas lump.....	Kansas City..		5.10	5.00	5.00	5.00
Kansas mine run.....	Kansas City..		3.50	3.10	3.35	3.25@ 3.50
Kansas screenings.....	Kansas City..		1.00	2.00	2.00	2.00

\* Gross tons, f.o.b. vessel, Hampton Roads.

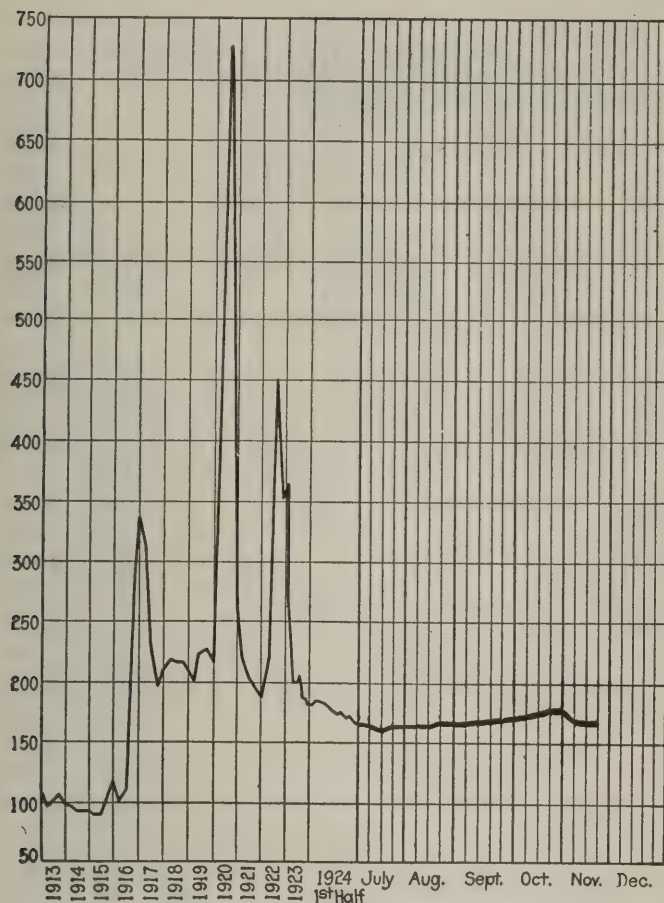
† Advances over previous week shown in heavy type, declines in italics.

## Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

		Market Quoted	Freight Rates	Nov. 19, 1923		Nov. 10, 1924		Nov. 17, 1924†	
				Independent	Company	Independent	Company	Independent	Company
Broken.....	New York		\$2.34	\$9.60@ \$10.50	\$8.00@ \$9.25		\$8.00@ \$9.25		\$8.00@ \$9.25
Broken.....	Philadelphia		2.39				9.15		9.15
Egg.....	New York		2.34	9.85@ 12.25	8.75@ 9.25	\$8.75@ \$9.50	8.75@ 9.25	\$8.50@ \$8.75	8.75@ 9.25
Egg.....	Philadelphia		2.39	9.85@ 12.20	8.75@ 9.25	9.45@ 9.75	8.80@ 9.25	9.45@ 9.75	8.80@ 9.25
Egg.....	Chicago*		5.06	9.60@ 12.50	8.00@ 8.35	8.17@ 8.25	8.14@ 8.20	8.17@ 8.25	8.14@ 8.20
Stove.....	New York		2.34	9.85@ 12.25	8.75@ 9.25	9.75@ 10.50	8.75@ 9.50	<b>10.00@ 10.50</b>	8.75@ 9.50
Stove.....	Philadelphia		2.39	9.85@ 12.20	8.90@ 9.25	10.10@ 10.75	9.15@ 9.50	10.10@ 10.75	9.15@ 9.50
Stove.....	Chicago*		5.06	9.60@ 12.50	8.00@ 8.35	8.63@ 8.75	8.50@ 8.64	8.63@ 8.75	8.50@ 8.64
Chestnut.....	New York		2.34	9.85@ 12.25	8.75@ 9.25	9.75@ 10.00	8.75@ 9.25	<b>9.75@ 10.25</b>	8.75@ 9.25
Chestnut.....	Philadelphia		2.39	9.85@ 12.20	8.90@ 9.25	9.85@ 10.50	9.15@ 9.25	9.85@ 10.50	9.15@ 9.25
Chestnut.....	Chicago*		5.06	9.60@ 12.50	8.00@ 8.35	8.26@ 8.40	8.44@ 8.60	8.26@ 8.40	8.44@ 8.60
Pea.....	New York		2.22	6.50 @ 7.75	6.15@ 6.65	5.00@ 5.50	5.50@ 6.00	5.00@ 5.50	5.50@ 6.00
Pea.....	Philadelphia		2.14	6.75 @ 9.00	6.35@ 6.60	5.75@ 6.00	6.00	5.75@ 6.00	6.00
Pea.....	Chicago*		4.79	6.00 @ 6.75	5.40@ 6.05	5.13@ 5.45	5.36@ 6.20	5.13@ 5.45	5.36@ 6.20
Buckwheat No. 1.....	New York		2.22	2.00 @ 2.50	3.50	2.00@ 2.50	3.00@ 3.15	2.00@ 2.50	3.00@ 3.15
Buckwheat No. 1.....	Philadelphia		2.14	2.25 @ 3.50	3.50	2.50@ 3.00	3.00	2.50@ 3.00	3.00
Rice.....	New York		2.22	1.50 @ 2.00	2.50	1.75@ 2.25	2.00@ 2.25	1.75@ 2.15	2.00@ 2.25
Rice.....	Philadelphia		2.14	1.75 @ 2.50	2.50	2.00@ 2.25	2.25	2.00@ 2.25	2.25
Barley.....	New York		2.22	1.00 @ 1.25	1.50	1.25@ 1.50	1.50	1.25@ 1.50	1.50
Barley.....	Philadelphia		2.14	1.00 @ 1.50	1.50	1.50	1.50	1.50	1.50
Birdseye.....	New York		2.22		1.60	1.35@ 1.60	1.60		1.60

\* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.





Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

Index	1924			1923
	Nov. 17	Nov. 10	Nov. 3	Nov. 19
Weighted average price	170	170	171	183
	\$2.06	\$2.06	\$2.07	\$2.21

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke; 1913-1918," published by the Geological Survey and the War Industries Board.

\$3@3.50 for prime block coal. However, there isn't much block moving at over \$3@3.25 due to mild weather and heavy production. It is believed that with cessation of Lake movement the heavy production of West Virginia and Kentucky non-union mines will meet with harder competitive conditions, which may make for slightly weaker prices, unless there is some really cold weather soon. Demand, which had been expected to improve right after election, hasn't picked up much as yet. Western Kentucky block and lump sizes have been a little weaker as a result of larger production, good traffic conditions and mild weather. Screenings also are about 10c. a ton higher than they have been, as a result of lighter production of prepared sizes. Mine run is rather draggy. Operators have been developing a better demand for small steam nut sizes, and almost all screenings are now being run down to pea and slack.

Despite the strike in Muhlenberg County, output in western Kentucky is around 55½ per cent of capacity. Prices show 6-in. block coal, \$3; lump and egg, \$2.50@2.75; nut, \$1.60@2.25; mine run, \$1.50@1.75; and screenings, 75@85c.

#### Northwest Has Some Cold

At Duluth cold weather and a touch of snow have had a salutary effect on the coal market and the docks are now working full time getting out orders. Features of the market are the failure of the supply of Pocahontas lump and the sharp drop in hard-coal receipts. Pocahontas is literally sold out in desirable sizes. The supply of hard coal is large, but there is little demand for it as yet, except from Dakota, which has come into the market stronger than in five years; nevertheless prices hold firm. Bitu-

minous holds as quoted last week. The general trend, however, is for strength.

Last week 37 cargoes were received at Duluth, of which one was hard coal, and 10 are reported on the way, of which only one is anthracite.

Cold weather has finally arrived in the Twin Cities and has helped to start long delayed buying. But unless the cold weather continues for a few days the effect will be short-lived, as the habit of buying for urgent needs only is not easily overturned. Dock prices are holding steady at former prices. All-rail prices are somewhat firmer, with southern Illinois lump at \$3.25@3.50, western Kentucky lump \$3 and central Illinois lump \$2.75.

Last week's Milwaukee report covers the situation there today. Coal is coming to Milwaukee quite steadily but it is not moving out again as freely as dealers would have it. Colder weather is needed. Receipts by lake and rail up to Nov. 1 total about 1,000,000 tons less than for the same period last year, but there was a holdover of about the same amount last spring.

#### West Depends on Weather

Demand in the Southwest continues weak, but so close has been buying by retailers that brief cold spells produce immediate orders. Prices are a bit firmer than last week. There is small surplus of screenings, as the slump in demand for domestic grades afforded an opportunity to rid tracks of oversupply accumulated early in the season.

A slight decrease in domestic coal output was noticed last week in Colorado, due to continued warm weather. However, it seems reasonable to believe that with the first spell of winter weather everyone will be extremely busy because of low stocks. Colorado mines worked 31 hours last week with 24 per cent of working time lost attributed to "no market." Prices have not changed since Oct. 20.

A cold snap in Utah has increased coal production in that state, but average working time is still only around three and a half days a week. The demand in regard to sizes of coal is well balanced again, but there is a slight tendency to a shortage of slack.

#### Softness Prevails in Ohio Markets

Cincinnati yearns for a touch of cold weather. The market is soft, slack and mine run being about the only sizes able to hold their own. Car interchange fell off nearly 1,000 during the week. Smokeless business is feeling the effects of the slowing up with New River, Dry Fork and other of the coals in this category selling below standard Pocahontas. The long dry spell has hit river business hard and practically all the retailers have caught up on orders. Some are offering inducements to encourage buying.

Both the domestic and steam trades are exceedingly dull at Columbus. Dealers are waiting for lower temperatures before placing orders and steam users also are playing a waiting game. Prices have weakened perceptibly and production also has suffered. Cancellation of orders placed during the short boom of several weeks ago is throwing much distress coal on the market. Pocahontas and other smokeless varieties are weaker and a price decline of 25c. a ton is reported. Splints also are weaker. Utilities are using a fair tonnage and railroad consumption is slightly better, but general manufacturing has not improved to any extent. Screenings are weak because of the large output and the fact that lake trade is nearly ended.

While no significant change has taken place in the demand for bituminous coal at Cleveland there is not as large a quantity seeking disposition as there was a week ago, and because of this, spot prices have rebounded 5c. to 10c. from the extreme low figures of last week. The mild weather has cut into lump production and the Lake shipping from the mines is dwindling. These two factors have caused a reduction in the quantity of slack being produced, inquiries for which are rather active.

#### Selling Difficult at Pittsburgh

Demand for coal at Pittsburgh has increased only slightly since election. Accumulation of coal on track has caused curtailed production at many mines. Consumers having arrangements for regular shipments have been taking coal much the same as formerly, but the open market demand has been very poor. Prices remain stationary despite the extreme difficulty of effecting sales.

The situation at Buffalo does not change much. Considerable coal was shipped here just before election by



sanguine operators, with the idea that the election alone would have sufficient influence to effect a sale of it. It did not. Shippers complain that the demand is not as good as it was last month. The principal reason is absence of cold weather. The Canadian trade is still poor. Some jobbers are staying out of it, for they say prices have to be very low to compete with Dominion coal. Little is doing in the lake trade.

Demand at Toronto is somewhat better and is improving steadily. Pennsylvania smokeless sells for \$5.85, steam lump at \$6.40, and slack at \$5 in carload lots, delivered.

### New England Yearns for Industrial Pick-Up

If anything, the New England market is easier and buyers are less in evidence. Certainly the Hampton Roads agencies have about given up hope of higher prices for the present, so few sustaining factors are there in the current market. Industrially there is no snap, and more than a few lines of business are muddling along with no bright prospect. Recent purchases of textile plants by rubber tire producers have caused comment, but the mills acquired are relatively small and the change in ownership will have little effect on cloth manufacturing as a whole. Meanwhile, steam coals are only in light request.

At Hampton Roads there are again small accumulations, but as yet there has been no pronounced dip in price, \$4.25 @ \$4.40 continuing about the range for Navy acceptable grades, with No. 2 coals selling off to the extent of 15@25c. Slack can still be had at minimum figures, and of this there is a fair amount of buying by consumers with automatic stokers. Offshore there is mild inquiry in response to the slight improvement in British trade, but not yet have there been purchases of any magnitude. What this year amounts to an average coastwise movement is about all that can be said for trade in this territory.

For inland delivery at Boston \$5.40 @ \$5.50 is about the present level on cars, with Portland and Boston commanding figures a trifle higher. Pocahontas and New River have the call from points well into the interior.

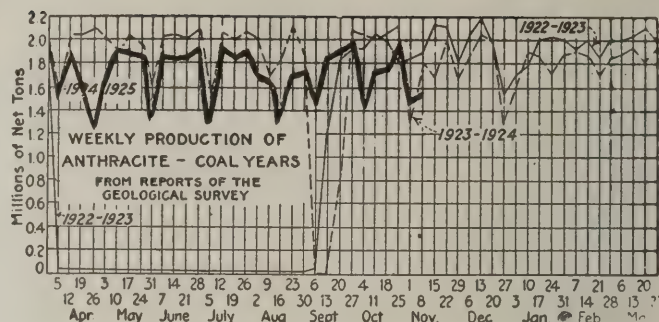
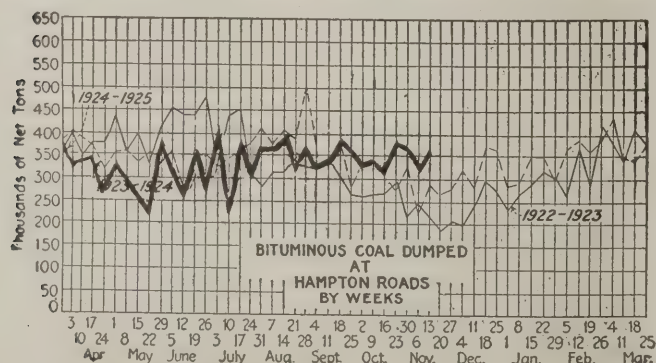
No developments can be seen in coals from central Pennsylvania; prices are on a cost basis.

### Atlantic Markets Quiet but Hopeful

General industry has not picked up sufficiently to increase the demand for soft coal at New York. Buyers continue to view the situation at a distance and are buying only for immediate requirements. Consumption is practically at rock bottom. The situation along the line and at tidewater shows comparatively no change from last week, either in prices or demand. Receipts at the piers show an increase in the average number of cars on hand and as a result there has been an oversupply at times, but not enough to drive prices to a lower level. Some consumers are taking one or two car lots when the price and quality of the coal are right.

The Philadelphia trade is more hopeful; inquiries are heavier and a larger proportion than usual is developing into orders. Consumers who have been buying at the market for months are inquiring as to contracts and a fair amount of business has been closed to April 1. General business conditions seem to be looking up. There is still a good supply of slack, due to the increased screening of coal, especially of the gas grades. The market at tide continues quiet.

The Baltimore coal trade is optimistic. The passing of the election followed by a brisk rise in the stock market leads



some coal men to believe that money will be released for industrial development, and that this will tighten up the coal trade. Meanwhile demand is only fair and prices are extremely low. Exports for the first two weeks of November have fallen far behind the same period of October.

The Birmingham market shows no material change. Domestic trade is suffering on account of adverse weather, both the wholesale and retail movement being slow and consumers showing indifference. There is a fairly good demand for steam, comparatively speaking, but neither inquiries nor sales are up to normal for this season. Prices in the steam market are unsatisfactory, affording a small margin of profit to the mines. Output for the week of Nov. 1 is reported as 355,000 net tons. Industrial conditions generally are showing a more favorable aspect since the election.

### Anthracite Markets Suffer Setback

The anthracite market at New York lacks activity. There is a steady demand for stove and chestnut coals but producers find it difficult to dispose of egg and pea sizes easily. The situation is dull, notwithstanding the appeals sent out to consumers to stock up while coal is available. Weather conditions are against consumption and consumers are not willing to buy until forced to. There is not much activity in the steam coals, No. 1 buckwheat lagging the most. Barley is in the best shape.

The retail trade at Philadelphia lost much ground this week, due to continued mild weather. Producers have practically enough orders on their books to absorb output, due to the October shortage. Egg is weakening, pea shows signs of dragginess and the demand for stove is beginning to run off, but nut is moving well. There are signs of weakness in the retail price situation, despite the fact that independent mine prices have generally risen.

Anthracite business at Baltimore continues rather listless because of the continued mild weather and the fact that many householders have now adopted the plan of buying in two-ton lots over the winter, as coal is needed, instead of placing in entire stocks in the fall or early winter. In order to combat oil-burning devices the trade is arranging to exhibit a buckwheat-burning furnace with mechanical blower attached. The yards are fairly well stocked.

Demand at Buffalo accords with the weather. Probably not more than half the amount of anthracite has been laid in here by consumers since last spring that ordinarily goes in in the same time. The families are burning natural gas, the schools and quite a good many other plants that once used anthracite to cut out the smoke, are using smokeless coal and they will never go back to the old fuel. The anthracite companies urge the use of small sizes, but are doing nothing, at least here, to introduce it. The demand for coke is as light as ever.

Owing to the prolonged spell of warm weather, demand for hard coal at Toronto is rather light. Anthracite is still retailing at \$15.50 and in plentiful supplies, but there is some scarcity of stove coal. No shortage is expected this winter, though.

### Car Loadings, Surpluses and Shortages

	Cars Loaded	
	All Cars	Coal Cars
Week ended Nov. 1, 1924.....	1,073,430	181,718
Previous week.....	1,112,345	193,736
Week ended Nov. 3, 1923.....	1,035,776	179,714

	Surplus Cars	
	All Cars	Coal Cars
Oct. 31, 1924.....	99,190	49,058
Oct. 22, 1924.....	94,153	46,476
Oct. 31, 1923.....	24,477	7,205

	Car Shortage	
	All Cars	Coal Cars
Oct. 31, 1924.....	12,336	3,068



## Foreign Market And Export News

### British Steam Coal Trade Perks Up; Output Above 5,000,000 Tons

The Welsh steam coal market has brightened somewhat, though a considerable extension of the present business is necessary before the market can be restored to normal. European inquiry has expanded, coaling depots abroad are showing a greater interest, and there also has been inquiry from other directions. The business booked, however, is not sufficient to keep the collieries busy, and during the past week 6,000 more men were thrown out of work. Curtailed output in conjunction with the slight increase in business has enabled the operators to maintain their prices.

The French Ministry of Marine is in the market for 43,000 tons best Admiralty large.

The Newcastle market has had a relapse from last week, and is flat and depressed. Shipments are very slow and operators are taking low rates for their coal. The Lithuanian State Railways are asking for 30,000 tons of steams, but otherwise there is no business to speak of. German competition abroad is keenly felt and the outlook is generally regarded as very unsatisfactory.

Production by British collieries during the week ended Nov. 1, a cable to *Coal Age* states, totaled 5,043,000 tons, according to official reports. This compares with 5,061,000 tons produced during the preceding week.

#### Hampton Roads Market Quiet; Foreign Trade Declines

The market at Hampton Roads is quiet, with bunkers and coastwise business only fair and with foreign movement rapidly on the decline. Nothing but extremely cold weather would give the market any stimulus, in the opinion of the trade.

Prices have softened and supplies at tidewater are somewhat lower, due to

lack of movement from the mines rather than to movement over the piers. The outlook for an immediate pick-up in business is not considered bright.

The tone of the market is dull, high-volatile coal alone holding its own. Inquiries have slumped and the spot market is more inactive than for the last six weeks.

#### French Markets Change Slightly As Mild Weather Lasts

The French industrial and domestic coal markets are practically unchanged since the beginning of the autumn. Due to mild weather, the consumption of house coals is low and some varieties of smalls and screened fuels are easier because of lack of demand. Imports from South Wales have been lower of late. Deliveries of semi-bituminous and sized products from Belgium, however, show a little more animation.

Canal freight is maintained at 25 fr. Béthune-Paris and 9.75-10 fr. Rouen-Paris.

Deliveries of indemnity fuels during the first twenty-six days of October to France and Luxembourg were 406,800 tons of coal, 288,800 tons of coke and 31,800 tons of lignite briquets, a total of 727,400 tons.

From Oct. 1 to 28 the total supply of coke to the O.R.C.A. amounted to 253,349 tons, a daily average of 9,050 tons. The M.I.C.U.M. having ceased its functions in the Ruhr on Oct. 28, deliveries of coke on the 29th were only 1,855 tons through Ehrang and 5,207 tons through Aix and on the 30th 1,576 and 2,917 tons respectively, a total of 11,555 tons for the two days. Since the 30th the German supply of reparation coke has practically stopped. French metallurgists, however, have enough fuel to live on until the fixation of the delivery programme by the Reparation Commission. If France's claims are

recognized she will get a supply of from 300,000 to 400,000 tons a month.

The output of coke in the French northern collieries is being intensively developed. The Courrières coal pits, where coke production has been hitherto unknown, are erecting 90 ovens of a capacity of 140,000 tons a year; 140 new ovens are under construction at Lens; the Noeux collieries are raising their annual production by 120,000 tons while the Aniche mines will hereafter produce 300,000 tons of coke annually.

#### Export Clearances, Week Ended Nov. 15, 1924

FROM HAMPTON ROADS	
For Canada:	Tons
Dan. Str. Hans Jensen, for Montreal	5,827
Ital. Str. San Guiseppe, for Three Rivers	6,985
Amer. Schr. Mary H. Siebold, for St. Georges	2,383
For Cuba:	
Br. Str. Berwindmoor, for Havana	9,608
For Egypt:	
Br. Str. Titan, for Port Said	3,566
For Italy:	
Ital. Str. Labor, for Genoa	5,723
Ital. Str. Robilante, for Porto Ferrajo	9,149
Ital. Str. Bosso Piave, for Savona	6,440
For West Indies:	
Jap. Str. Wales Maru, for Curacao	6,939
Amer. Schr. Susan B, for St. Stephens	600

FROM PHILADELPHIA	
For Cuba:	
Am. Str. Peter H. Crowell, for Havana	—
FROM BALTIMORE	
For Porto Rico:	
Am. Str. Delfina, for Puerto Real and Yacubroa	788
For Italy:	
Ital. Str. Enrico Toto, for Leghorn	6,736
For Ecuador:	
Br. Str. Arana, for Guayaquil	1,053

#### Hampton Roads Pier Situation

N. & W. Piers, Lamberts Pt.:	Nov. 6	Nov. 13
Cars on hand	1,215	949
Tons on hand	74,356	58,587
Tons dumped for week	96,083	117,017
Tonnage waiting	12,000	4,000
Virginian Piers, Sewalls Pt.:		
Cars on hand	1,731	1,706
Tons on hand	123,250	113,550
Tons dumped for week	108,842	109,911
Tonnage waiting	10,909	12,000
C. & O. Piers, Newport News:		
Cars on hand	1,950	2,220
Tons on hand	101,355	116,770
Tons dumped for week	87,547	91,468
Tonnage waiting	8,810	19,510

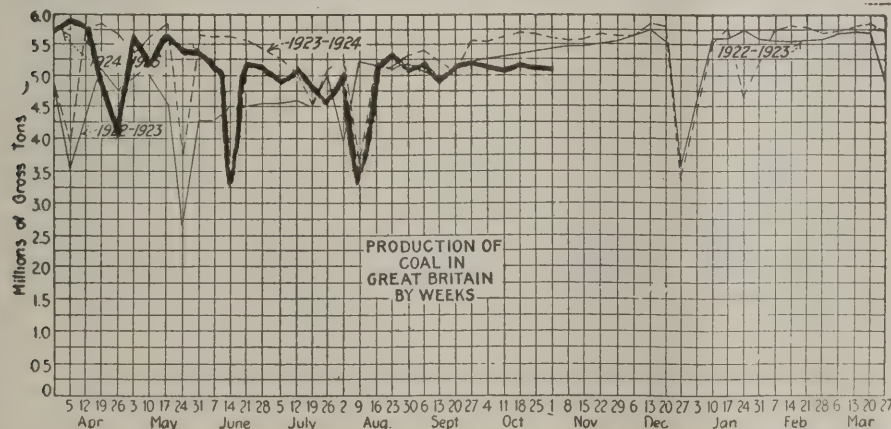
#### Pier and Bunker Prices, Gross Tons

PIERS		Nov. 8	Nov. 15†
Pool 9, New York	\$4.75@5.00	\$4.75@5.00	
Pool 10, New York	4.65@4.80	4.50@4.75	
Pool 11, New York	4.40@4.55	4.40@4.55	
Pool 9, Philadelphia	4.90@5.25	4.90@5.25	
Pool 10, Philadelphia	4.45@4.70	4.45@4.70	
Pool 11, Philadelphia	4.30@4.50	4.30@4.50	
Pool 1, Hamp. Roads	4.25	4.20	
Pool 2, Hamp. Roads	4.15	4.10	
Pools 5-6-7 Hamp. Rds.	4.00	4.00	
BUNKERS			
Pool 9, New York	\$5.00@5.25	\$5.00@5.25	
Pool 10, New York	4.90@5.05	4.75@5.00	
Pool 11, New York	4.65@4.80	4.65@4.80	
Pool 9, Philadelphia	4.90@5.25	4.90@5.25	
Pool 10, Philadelphia	4.75@4.95	4.75@4.95	
Pool 11, Philadelphia	4.50@4.70	4.50@4.70	
Pool 1, Hamp. Roads	4.35	4.30	
Pool 2, Hamp. Roads	4.20	4.20	
Pools 5-6-7 Hamp. Rds.	4.10	4.10	

#### Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations by Cable to Coal Age			
Cardiff:	Nov. 8	Nov. 15†	
Admiralty, large...	27s.@27s.6d.	27s.@27s.6d.	
Steam smalls.....	16s.	16s.@17s.	
Newcastle:			
Best steams.....	18s.	18s.3d.@19s.6d.	
Best gas.....	21s.@21s.6d.	20s.6d.@21s.	
Best bunkers.....	17s.6d.@18s.6d.	18s.6d.@19s.	

†Advances over previous week shown in heavy type, declines in italics.







## News Items From Field and Trade



### ALABAMA

The consummation of the merger of the properties of the Sloss-Sheffield Steel & Iron Co. and the Alabama Company awaits only the ratification of the directors of the respective companies, such approval being expected this week.

Rumors are current in the Birmingham district that important developments in the way of additions and betterments at local plants of the Tennessee Coal, Iron & Railroad Co. will soon be announced.

The Edgewater mine of the Tennessee Coal, Iron & Railroad Co., the largest colliery in the Alabama field, produced a record tonnage of 127,825 tons in October as against record of 104,562 tons mined in August. The blast furnaces of the Tennessee company broke all previous records with an output for the month of 127,925 tons.

### COLORADO

The Rocky Mountain Fuel Co. is said to be concentrating its production largely in the Columbine mine, in the northern Colorado field, and in the Southwestern mine, near Aguilar, in the southern part of the state.

The Bluff Springs Coal Co., which has worked one or two properties near Canon City, is about to open the old Donnelly slope near Coal Creek. The mine has been rehabilitated and electrified.

Fred Farrar, according to newspaper reports, is to retire as executive vice-president of the Colorado Fuel & Iron Co., to re-engage in general practice of law, but will continue as general counsel for the company. The announcement comes from President J. F. Welborn. Mr. Farrar is one of the foremost members of the Colorado Bar. He has been practicing law in the state twenty-three years. From 1913 to 1916 inclusive he was Attorney General of the state. In July, 1918, he became general counsel for the Colorado Fuel & Iron Co.

Local strikes have caused some lost time recently in the Walsenburg region. At Morning Glory mine the men struck rather than pay \$2 for the recharging of cap lamps. At Pictou the force walked out because two men were fired for inhumane treatment of a mule.

The Colorado Fuel & Iron Co. in a movement toward concentration of production, has closed three mines in the Trinidad field employing over 600 men and producing approximately 50,000

tons of coal per month. The mines are Sopris No. 2, with a personnel of about 317 men and a monthly production of 25,000 tons; Tabasco, 193 men, 17,000 tons monthly, and East Side Primero, with 92 men. The entire Primero mine produced about 13,000 tons monthly; East Side was the major operation.

The Victor American Fuel Co. has just reopened Radiant mine, in the Canon City field, in Fremont County. Radiant, a commercial producer, has been closed since last March. It employs 150 miners.

### ILLINOIS

The Benton Coal Co. has opened its No. 1 mine near that city and will operate steadily, employing between 500 and 600 men. The mine is one of the first in the Benton district to resume work.

Harry F. Goodnow, formerly chief mining engineer for the Majestic Coal & Coke Co., and later superintendent of the Crerar-Clinch properties at Johnston City, is now connected with the Gayle Coal Co., at Du Quoin, a new stripping operation operated as a subsidiary of the two former concerns.

The large wash house at Mine No. 14, Old Ben Coal Corporation, Buckner, was destroyed by fire last week. The building was constructed of brick, with a tile roofing and was considered almost fireproof. Officials of the mine are at a loss to determine the origin of the fire.

The records of both Zeigler mines were again broken in October with a total production of 313,644 tons. Zeigler mine No. 1 has produced in the last eighteen years a total of 12,632,615 tons.

Two Williamson County strip mines in the vicinity of Cartersville have been reopened upon a full time schedule. Weaver mine No. 20 plans to resume operations soon, after having been closed down since last November.

A cage at Orient No. 2 mine of the Chicago, Wilmington & Franklin Coal Co., loaded with thirty-six miners was dumped at the top of the tippie Nov. 7 at the end of a day's work, throwing the men into the weigh hopper about 30 ft. below. Only three men were injured seriously enough to require hospital attention.

John Meyer, assistant foreman of the large Kathleen mine of the Union Colliery Co., at Dowell, has resigned on account of ill health, and has gone to St. Louis to live with his family.

### INDIANA

H. Clarence Bean, formerly with the Jewel Coal & Mining Co. and the Sterling-Midland Coal Co., with operations in Illinois, has been made general superintendent over three mines of the Coal Bluff Mining Co., at Terre Haute. The three mines are all in operation at present.

The Brazil Collieries Co., at Brazil, has filed a final certificate of dissolution.

The Wheatland Standard mine, at Bicknell, which has been closed down for several weeks in a controversy over the installation of a loading machine at the mine, probably will resume work soon, officials say. As a result of a conference held in Indianapolis last week, at which Wheatland miners were delegates, it was agreed that the mines keep the machines in operation during the testing stages. Later a meeting will be called to arrange a permanent wage scale.

Fire which was discovered Nov. 7 in the Indian Creek mine, at Bicknell, has caused the sealing of the mine with the possibility that it will not work again for many weeks. The men working at the mine "skinned up" and the fan was stopped Friday night to permit a change from steam to electric power. On Nov. 11, however, the mine boss discovered the fire and also evidences of an explosion. In a way it is believed to have been both harmful and helpful that the fan was down. Had it been operating, it probably would have blown out the smoke and caused the fire to be discovered sooner. But, had it furnished oxygen to the explosion, it might have caused a blast of much greater proportions.

D. C. Stephenson, former grand dragon of the Ku Klux Klan in Indiana, has announced the sale of the Central States Coal Co. to L. G. Julian, of Evansville, for a total sum, he said, of \$200,000. He has accepted a position as general manager of a New York firm at a salary of \$25,000, he said. He refused to give the name of the company. He said also that he had caused to be written into the contract for the sale of the company a provision that the company could not sell its product to the state during the term of the next Governor.

Carl J. Fletcher, vice-president of the Knox Coal Mining Co., has been named receiver for the J. & I. Coal Co., of Indianapolis. The appointment was made on petition of the E. & J. Coal Co., plaintiff in a suit to foreclose a \$3,500 mortgage on the J. & I. property. The appointment of a receiver



was asked pending hearing of the suit. Owners of the defendant company are John D. Johnson, Willard E. Jackson and Catherine Shearman.

## KANSAS

A further effort to lay the Alexander Howat ghost in District 14, United Mine Workers, is contained in a letter by the district board to locals, reiterating the recent warning by President Lewis that Howat is ineligible for the presidency of the district and declaring that Howat's name and the names of his associates will not appear on the ballot for the December election. Many locals have disregarded Lewis's message and have placed Howat in nomination for the office. In its supplementary letter the board warns of the possibility of the district again losing its autonomy, as it did in 1921, following the outlaw strike called that year by Howat, then president, and his associates.

## KENTUCKY

L. W. Fields, of Lexington, and associates have purchased a large tract of coal and timber land in Letcher County.

Shelby Elliott, 26, president of the Big Four Coal Co., Louisville, is recovering from injuries received in a recent motor accident in which a car that went dead blocked the road and caused a triple collision in the dark.

Forest fires in Kentucky have caused a great deal of damage and some of the coal companies have lost a lot of timber, but no mine buildings have been burned. Early frosts were followed by weeks of dry weather, and the country was brown and dry. The West Kentucky Coal Co., in western Kentucky, is reported to have suffered some timber loss.

The Elkhorn Coal Co. is about to begin erection of a \$20,000 store building in Master.

The Hamilton Mining Co., Cromwell, Ohio County, western Kentucky, recently reported that cables furnishing current to the mine had been cut during the night of November 4, putting the mine out of commission until the

breaks were located and splicings made. The company is operating in spite of the union strike in nearby Muhlenberg and Hopkins counties.

## OHIO

The tippie of the Eagle Coal Co. mine, south of Zanesville, was totally destroyed by fire recently, entailing a loss of about \$75,000. All of the equipment was destroyed and the mine will be out of commission for some time. The flames caught from a fire in a woods adjoining the tippie.

Officials of the Middle States Coal Co., of Columbus, are making an exhaustive investigation of the dynamiting of tipples No. 24 and No. 68 on its property in the Hocking Valley, which occurred several weeks ago. One of the tipples together with the power plant and all equipment was totally destroyed. Arrests will follow if the investigation reveals the culprits.

## PENNSYLVANIA

Lee, Higginson & Co. and Cassatt & Co. are offering a new issue of \$5,000,000 South Penn Collieries Co. first mortgage sinking fund Series A 6 per cent bonds, due Nov. 1, 1944, at 94½ and interest, to yield over 6½ per cent. The bonds are secured by a first mortgage on all fixed properties and leaseholds of the company.

Directors of the Glen Alden Coal Co. have declared a dividend of \$3.50 a share, payable Dec. 20 to holders of record Nov. 29. An initial dividend of \$1.50 a share was paid Dec. 20, 1922. A payment of \$2 was made June 20, 1923, and one of \$2.50 was made Dec. 20, last year. On June 30 last, \$3.50 a share was paid.

Announcement has been made that the firm of Peale, Peacock & Kerr, Inc., leading coal operators in central Pennsylvania, with offices in Philadelphia and New York city, have purchased from Mrs. Anne W. Penfield, of Philadelphia, formerly of Williamsport, 5,000 acres of coal land holdings in English Centre, Lycoming County. The engineer's report shows that there are 30,000,000 tons of bituminous coal under the sur-

face of the land bought and it is proposed to mine the coal and market it by building a railroad from the mines to Cedar Run, on the New York Central R.R. Mrs. Penfield still has 10,000 acres of coal land in the same vicinity. Rembrandt Peale, senior member of the purchasing firm, resides in St. Benedict, Clearfield County.

Robert H. Lansburgh, new Secretary of Labor and Industry, in announcing his policy for the conduct of his department, notified inspectors that they must devote seven hours to actual work a day five days a week and three hours on Saturday. Inspectors were told they can recommend any safety devices indorsed by the department and the State Industrial Board, but that they may not pick out any one device for special recommendation.

The Wolfe Coal Co. will soon open a new stripping operation near its mines between Lattimer and Drifton and has awarded the contract for the operations to the Schraner Construction Co., of Scranton. A steam shovel will be moved from the present operations to the new job next week.

Committees representing each of the five Pennsylvania districts, United Mine Workers, were appointed at a meeting at Harrisburg, Nov. 12 of the various executive committees, to study the mining laws with a view to making certain recommendations to the next Legislature. The committees are to determine what legislation, in their opinion, is needed and report at a general conference prior to the meeting of the General Assembly. The conference date will be determined later.

Orders have been issued to blow in immediately 340 additional ovens at the H. C. Frick plants at York Run, Phillips, Collier, Continental No. 1 and Hecla. It is understood that more ovens will be placed in operation soon.

The Mahanoy Valley Coal Co., idle the past few months, has resumed operations at its washery at Girardville, adding another feeder to the tonnage which the Hazleton & Mahanoy Division of the Lehigh Valley R.R. sends to the anthracite markets.

## UTAH

J. A. Stallings, sales manager of the Spring Canyon Coal Co., who has been seriously ill for some months, is much improved and is now able to spend a short time in his office each day.

L. C. Karrick, a Salt Lake City engineer, has been appointed to take a part in the research work started by the Carnegie Institute of Technology which has for its purpose the elimination of the smoke problem in large cities.

George H. Dern, who has been chosen next Governor of Utah, is a prominent Salt Lake City mining engineer.

Sam Woodhead was re-elected county commissioner of Carbon County over T. A. Stroup, superintendent of the Clear Creek mines of the Utah Fuel Co., at the Nov. 4 election by a plurality of 393. Mr. Stroup was at the disad-



Main Haulage Road at No. 1 Mine North-East Coal Co.

This steel bridge has been constructed on the main haulage road between the "High Bridge" opening of No. 1 Mine and the older part of that mine, near Thealka, Ky. The steel section of the bridge is 600 ft. long. Wood approaches, 54 and 56 ft. long, have been built at either end. At the highest point the rail is 116 ft. above the fertile valley. This is the highest mine-car trestle in eastern Kentucky.



vantage of being on the Democratic ticket in a strong Republican year. However two other Democrats were elected to the commission for short terms. George H. Dern, a Democrat, beat Gov. Charles R. Mabey, Republican, both in Carbon County and in the state, and therefore takes the executive chair.

The United States Fuel Co. has appointed R. W. Sheppard district sales manager with offices at Portland and Seattle. Mr. Sheppard is a North-western man and has had considerable experience in the coal business.

William C. Stark, manager of the Citizens Coal Co. of Salt Lake City, and former president of the Utah-Idaho Retail Coal Dealers' Association, has been elected a member of the state House of Representatives. Mr. Stark was a member of the last Legislature. Elias S. Woodruff, who was a partner in the recent Woodruff-Sheets-Morris Coal Co., also has been elected to a seat in Utah's legislative body.

The Rains mine of the Carbon Fuel Co., which was wrecked by an explosion in September, resulting in the loss of five lives, has been reopened. The official report on the cause of the explosion has not yet been made.

## WEST VIRGINIA

Officials of the union in southern West Virginia make no secret of the fact that although a few years ago the United Mine Workers had about 50,000 members in West Virginia, its membership is now less than 15,000, 12,000 of whom are employed in northern West Virginia mines. Union officials are inclined to blame their loss of membership on existing economic conditions.

Although seriously injured, suffering from a fractured skull and four broken ribs, sustained in an accident, it is believed that W. T. Hughes, president and general manager of the Fort Grand Coal Co., operating in Monongalia County, will recover. Mr. Hughes, with several employees had gone to a voting place in the county and was turning his car around when it slipped over a bank to the bed of a creek 60 ft. below. Only last July Mr. Hughes suffered a broken leg in an accident and had only recently been able to discard crutches.

When 18 or 20 miners ceased work and joined the United Mine Workers at the plant of the Sitnek Coal Mining Co., at Lumberport, in the Harrison County field, on Nov. 7 there was a temporary cessation of operations but it is stated by officials of the company that the Katherine mine was working as usual the following day with 50 miners. The company also states that it is still producing from 9 to 10 cars of coal a day. The officials of the union on the other hand claim that 100 miners at the plant are organized and that not more than 15 miners remain at work.

Eviction suits brought by the New England Fuel & Transportation Co. to gain possession of a number of houses at Everettville, in Monongalia County, have been settled out of court under an agreement with counsel rep-

resenting the coal company and the United Mine Workers. Originally the suit was brought against 37 occupants of company houses, but since the time of filing the suit fourteen families have moved, leaving 23 who are covered by the agreement, which provides that the miners remaining in possession of company houses shall vacate on or before Jan. 5, 1925.

In connection with the semi-annual meeting of the West Virginia Mining Institute to be held on Dec. 3 at Welch, a first-aid and mine-rescue contest is to be staged with at least forty teams from Mercer and McDowell counties participating. Only a few days ago W. H. Forbes, assistant mining engineer in charge of work for the U. S. Bureau of Mines in West Virginia, returned to his headquarters at Huntington from the Pocahontas field, where he had been assisting in making preparations for the first-aid contest, which is to be in charge of C. C. Morfitt, secretary of the Tug River Operators' Association, assisted by Joseph Reed, safety director of the Consolidation Coal Co. and president of the West Virginia Mining Institute. R. M. Lambie, chief of the department of mines of West Virginia, has been in the Pocahontas field for several days in preparation for the first-aid contest.

## WYOMING

Having this summer completed water systems for the company camps of Hanna and Winton, the Union Pacific is now constructing a new water system for Reliance. The new wells also will supply the Union Pacific R.R. switching locomotives with water, relieving a drain on the Rock Springs system.

## CANADA

The Coal Creek Collieries of the Crows Nest Pass Coal Co., have been closed down indefinitely. W. R. Wilson, president and general manager of the company, explains that lack of trade makes continuance of work at present out of the question. It is understood that the Michel Collieries are to continue production. The company's decision throws 750 men out of work and the provincial government has sent a deputy Minister of Labor to inquire into the situation.

The Western Fuel Corporation of Canada has moved its sales office from Nanaimo, where it was established more than 70 years ago, to Vancouver. J. G. Lawrence is the general sales manager and W. A. Webb, formerly agent for the company in Vancouver, has been made assistant sales manager.

The Princeton (B. C.) Collieries, Ltd., which absorbed the Princeton Coal & Land Co. eight months ago, has uncovered a 22-ft. seam of bituminous coal.

The government of Alberta has appointed a commission to make a comprehensive survey of the coal industry of the province, including methods of marketing on the prairies. The commissioners are H. M. E. Evans, who is largely identified with the industry in

northern Alberta, chairman; Robert C. Drinnan, director of the Mountain Park and Luscar Collieries, representing the operators, and Frank Wheatley, president of the Alberta Federation of Labor, Blairmore, representing labor.

The existence of coal deposits in the Sudbury district of Ontario has been known for many years, but whether the field was commercially valuable has been a subject of much controversy. The government geologists who have made investigations usually have taken an unfavorable view. The Colonial Coal Co., of Toronto, after preliminary diamond drilling, has come to the conclusion that mining can be profitably undertaken and is putting down a shaft. The progress of the work will be watched with much interest as a possible step toward the solution of Canada's fuel problem.

## New Companies

**The Cabin Creek Coal Co.** has been incorporated in Walch, Okla. by L. M. Green and H. E. Ryker, of Walch, and H. L. Cheyne, of Miami, Okla.

**The Glen Mary Coal Co.** James Building, Chattanooga, Tenn., has been incorporated with a capital stock of \$50,000 by H. B. Bonney, E. W. Elmore, J. F. Falzow and others and will acquire and develop property at Glen Mary, Tenn.

**The Saxton Blue Gem Coal Co.** has been incorporated in Saxton, Ky., by J. M. Persifull, James Percifull and others.

**The New Coal Co.** has been incorporated in Pineville, Ky., by M. M. Cox, H. I. Cawthern and M. Brandenburg.

**The Ohio River Edison Coal Co.** Knoxville Village, Ohio, has been chartered with an authorized capital of \$200,000 to mine coal and deal in coal and coke. Incorporators are Union C. DeFord, Donald J. Lynn, T. Lamar Jackson, Norman A. Enery and David E. Jones.

**The Diamond Clay Products Co.** Ironton, Ohio, has been chartered with an authorized capital of \$1,200 shares, no par value designated, to operate coal properties. Incorporators are M. P. Krag, Wm. H. Myers, H. S. Miller, W. H. Webb and Robert J. Beatty.

**The Cedar Grove By-Product Coal Co.** has been organized with a capital stock of \$25,000 to operate at Fred, W. Va., in the Kanawha field. Active in organizing this company were John D. Alexander, W. A. Alexander, Elizabeth Alexander, S. V. Morris and H. C. Ferguson, all of Charleston, W. Va.

## Industrial Notes

**The Fuller-Lehigh Co.** has entered into an agreement whereby everything in connection with its pulverized coal business will be handled in the various countries throughout the world by **Babcock & Wilcox, Ltd.**, of London, with the exception of the United States, its dependencies, Canada and Mexico.

**The Beaudry Co., Inc.**, manufacturer of forging hammers, recently moved into its new factory, on the Revere Beach Parkway, Everett, within three miles of the business center of Boston. The main building is 70 x 140 ft., of concrete and steel sash construction, and has the most modern equipment.

**The Combustion Engineering Corporation** announces that James Cleary, formerly manager of their Philadelphia office, will assume management of the Detroit and Cleveland territories with headquarters in Detroit. Frank Henderson will continue in charge of the Cleveland office. Joseph Lappin, formerly in charge of the Detroit office, has been assigned to New York for special work. The Detroit office has been removed from the Penobscot Building to the Book Building, 1227 Washington Boulevard.



## Traffic

### Approve New Rates in New York

The Public Service Commission of New York has approved joint rates on coke, coke breeze, coke dust and coke screenings, the direct products of coal, in carloads on the Delaware, Lackawanna and Western R.R. from Harriet to various stations on the Buffalo, Rochester & Pittsburgh; of the Lehigh Valley from Harriet to various stations on the Buffalo, Rochester & Pittsburgh and the Pennsylvania R.R.; of the New York Central (east) from Harriet to various stations on the Buffalo, Rochester & Pittsburgh and Pennsylvania R.R., effective Dec. 7 to 9, 1924. No joint rates have hitherto been in effect.

Approval also has been given to new rates on the same commodities on the New York Central (West) from Buffalo and East Buffalo to Derby of \$1.13 per net ton (reduction, 13c.); to Portland, \$1.39 (reduction 12c.); to Van Buren, \$1.39 (increase, 13c.), and to Westfield, \$1.39 (reduction, 12c.), effective Dec. 10, and to reduced rates by the New York, Chicago & St. Louis R.R. on the same products from Buffalo and Buffalo Junction to various stations west, effective Dec. 10.

### Hearing to Consider Proposal to Advance Hard-Coal Rates

The Coal and Coke Committee, Trunk Line Territory, announces a Public Hearing, 11 a.m., Dec. 4, at 143 Liberty Street, New York, on a carriers' proposal to advance rates on anthracite, buckwheat and smaller sizes, from Taylor, the Scranton-Taylor Coal Co.'s washery at Pyne and Jermyon No. 1 collieries to stations on the Delaware, Lackawanna & Western R.R., Forty-Fort, Pa., to Plymouth, Pa., inclusive. The present rate is 88c. per gross ton and the proposed rate is \$1.01 per gross ton. The reason for the proposal is to remove violation of the long and short-haul clause of the Pennsylvania State Constitution.

### Indiana Coal Fields Fear Rate Discrimination

Coal producing fields of the Wabash valley are vitally interested in the Interstate Commerce Commission's hearing on coal freight rates from Ohio and West Virginia to Indiana points, set for Nov. 28 at Indianapolis. If further decreases are granted in rates from Ohio and West Virginia, as petitioned by the Indiana State Chamber of Commerce, without a corresponding adjustment between Indiana points and from the Indiana fields to Michigan and other points north and west it is felt that the Indiana producers will suffer.

The Terre Haute Chamber of Commerce co-operated with the State Chamber in the rate equalization fight which resulted in the present tariffs, making it possible for Indiana to compete more easily with Ohio and West Virginia. In the hearing set for Nov. 28 the Terre Haute Chamber of Com-

merce will appear to protect the interests of the Indiana producers and miners, but the petition of the state chamber asks for a further reduction of rates from the Ohio and West Virginia fields to Indiana points.

## Association Activities

"Pioneer Development of the Coal Mining Industry in Northern Cambria County" was the subject of an interesting address delivered by James A. McCain, banker and former coal operator, at the seventh semi-annual meeting of the Mining Institute of the Fifteenth Bituminous District of Pennsylvania, held in Barnesboro, Pa., on Nov. 1. Other speakers at the meeting were W. F. Dill, of Barnesboro; W. G. Duncan, of Connellsville; J. F. MacWilliams, of Cresson; J. I. Thomas, of Johnstown; E. A. Holbrook, dean of State College; Joseph Williams, of Altoona; J. T. Ryan, of Pittsburgh; N. D. Hubble, of State College, and Prof. William R. Chedsey, of State College.

## Obituary

George F. Cant, of Huntingdon, Pa., who was an operator of coal mines in Cambria County, died suddenly at his home in Huntingdon, Nov. 2. For the last six months Mr. Cant's heart had been affected, but his death was sudden. He operated the Warren Collieries, at Nanty Glo, Pa., for the past six years. Prior to that he had been engaged in operating a gold mine in North Carolina, and bituminous coal mines in the Broad Top section, Bedford County, Pa.

Henry J. Burton, Sr., 60, widely known mining engineer and formerly a mine examiner, died at his home in Pana, Ill., Nov. 3, after having been in bad health for five years. He leaves a widow and two children.

W. H. Lake, a leading business man of Pictou, Ont., died suddenly Nov. 2, aged 82 years. He had been engaged in the coal trade for many years until his retirement a few months ago. He leaves a wife and one daughter.

W. Hubert Young, age 43, a prominent coal man of Oneonta, Ala., died Nov. 12 in a local infirmary after a short illness.

## Coming Meetings

Lehigh Valley Section of American Institute of Electrical Engineers. Annual meeting, evening of Nov. 21, Schuylkill Country Club, Pottsville, Pa. Member Executive Committee, W. H. Lesser, Frackville, Pa.

Illinois Mining Institute. Annual meeting, Nov. 22, Elks Building, Springfield, Ill. Secretary, Martin Bolt, Springfield, Ill.

National Exposition of Power and Mechanical Engineering. Annual exposition, Dec. 1-6, Grand Central Palace, New York City. C. F. Roth, Grand Central Palace, New York City.

American Society of Mechanical Engineers. Annual meeting, Dec. 1-4, Engineering Societies Building, 29 West 39th St., New York City. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

West Virginia Coal Mining Institute. Annual meeting, Dec. 2-3, Welch, W. Va. Secretary, R. E. Sherwood, Charleston, W. Va.

Coal Mining Institute of America. Annual meeting, Dec. 3-5, Chamber of Commerce Bldg., Pittsburgh, Pa. Secretary, H. D. Mason, Jr., Box 604, Ebensburg, Pa.

West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers. Fourth annual convention, Dec. 12 and 13, Huntington, W. Va. Secretary-Treasurer, Herbert Smith, Huntington, W. Va.

American Institute of Mining and Metallurgical Engineers. Annual meeting, Feb. 16-19, 1925, 29 West 39th St., New York City. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

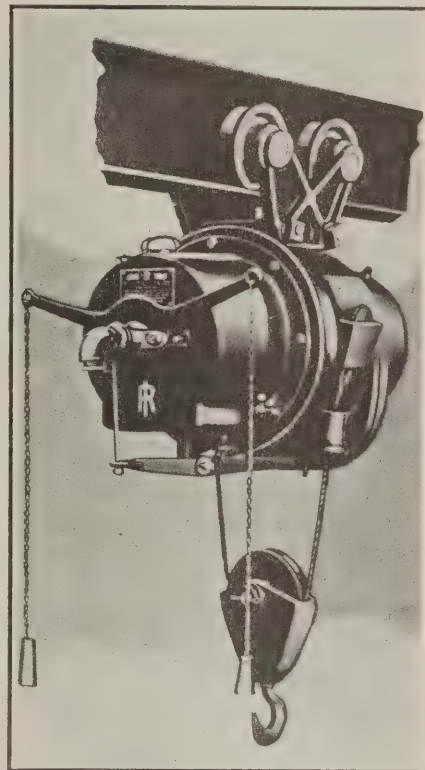
American Institute of Electrical Engineers. Midwinter convention, Feb. 9-13, 1925, 29 West 39th St., New York City. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

## New Equipment

### These Air-Motor Hoists Are Fit for Many Jobs

The new line of air-motor hoists recently developed by the Ingersoll-Rand Co., 11 Broadway, New York, contain many novel and distinctive features and in addition possess all the essential features which two decades of familiarity with the field has shown the manufacturers to be necessary.

The new hoists are suited for a wide



Air-Driven Shop Hoist

These units are ruggedly built, if greatly overloaded they merely balk, but can be started up again when the load is reduced without any serious effects.

range of service and are used in all manner of industries where rapid and economical lifting and handling of loads is desired.

The 500-lb. capacity hoist was recently put on the market but now the company has developed four larger sizes of similar design so that the same type of hoist is available for heavier work. The four new sizes embody all the features of the smaller hoist except for such variations as in the gearing on the two heaviest sizes, etc.

The outstanding characteristics of the new hoists are briefly as follows: Compactness of design, resulting in low headroom required; relatively light weight; automatic brake which positively holds the load under all circumstances—even if the air supply should become disconnected or fail; and a



graduated throttle which permits a very close regulation of both the lifting and the lowering speeds.

A balanced three-cylinder air-motor is used which operates in either direction and without vibration at any speed or load and within the rated capacity of the machine. The new motor retains all of the best features which have established their worth by long service, and furthermore embodies new features which add to its economy and durability. Some of the advantages of this motor are its freedom from vibration, the ready manner in which it can be throttled down slowly at all loads and its remarkable absence of lubricating troubles, even when subjected to considerable neglect and abuse.

It should therefore be noted that these hoists are entirely distinct from direct acting cylinder hoists and lifts. The latter consist essentially of only the plunger and a case. The air hoists, on the other hand, are equipped with a high-powered and efficient air motor which is geared through a mechanical train to a hoisting drum.

The throttle graduation on the new hoists is very fine and this ensures instant and complete control of the hoist at any speed and contributes to the excellent operating performance. A safety stop lever is provided which closes the throttle and stops the motor whenever the load by chance is raised to the top of the hoist lift.

The automatic brake is a new and

valuable feature as it holds the load at any desired position for any length of time, regardless of air pressure. The brake consists of a disc attached to the motor shaft, and of a brake plunger with a friction face, which is held in contact with the disc by springs whenever the hoist is not operating, i.e., whenever the air supply to the motor is cut off either by throttling or otherwise. It is entirely automatic in its action and requires no attention from the operator.

The lubrication of all parts has been thoroughly provided for. The motor and gears are both inclosed. The motor operates in a bath of oil and the gears turn in a heavy grease. Oil passages lead to all bearings.

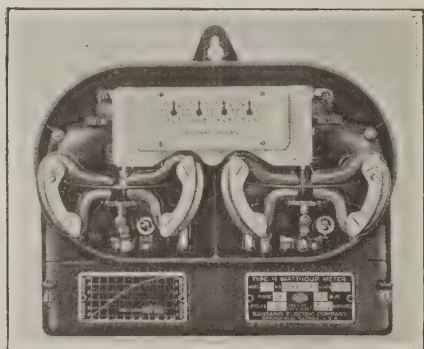
Ball bearings or bronze bushings are provided at all points where experience has indicated they will add to the efficiency or life of the hoist.

These hoists are capable of standing up remarkably well under hard service. If a hoist be overloaded it is only necessary to remove the overload, after which the hoist will start up and work again as well as ever.

A roller bearing mono-rail trolley or top hook mounting can be provided as desired. The trolley mounting reduces considerably the head room necessary for installing. Further, because of its rigidity, which enables an operator easily to start a loaded hoist along a runway, it proves more satisfactory than hooking into a separate trolley unit.

## Watt-hour Meter Supplied with Power-Factor Curve

Increasing interest in volt-ampere measurements and power-factor analysis under operating conditions led to



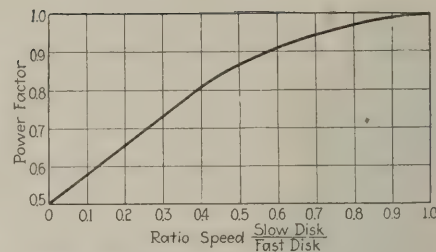
View with Cover Removed

Independent element construction affords a means for determining the power-factor of a load, simplifies meter calibration, and reduces repair part stocks.

the development of a new type poly-phase watt-hour meter by the Sanyo Electric Co. of Springfield, Ill.

The meter has two completely independent single-phase elements, placed side by side instead of one above the other, and geared to a differential train that totalizes on a single register the algebraic sum of the energy measurements of the two elements.

By noting the number of revolutions made by each of the two disks during a definite interval of time the power-factor readily can be determined from



Power-Factor Chart Mounted on Case

Assume one element makes 4 revolutions while the other makes 10. Find the ratio between these (0.4) on the base line, move upward to intersection with the curve then to the left and the reading shows a power factor of 0.8 or 80 per cent.

for calibrating the familiar type of polyphase meter.

In this new meter all constructional details except the base, case and register are identically the same as in the single-phase meters which the company has been making for a number of years.

## Heat Exchanger Is Compact And Leakproof

A novel design of heat exchanger for the efficient interchange of heat between liquids is shown in the accompanying illustration.

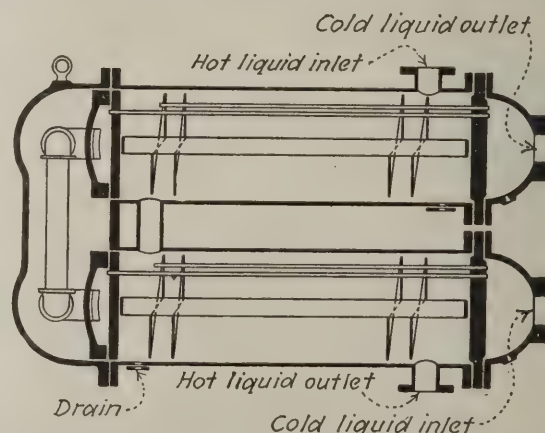
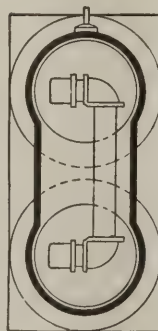
By using two short exchangers connected by a flexible bend and shell cover, a compact, rugged, readily portable, and easily installed unit is obtained, approximately half the length of a single unit designed for equivalent duty. This twin arrangement divides the tubes and shell expansion parts into two units, and makes inspection and cleaning much easier.

In this exchanger, the cooling liquid and the fluid to be heated flow in opposite directions in order to provide the most efficient exchange of heat. Two styles of baffles are used to guide the liquid around the tubes, the selection depending upon the loss of pressure in the shell that conditions will permit. To simplify piping all connections are at the same end. Floating heads and head covers eliminate the strain on tube heads and prevent danger of cracked tube plates. This heat exchanger is manufactured by Griscom-Russell Co., 90 West St., New York.

a graph mounted near the name plate on the box cover. All that is necessary is to divide the number of revolutions made by the slower moving disk by the number of revolutions made by the other disk. The graph or curve then can be used to convert this quotient into power-factor.

### METER ELEMENTS ARE INDEPENDENT

Electrically and mechanically the two meter elements are entirely independent and each may be calibrated exactly like a single-phase meter and adjusted without reference to the other. It is claimed that this requires less time and equipment than ordinarily necessary.



### Twin-Unit Heat Exchanger Easily Takes Stresses

High working pressures can be used because of the design of the parts; all stresses are counterbalanced. Baffles cause the liquids to pass in opposite directions and efficiently transfer heat.



# COAL AGE

McGraw-Hill Company, Inc.  
JAMES H. MCGRAW, *President*  
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Devoted to the Operating, Technical and Business  
Problems of the Coal-Mining Industry

R. DAWSON HALL  
*Engineering Editor*

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## A Post-Graduate Course

PHYSICIANS and surgeons who desire to progress take supplementary courses to keep up with the times. In the coal industry, the technical press and in a minor degree travel from mine to mine, even from country to country, is relied on for a similar result. Many find a further opportunity in attending institutes. The Coal Mining Institute of America holds its post-graduate course this coming week. Let us hope it will be well attended. It is a clinic to which we go not as patients but as doctors of mining engineering. He who would advance cannot safely overlook such an opportunity. It is a waste of valuable time to stay at home when industrial experiences are being exchanged.

## Twenty-five Years Without a Fatality

VIEW it as you please, the Gay record for safety recorded in this issue is remarkable. A quarter century without a fatality yet producing an average of 100,000 tons a year! Of course, as some will say, the roof is good, but it wouldn't be safe without careful watching, and concentrated mining makes such close supervision possible. The roof is only one of the occasions of accident, even though the most important, and the Gay Coal & Coke Co. has avoided accidents from these other causes also. It has also regular and easy grades, and these are in its favor. Still there is no way of belittling the record. It stands as an unusual achievement.

As said, Gay methods of mining make a complete control of operations easy. Strategic points within the workings are connected to each other and to the surface thus affording direct communication between officials. But the men at the mine can claim much of the credit. They have given continuous and hearty co-operation. Their steady work and fair treatment have inspired loyalty.

More than ordinary care has been taken to choose the best men to occupy responsible positions. No man is allowed to run a locomotive unless he has first served time as a trip rider, and he must be qualified otherwise. Only motormen on regular duty are allowed to operate locomotives. The promiscuous running of locomotives during the night shift by any man who happens to be on the job is not permitted. Only 250 volts is used on the trolley lines. The timbering is done by company men and done systematically and when needed. That is a detail that makes for safety.

Equipment of all kinds is kept in excellent repair. Locomotives and other rolling stock as well as all portable machines are frequently inspected, and any defects found are corrected on off-shifts. Mine track is kept in shape religiously. Wiring and other miscellaneous details are maintained in condition

meticulously. Here good engineering practice has counted. It has not increased costs; it has diminished them and decreased accident.

It would be difficult to find such a chronicle if you searched the records of operations under the blue sky where darkness does not interpose its dangers. The Gay mine affords a record for all the world.

## Are Mines So Unhealthful?

WITH a number of useful illustrations Mr. Harrington in this issue vindicates his statement that our mines are not as sanitary and healthful as they well might be. Before accepting his statement, however, we would like to know somewhat more clearly where his facts were obtained. In the West are a number of so-called "lungers" who have gone to a dry climate to enable their weakened organs of respiration to recover from disease. If these men are miners or enter the mines on reaching the West it would not be surprising if they made a bad showing.

His attack on the use made of statistics, American and British, especially British, is not without justification. It is true that miners whose physique is below the average leave the mines and so increase the mortality rate of non-miners. Those who have drawn conclusions from data attainable are mostly men who have no opportunity to make original inquiries to ascertain the life history of several thousand men and draw from these data a more definite understanding of actual conditions. And indeed if they should do so their inquiries would be of only partial value, for local conditions would not afford a conspectus of the whole industry.

The coal dust in one region might be worse than in another as to density, fineness and sharpness. So let us not with Mr. Harrington term the men "sheep like" who draw such conclusions and make such statements. They merely do their best to obtain conclusions from inadequate statistics. Alas that statistics are so inadequate! After all, Mr. Harrington has drawn some conclusions from imperfect figures. How does he know, we would ask, that the farmers and shopkeepers in the cases he instances were formerly miners? How does he know that the miners whom he found suffering from tuberculosis were free of it when they entered the mines? It may be so, but we doubt if he has statistics to show it.

The industry, we feel certain will please Mr. Harrington in the zeal with which it will wet down the coal. But his assurance that the West has led the way in this regard would be disputed by Milton H. Fies, vice-president in charge of the de Bardeleben Coal Co., of Alabama, who gives credit to that state for first wetting down cutter bars. Alabama has gone ahead energetically in this direction.

It is certain that room faces should be better venti-



lated for safety from gas as well as a defense against dust, oxygen depletion, carbon monoxide, nitrous oxides, and hydric sulphide fumes and as a means of stimulating production. Consequently Mr. Harrington has done a service in advocating it.

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### We Could Do That Ourselves

MANY backward nations have been taken in tow by those that were more progressive and these parental governments have introduced measures resulting in the increased comfort and greater well-being of those whose freedom and self-control were thus restricted. In almost every case the subject nation arrives at a point when it asks, Could not we by adopting the methods of the nation which rules us attain the results that it has achieved? Could we not take back our freedom and run our own affairs? Could not we ourselves do what they are doing for us?

The coal industry is in a like position. For many years it was backward in solving its power problems. Antiquated equipment was all the mines had. They had to burn their good coal to raise steam. They used steam hoists. They wasted power. They had an ill-regulated load. The night duty was almost nil; the day duty was heavy. Bad water levied continuous toll. The mechanical and electrical engineers—where there were any—complained bitterly, pointing out that if such inferior equipment was provided no good results could be obtained, but they were not heard.

The rulers of the mines were mining men; they had little interest in mechanical and electrical details. They spurned advice. They wanted power; and the engineers, who were required to provide it, must supply it cheaply and give it when and where it was needed. Why, the electrical engineers were asked, should they try to regulate the mine in the interest of their own inefficiency? Why demand that pumping be made a night duty? Why talk of smoothing out peaks? Why call for electric hoists when steam would do the work?

This went on till the companies gave up their suzerainty to the public utilities, which promptly put the mines under a regimentation which suited their own advantage. The companies, to save money, began to smooth out their load curves. They watched the meters that the power corporations had installed for the purpose of keeping jealous guard of the coal companies' misdoings. Thus the companies reformed and now they are asking, as all liegemen ultimately do, Why could we not do that ourselves? Why do we have to listen to these outsiders? If we had but heeded the advice of our own mechanical and electrical experts we would be producing our own power today.

So perhaps operators will get down to the business of manufacturing their own power, making mechanical and electrical matters—or electrical and mechanical matters, at your pleasure—their own especial interest. The consolidations of coal companies are making possible large power plants with the economies that go with them, and perhaps we shall herald another era when the power consumed at the mines will in general be produced there. The control of the power companies, however, will have been good for the coal industry. In some cases the electrical or mechanical engineer will be placed in charge instead of in duress. We are waiting to find out if that is what is going to happen. But while there is a doubt, perhaps it would be well for the mining engineer to brush up on his electricity.

He might find himself laid on the shelf otherwise. In any event he should know enough to handle economically the power that his company is purchasing.

E. J. Gealy's story of Illinois shows that in that state the coal companies have not laid down supinely and put into the hands of others an important part of a business that they should have undertaken themselves. It may be that in Illinois engineers have seen their duty more clearly than elsewhere and sold to the operator the value of installing proper equipment for power generation and the need for regulating the use of power so as not to overload plant or transmission lines.

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### Better than Rock Dust?

WHEN Professor Wheeler was here he assured us that Great Britain was looking for something better than rock dust, but was so well satisfied with it despite its faults that it was prescribed in that country for all dry mines and would probably be required even in those that were naturally wet. Since that time Great Britain has required the use of inert dust in all mines producing bituminous coal.

The only substitutes proposed are salts, soaps and oil. None of these are without their objections, and for the present the dictum still seems to favor incombustible dusts. Every cure will lose its efficiency if not applied frequently, provided more coal dust is deposited, and probably all the substitutes have the disadvantage that in time even without deposition of dust they will lose part or all their efficacy.

So it would seem wise to adopt the method to hand promptly. Certainly no mine will do well to solve the problem by doing nothing. Winter approaches with its menace, and the mine which has made provision of no kind or has provided only for the moistening of the air current will have shown the worst of judgment as a single explosion will abundantly prove.

Many suggestions can be made as to the varying recommendations of experts, but cast your mind backward. The electrical engineers years ago advocated direct-current generators. These machines served that generation well. They justified in a degree the judgment of the electrical engineers; but eventually alternating currents with substations and motor-generator sets and rotary converters took the place of the direct-current generator. The pump men advocated reciprocating pumps and they still have their part to play, but after a while the centrifugal pump proved best for large volumes of water and reasonably high lifts especially for discontinuous service, and the mining public recognized their advantages; thus many have been installed.

If we wait for the final pumping solution our mines will be drowned out. If we delay for the last word in electrical practice our haulage problem will bankrupt us. If we linger till the final judgment is rendered on immunization of our mines from dust explosions our heading and mine faces may be strewn with the victims of our dilatoriness. Consequently it is well to prepare at once to rock dust our mines lest retribution, dire retribution, follow. Who will dare defend himself if his mine blows up, and he is found still waiting for the decision on the best practice that the year 1950 or 2000 may make? We have our 1924 problems. Let us use the only available decision, that of 1924 and preceding years. That is not to say that experts should not study the value and possibilities of substitutes and give the problem the benefit of their careful thought.





*Gobbing a Parting by Machinery*

## With Slabbing System and One Machine Loader Gay Handles 250 Tons of Coal in 8 Hours

Wide Pillars Between Room Pairs Slabbed on Both Sides Concurrently—Mechanical Loader Increases Output per Face Employee 40 Per Cent—Parting from Eight to Twenty Inches Thick Removed by Arcwall Machine

BY ALPHONSE F. BROSKY  
Assistant Editor, *Coal Age*,  
Pittsburgh, Pa.

ON THIS DAY of national thanksgiving the Gay Coal & Coke Co., of Logan County, West Virginia, celebrates its twentieth anniversary as a coal producer. Through this score of years it has mined over 2,500,000 tons of coal, without a single fatal accident.

The State Department of Mines of West Virginia cites this record with justifiable pride. By merit of it the company enjoys the lowest compensation rate that the state law allows. Such a record is well worthy of note, especially as it comes as the result largely of a carefully planned method of operation.

Shortly after the Gay mine was opened, or to be exact, in January of 1905, the management began a series of experiments in mining methods, all of which were based on the principle of longwall operation. These tests developed new safety measures and established the conviction that thick beds of coal can be operated successfully by longwall, even when found under fairly heavy cover. Incidentally, they disclosed the fact that coal can be produced in some beds by a modified longwall system at a lower cost than by room-and-pillar methods, even though the roof neither bends nor breaks freely. Evidence of lower cost is found in continuity of operation, for in the score of years that this mine has been worked it never has been shut down, either by reason of a strike or from any other cause. In weighing this fact, also, it must be remembered that the mines of Logan County have not always enjoyed the economic advantages which they now possess.

At first an attempt was made to produce coal from a continuously retreating longwall face. This system, however, failed chiefly because the roof could not be controlled. From this experience the single-room system

was devised, in which a modification of longwall mining was attained by widening the rooms. Many of the details of this system have undergone alterations, and the plan now employed is the result.

### SPECIFIC CONDITIONS FIX ROOM PROPORTIONS

Up until 1915 rooms were driven 10 to 12 ft. wide and 285 to 300 ft. long on 100- to 120-ft. centers. These dimensions were not arbitrary, but specific conditions dictated their exact proportions. The rooms were then mined, one at a time, either advancing or retreating, to a width of 80 to 90 ft. This was done by slabbing the blocks between rooms in longwall fashion, leaving pillars up to 30 ft. wide for roof support. No attempt was made to recover these narrow pillars, and their presence in the abandoned section assured the success of the system, because directly above the coal lies a 30-ft. bed of strong sandy slate which caves with difficulty even in wide spans.

In driving these single rooms sufficient air could not be carried to the faces, consequently crosscuts were driven between adjoining rooms after these had progressed for half their length. Brattices were also used to facilitate ventilation. The inadequacy of the ventilating system and the expense of driving rooms in this manner led to the adoption of the double-room system.

No. 1 main heading (see Fig. 5) from which the old section of the mine was developed, consists of two entries, whereas the No. 2 main, which serves the sections now being worked, has three entries. These are protected by 100-ft. pillars and driven in a southwesterly direction up the pitch, the grade of which is  $1\frac{1}{2}$  per cent. Butt entries are accordingly driven level, except



for local dips in the coal measure. This arrangement gives grades favoring the loaded cars.

Where the coal is clean, main and butt entries are driven 15 ft. wide with 40-ft. chain pillars between them. In the sections of the mine now being worked most vigorously, a soft-shale parting, sometimes as much as 20 in. thick, divides the bed into two benches. This makes it necessary to drive the headings 18 ft. wide instead of 15 ft., the additional width being needed for the storage of the refuse, none of which is taken out of the mine. In like manner the thickness of this shale band governs the initial width of the rooms.

In the double-room system, the butt entries are driven at such intervals as will leave a panel 350 ft. wide between them. Pairs of rooms are then driven on 185-ft. centers so as to divide the panel into blocks 135 ft. wide and 350 ft. long. Each room of a pair is driven 15 to 18 ft. wide on 35-ft. centers. These dimensions are shown in Fig. 1, which indicates the plan by which the double-room system is operated.

Driving the rooms in pairs instead of singly and dividing the panels between the butt entries into blocks serves two purposes. Not only does it facilitate ventilation in this narrow work, but it also allows the intervening blocks to be mined from both sides simultaneously. This is accomplished by successive slab cuts advanced toward each other and toward the center line of a block, as shown in Fig. 1.

#### CHAIN PILLARS AND SLABBED BLOCKS LEFT IN

In order to protect the butt-entry haulage roads, especially when the system is worked advancing, these slab cuts which average 300 ft. in length are gradually

shortened as they approach the center line of the block. This leaves a somewhat triangular stump which is recovered in retreat.

The percentage of unmined coal left when an area is abandoned depends entirely upon the conditions. Chain pillars between rooms are never recovered. Though an attempt is made to mine out the coal in the blocks between room pairs, as in block 2 of Fig. 1, the roof sometimes shows signs of breaking near either or both of the approaching faces as the pillar between them becomes narrow. In this event the pillar is abandoned as is shown in block 3 of Fig. 1. The average recovery of coal for the entire mine is about 80 per cent, which compares favorably with that attained throughout the Logan field.

Track of 32-in. gage is laid parallel to the face and at a distance from it of 5 ft. If the roof shows no weakness the first row of timbers is placed 15 ft. from the pillar. Under weak roof and during the last few cuts finishing a block, this distance is shortened to 11 ft. The average, therefore, is about 13 ft. This measurement is, of course, the average span of unsupported roof along faces before they are cut. Consequently, depending upon roof conditions, the maximum unsupported span in front of a newly cut face including the depth of the machine cut varies from 17 to 21 ft., giving an average of 19 ft. The arrangement of a face may be seen in block 4 of Fig. 1.

Posts of an average diameter of 8 in. are placed on 10-ft. centers, in rows 6 ft. apart. No attempt is made to recover them; in fact their presence for some distance in the rear of the face retards any subsidence of the roof, and so prevents the coal face from being subjected to squeeze. It should be remembered also that the

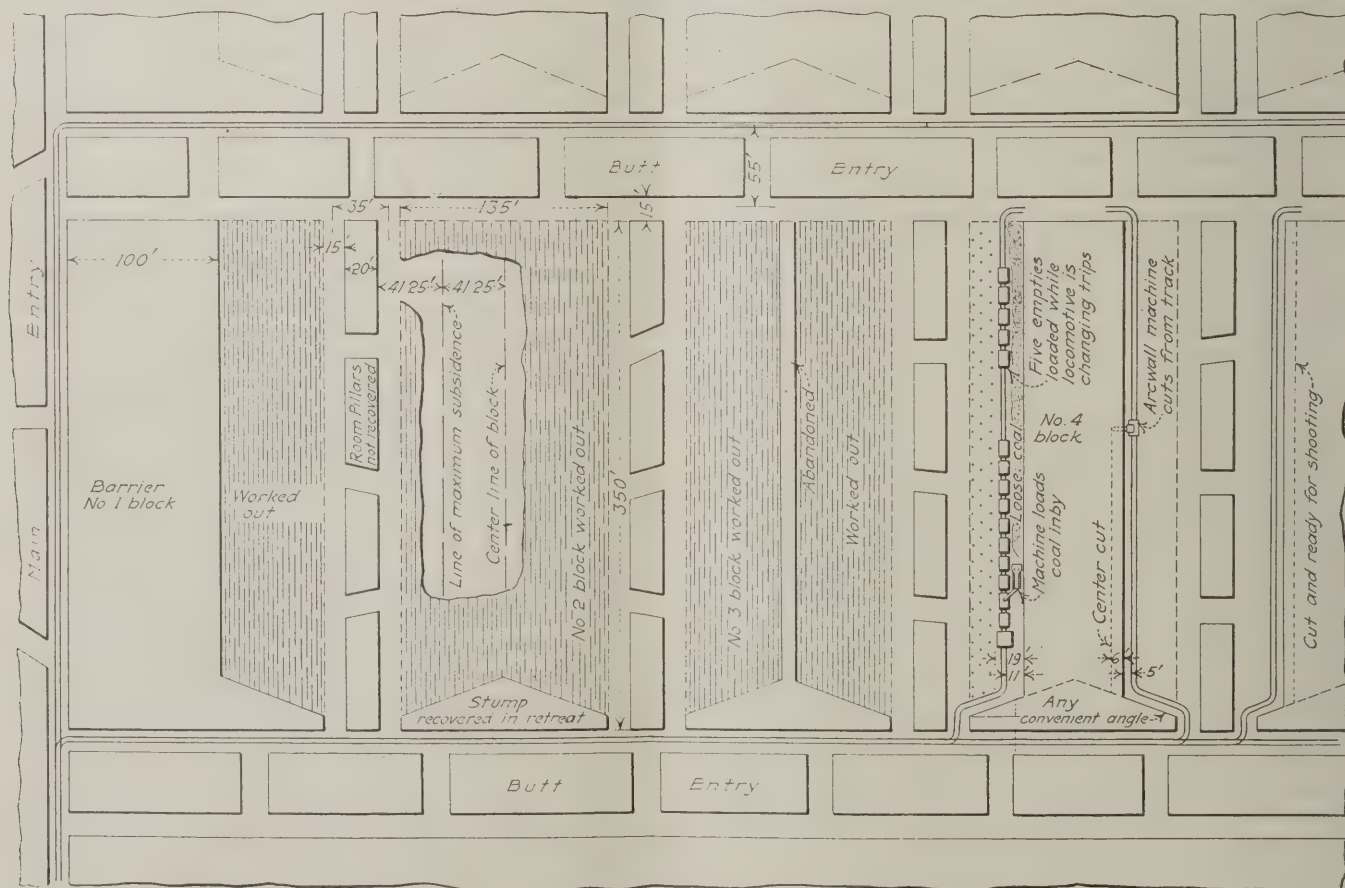


Fig. 1—Double-Room System of Modified Longwall Advancing Used in Gay Mine

Rooms are driven in pairs with a 20-ft. pillar between them which is never recovered. It helps to support the roof while the wide pillars on either side are being removed. These pillars are slabbled from opposite sides, successive cuts advancing toward each other. The faces are center cut, and the two benches drilled by machines on the face track. The coal is loaded mechanically.





FIG. 2

**Cutting Face**

A heavy shale parting in the middle of the bed is removed by one, two or three cuts of an arcwall machine operated from a face track. This enables the machine to cut to a uniform depth and move rapidly along the face.

blocks are mined at a rapid rate and that the roof is sound. That is why the posts are capable of serving the purpose described. As a rule, the initial set of the roof is not appreciable. Even though the timbers might be recovered with safety, the procedure would be hampered greatly by the refuse from the cutting machine that is piled between them, the machine making its cuts in the soft-shale parting. When clean coal is mined by this system and the roof will permit, many of the posts can be recovered.

Over fairly long spans the roof is self-supporting to the extent that it will not come down for a long time after the coal has been removed, nevertheless there would be more or less bending of the roof strata immediately above the coal were timbers not employed. This bending or subsidence becomes greatest along a line midway between the center of a block and an adjacent room pillar, as indicated in block 2 of Fig. 1.

As this point of ultimate maximum subsidence is approached by the working face, either the diameter of the posts or their number is gradually increased. Conversely as the working face recedes from this line, either the diameter of the timbers or their number is gradually diminished. This practice is not necessary in mining all blocks, but is followed where the roof in the early stages of block extraction exhibits a tendency to bend. The same reason that dictates this practice also forbids recovery of the timbers and of the narrow room pillars. It is adopted in order to avert or delay the occurrence of a local squeeze.

**ACRE AND A QUARTER STANDS FOR MONTHS**

In one section of this operation a mined-out area having a width of 136 ft. and a length of 400 ft. has been standing for months, without the surrounding coal being apparently affected adversely. The first experiment with a system of retreating longwall on a 300-ft. front, in which the face was mined for a distance of 120 ft. without causing a roof fall, proved that in the use of any modification of this system, under the conditions that exist in the Gay mine, squeezes can be avoided only by leaving pillars at given intervals. Whether the thickness of the cover above the bed is 500 or 1,000 ft., the chain pillar between each pair of rooms serves its purpose with almost equal effectiveness.

Extensive falls of roof, of course, occur in many parts of this mine, although in most instances the lapse of an appreciable interval is required for this action to take place. Such falls give ample warning. The timbers take weight gradually, cracking or brooming as much as 6 in. before they break. Diligence must be exercised in

the supervision of the last few cuts that complete the mining of a block. One of the two approaching faces is abandoned and the track removed. This permits greater concentration of effort along the face being worked and a quicker-withdrawal at the first sign of danger.

**MATCH STICKS GIVE WARNING OF MOVEMENT**

On off shifts during this stage of the work no mine cars or machines are left along a working face, but timbers are set closer and the roof is watched with extreme care. Mud seams in the roof are dangerous, particularly if they occur near the center line of the block being mined. Cracks are observed periodically for any increase in their width or the advance of one side beyond the other. Slight movement between the two sides may be detected by the falling of small sticks, such as match stems that have been inserted in the crack.

It is manifest that a greater concentration of work for a given area can be attained in the double-room system than in the single-room. Aside from increased concentration, however, this method affords greater safety. Inasmuch as each block is mined from both sides, the time of extraction is only one-half that necessary with the single-room system, and the distance that each face must be advanced to complete the mining is correspondingly less. As a result the roof has less time in which to act before the block is mined out, and should it show signs of weighting its leverage is of less magnitude.

The success of this system is dependent entirely upon concentration and quick recovery, together with the leaving of narrow pillars at given intervals to support the roof until 80 per cent of the coal in any particular area has been removed. The advantage of leaving pillars to support the roof while the coal between them is being worked out is most readily discernible in the room-and-pillar system. If, however, these pillars are not recovered in second mining their presence in the goaf, according to the usually accepted theory, tends to create squeezes. This is particularly true if such pillars are not of sufficient size or number to support rigidly the overlying strata throughout a long period of time.

From the observations of mining men over a term of years, it has been proved that the larger the percentage of recovery, the fewer are the squeezes incurred, other conditions being similar. In the Gay mine, squeezes, when they occur, manifest themselves only on the narrow pillars in the abandoned workings and generally do not affect the faces being mined. Thus a squeeze developing in block 3 of Fig. 1 either would be completely stopped by the chain of pillars between blocks 3 and 4, or would be greatly retarded by them.



Although there are several conditions in this mine that might be expected to prevent the success of this system, squeezes on the working face are rare. The rigidity of the 30-ft. bed of sandy shale, as well as that of an indeterminate thickness of other strata above the coal, stubbornly resists the force of gravity which otherwise would cause immediate caving or subsidence as soon as the coal was removed.

Despite their apparent inadequacy, the pillars left at given intervals, appear to counteract the force of gravity which tends to bend or break the roof. After a pillar has been abandoned it is capable of "holding its own" throughout a sufficient period of time to enable the mining front to progress beyond the limits of any danger zone that may be established.

#### SHALE BAND CUT OUT BY MINING MACHINE

Quick recovery is highly important. Apparently, 80 per cent of the coal can be drawn from beneath the roof before it has had time to collapse. Before the collapse comes the seat of mining operations has been far removed and is protected by intervening pillars. Chain pillars 40 ft. wide along the butt entries prevent the abandoned panels from squeezing and prevent the squeeze from crossing into an adjoining panel of solid coal. In course of time the roof comes down, thus relieving the pressure and stopping the squeeze.

The clean coal in the Cedar Grove bed (locally known as the Island Creek) which is worked in the Gay mine, attains a thickness of 74 in. A band of soft shale, having an average thickness of 8 in., but sometimes thickening to over 20 in., occurs in the middle of this bed, throughout the sections now being worked. In portions of the bed operated prior to 1915 the coal was practically



Fig. 3—Electric Drill Mounted on a Truck

Mining operations in the Gay mine are highly mechanized. The coal face is drilled by an electric machine mounted on a mine-car truck which moves readily from place to place along the face and is always ready for work.

free of partings, consequently undercutting machines could be employed to advantage. At the present time, a Jeffrey arcwall machine with a 7½-ft. cutterbar removes this shale parting.

Depending upon its thickness, one, two or even three cuts are required to remove this band. A kerf is first made in the top of the band and then widened to the thickness of the parting by one or two additional cuts, the arcwall machine traveling on a track, which is kept 5 ft. from the working face. This distance is accurately maintained in order to keep the depth of cut uniform. The track is laid with 20-lb. rails placed on steel ties

spaced on 2-ft. centers. The light weight of this track permits it to be moved over easily by means of bars to each new position as the face advances. However, in order to provide the necessary rigidity and eliminate trouble in keeping the cutterbar in a correct position, 30-lb. rails are recommended.

A machine runner and his helper can make a double 6-ft. cut along a 300-ft. face in 10 hr., or a triple cut in 16 hr. The best record thus far made by this arcwall machine under the conditions existing, is 1,200 lin.ft. of a single 6-ft. cut in 12 hr. Where the soft-slate band is thicker than the width of one cut and less than two, the second cut is made by traversing the cutting machine.

Four men are necessary to dispose of the "shale bug dust" from a double cut. A 4BU-type Joy loader is used to gather the cuttings from the floor at the face, after the cut has been cleaned out. This machine deposits the refuse on a Jeffrey pit-car loader, because the loading machine is not provided with a swinging conveyor and works with its main axis parallel to the face. The pit-car loader thus serves as an auxiliary conveying unit with its conveyor extending at an angle to the track and discharging the bug dust behind the nearest row of props. This arrangement is clearly shown in the head-piece of this article.

One of the four clean-up men operates the loading machine, two handle the pit-car loader, and the fourth scrapes the bug dust out of the cut in advance of the machine and later on follows after it with a hand shovel, gobbing the material that it has missed. If the arcwall machine has to make three cuts to remove the parting, an additional man, making five in all, is required. Gobbing the bug dust from a cut takes from 5 to 8 hr. depending on the thickness of the parting. Cuttings from an 8-in. band on a 300-ft. face can be cleaned up in 5 hr.

#### TRUCK-MOUNTED DRILL SINKS ALL SHOTHOLES

The shotholes are made by an electric drill. This is mounted on a mine-car truck which travels on the face track as illustrated in Fig. 3. One man does all drilling, another loads and shoots the holes. As a rule about thirty-five holes are drilled in the upper bench of a 300-ft. face and an equal number in the lower one. These holes are started 12 in. from the bottom or top, as the case may be. The bottom holes, which are shot first, are charged with 15 in. of FF black powder. The top holes are charged with 11 in. of the same explosive. Both top and bottom benches are fired with electric blasting caps as prescribed by law. A permissible dynamite is employed for pop-shots.

For many years the management of this mine has been highly interested in labor-saving machinery, and its present methods are the outcome of experience gained during this time. A 5BU-type Joy machine is now employed in coal loading. It handles 240 tons or more in 8 hr. on the day shift. It is also being used on the night shift, in which it loads about 180 tons in less than 8 hr. Less coal is mined in the night than on the day shift because an insufficient number of mine cars are then available for loading. On Sept. 13 last, one month after the machine was installed, it loaded 250 tons of coal on the day shift and 230 tons during the night, making a total of 480 tons in 16 hr. Less than three weeks after its installation, it had loaded 245 tons in one shift. During this shift, however, 1½ hr. were lost in protracted waits



for cars, and  $\frac{1}{2}$  hr. was consumed in moving from one face to another. The time losses mentioned do not include brief periods of idleness occasioned by waiting for trips.

The records above cited were made by inexperienced operators under the supervision of a demonstrator. The



Fig. 4—Coal-Loading Machine at Work

This machine soon displayed its ability to perform the duties for which it was intended. Shortly after installation it loaded out 420 tons of coal in 16 hr., from two long slab cuts. The roof over the working places is strong, neither bending nor breaking freely. For this reason a wide span of unsupported roof is permissible.

management is satisfied if it obtains 200 tons per shift from the loading machine. Judging from results thus far obtained, however, as much as 350 tons per shift from one machine under conditions that prevail in this mine is entirely within the realm of possibility. Before this rate of loading can be attained, however, methods of shooting the coal and handling the mine cars must be adapted to the requirements of the loading machine. Eventually these changes will be made, and the loader will then be given a chance to show what it really can do.

A 6-ft. cut on a 300-ft. face in the 5½-ft. Cedar Grove seam where the coal weighs 83½ lb. per cubic foot in the solid, will yield about 400 tons. Subtracting from this, 50 tons of coal which is loaded by hand, leaves 350 tons for the machine, which is approximately equal to its capacity per shift when satisfactory haulage is provided.

As has been previously stated, a distance of 5 ft. is maintained between the track and an unshot longwall face. This distance is restricted by the inability of the roof to sustain its own weight in an unsupported span longer than the normal 19 ft., or the maximum 21 ft. It is also governed by the requirements of the cutting machine, which operates from the track. Because of the close quarters in which the loading machine must work, it occupies a position with its body parallel to the face and the rear conveyor swung over the track, as shown in Fig. 1.

#### MUST MAKE PLACE IN WHICH TO STAND MACHINE

For general purposes this position of the machine is entirely satisfactory, but it requires hand-loading to clear a space at the front end of the coal pile, in which the machine can take its place to begin operation. No doubt it could clear the required space itself by working from a position across the track, but this would cause a loss of time and some confusion. Consequently, about 25 tons of coal are loaded by hand at the front end of the pile.

Three men—a runner and two helpers—comprise the loading-machine crew. Aside from their work on the machine, the helpers trim the coal cars and tram the empties, when a locomotive is not present. They do no

shoveling. The loading machine cleans up the face and breaks down hanging coal quite effectively. Hand-loaders shovel the coal missed by the loading machine and with their hand picks straighten irregularities along the face. This clean-up yields about 25 tons. The machine crew is paid by the day, and the hand-loaders work by the ton.

Details of the track arrangement are shown in Fig. 1. Straight rails are inserted between curves in the rooms, and short lengths are added to adjust the track whenever it is advanced toward the face. A short length of straight track extends beyond the curve into the aircourse on the inby end of the rooms. This affords storage for several cars in the clear of the loading machine when the latter is working at that end of the room.

A 6-ton reel locomotive is kept in constant attendance on the loading machine. This backs a trip of fifteen cars into a room; five of which on the inby end are cut loose, the locomotive remaining with the other ten while they are being loaded. While the locomotive changes trips the five cars detached from the trip are trammed by the helpers to the loading machine. In all trips other than the first one, the locomotive pulls fifteen loaded cars at a time.

#### LOOP-HAULAGE METHODS MIGHT INCREASE OUTPUT

Although the haulage facilities in this double-room system are vastly superior to those afforded the loading machine in the room-and-pillar method of working, some improvements might be made. In the single-room system of modified longwall mining, as previously used, mine cars moved in a continuous circuit from one butt entry, through the rooms, to the other flanking butt entry. This track arrangement was discarded, however, when the double-room system was adopted. Its application to the present system of mining should increase the output of the loading machine.

Several other changes in the operation of this mine might be introduced with possible advantage. A system of rope haulage that would relieve the locomotive from spotting cars under the loading-machine conveyor might possibly be adopted, but the sharp changes of direction of the track in the room necessary to follow around the entry stumps would interfere with the adoption of any such plan. Any equipment of this kind, however, would necessarily require sufficient power to move a trip of fifteen cars as a unit over grades that in places are against the load.

Room conveyors could not be readily applied to this system under the conditions now existing. This is because of the presence of the shale band in the middle of the bed, which is removed by the arcwall machine. This objection might, however, be obviated by mounting the coal cutter on a caterpillar tractor. In clean coal a longwall machine might be used. In any case, however, the conveyor layout would be complicated by the necessity of getting around the room stumps which are requisite to this system of mining when operated by the advancing method. The room stumps might be eliminated by maintaining a longwall face from butt entry to butt entry, but this change would require that the present system be operated on the retreat.

If a large tonnage were desired from a section, a number of panels between butt entries would be necessary. Room conveyors, aided by a limited length of entry conveyor, would do much to improve transportation in such a layout. They would also render possible



the working of this system in mines having a roof that is weaker than that at this mine, inasmuch as the unsupported span would be shortened to about 12 ft.

As has already been stated, the loading machine does not load out an entire cut in one shift. Each of the other operations at a face, such as cutting, drilling and shooting, is completed in less time than is demanded by the loading machine. As a result, machine-loading in any section must be augmented by hand-loading in order to keep all equipment and crews busy during each shift.

For the first three weeks of its operation, the present

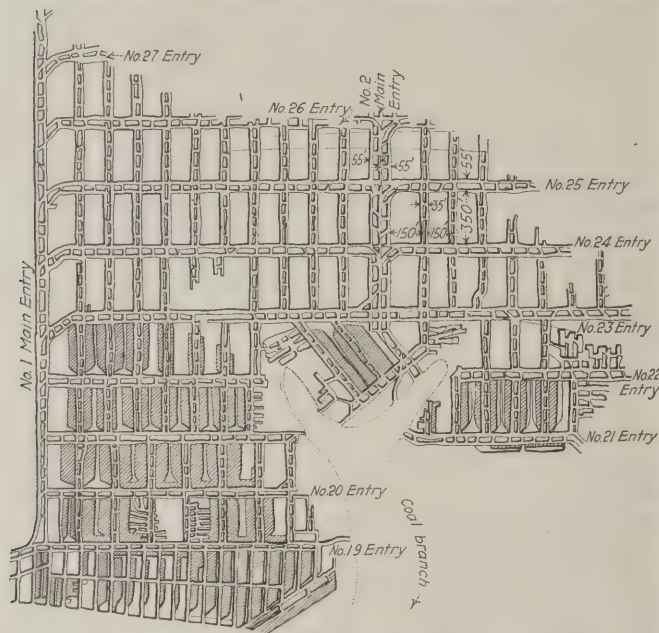


Fig. 5—Map Showing New Section of Gay Mine

Any departure from the system laid out is the result of unusual or unfavorable conditions. Of course, systematic mining is impossible in a tract where the contour lines are irregular. In this mine coal near the outcrop, if recovered at all, is produced by the ordinary room-and-pillar system.

loading machine handled 420 tons in two shifts on full-time days. Needless delays arising from the unfamiliarity of the men with machine operations, occasionally caused the tonnage to fall below this mark. As has been explained, this output is appreciably below a conservative estimate of the machine's capacity in this mine. Nevertheless, the average output per man per shift in the loading-machine section is  $16\frac{1}{2}$  tons, 28 $\frac{1}{2}$  men being required to produce 420 tons of machine-loaded, and 50 tons of hand-loaded coal, making a total of 470 tons in all. The crews and number of men in this section may be listed as follows: Two cutting-machine men, four gobbing-machine men, six loading-machine men (two shifts), one driller, one shotfirer, four haulage men (two shifts), two timber-and-track men, one assistant foreman, and half time for one electrician.

In clean coal, without changes other than the elimination of the four men on the gobbing-machine crew, the output per man per shift in a section of this kind would be 19.2 tons.

Before the introduction of the loading machine, the following men were needed to produce 470 tons of coal when working under similar conditions: Two cutting-machine men, four gobbing-machine men, one driller, one shotfirer, two haulage men, two timber-and-track men, one foreman, one-half time of an electrician, and twenty-six hand-loaders.

A total of 39 $\frac{1}{2}$  men were thus required to produce 470 tons of coal, giving an average of 11.9 tons per man per shift. The twenty-six hand-loaders averaged 18.1 tons per day, which is a comparatively low figure under the conditions existing in this mine. The output per man per day, however, has no direct effect on the cost of mining if loading is done on a tonnage basis. In the Gay mine the best hand-loaders are employed in driving narrow places where a low output per man would seriously affect the cost per ton by requiring more working places for a given development.

The mine here described is an average-size operation, yielding not over 1,000 tons of coal per working day. Less than half this quantity is loaded by one machine, the remainder being loaded by hand. Prior to the installation of this loading machine, the average daily output per man employed, both within the mine and on the surface, was 6 tons. The installation of one coal loader boosted the daily output per man employed at this operation to 7 $\frac{1}{2}$  tons, an increase of 25 per cent.

### Nova Scotia's Bumps Due to Pressure

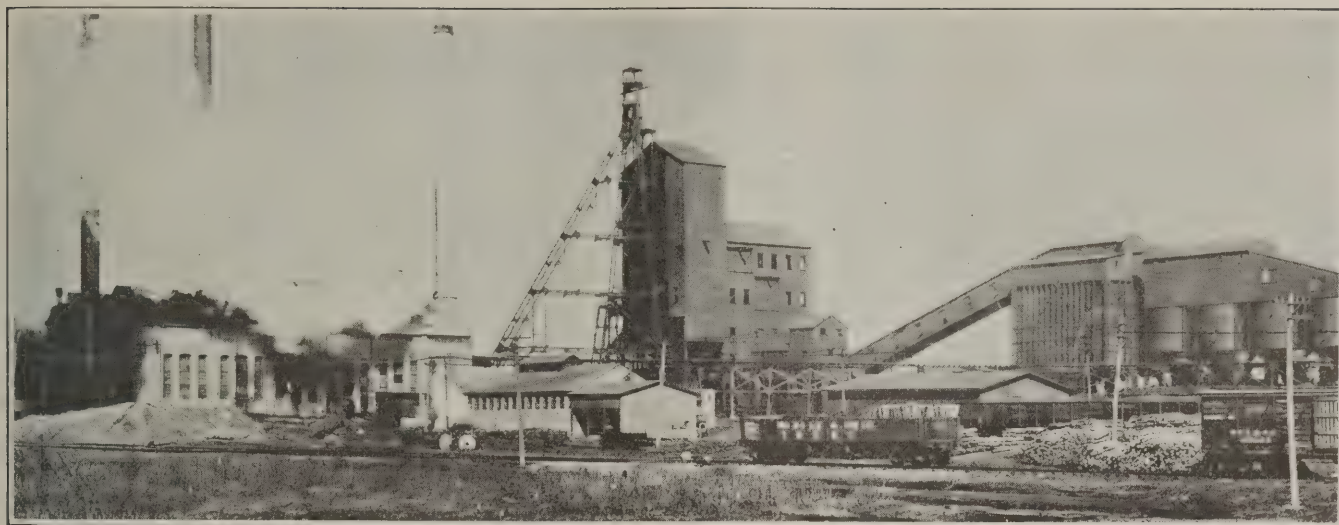
George S. Rice, chief mining engineer of the U. S. Bureau of Mines, is about to complete a report on "bumps" in Nova Scotia mines, for the government of that province, to whom Mr. Rice's services were lent for the purpose. Though Mr. Rice is not in a position to anticipate his report as to specific recommendations being made to meet the difficult situation which has arisen in Nova Scotia, he points out that "bumps" occur almost inevitably in deep mines where the coal seam has its roof and its floor of strong hard rock. "Bumps" in deep metal mines are known as "rock bursts," and are caused principally by the weight of the overburden.

Before going to Nova Scotia, Mr. Rice personally had inspected similar occurrences in the Crows Nest district of British Columbia, in the mines of south Staffordshire in England, in the mines near Mt. Rainier, in the State of Washington, in certain coal mines in Utah and in some of the Pennsylvania anthracite mines.

Mr. Rice declares that there are local variations in the contributing causes of "bumps." In south Staffordshire, for instance, falls of rock masses in worked-out areas above transmit shock through the rock which at times is sufficiently severe to set up air blasts. In the Crows Nest region rock movements set up quakes which are felt more on the surface than in the mine. The greatest danger comes from the sudden bursting of the ribs along mine passageways, or by the instantaneous upheaval of the floor. The remedy in all cases, Mr. Rice states, is found in maintaining pillars broad enough so as to prevent overloading, and, as mining reaches greater depths, in adopting either longwall methods or hydraulic sand filling. Where the mines are not suited to longwall advancing, retreating longwall methods must be used.

Mr. Rice is much impressed with the conduct of mining in Nova Scotia. The mines are well managed and modernly equipped. The average intelligence among the mine workers is high and greatly simplifies meeting the unusual difficulties which surround the winning of coal in that province. The fact that the Government should call into consultation a mining engineer from another country, is indicative, Mr. Rice states, of the broad policy of securing all possible information which may contribute to the solution of its problem.





*One of the Largest Producers in Illinois*

## How Some Companies Took Time by the Forelock This Summer and Are Now Being Repaid

Weak Market Spurs Mining Men to Heroic Efforts—Big Equipment Makes Possible Large Tonnage When Winter Demands Flood Operators—Success Will Depend on Co-ordination of Machinery with Mine Development

BY EDGAR J. GEALY  
Assistant Editor, *Coal Age*  
New York City

**T**O SAY THAT many of the bituminous-coal executives whose mines were forced to lie idle or work only part time, last summer, were unusually busy during that same period sounds like a paradox. Nevertheless, the statement is true for nearly all the officials were working hard trying to obtain coal orders or devise plans whereby they could mine their product cheaper than their competitors.

As a result of various conferences, all-day sessions and wakeful nights most mine officials had come to realize they were in the throes of a real economic struggle. Some companies which had early appreciated the value of modern mining methods and equipment had placed their orders for labor-saving apparatus and were busy installing the new machinery.

In Chicago, George B. Harrington, president of the Chicago, Wilmington & Franklin Coal Co., was busier than ever directing the finishing touches to Orient No. 2 mine, at West Frankfort, Ill. Here the largest mine hoist in the world was being installed by the Nordberg Manufacturing Co. who built the hoist, and the Westinghouse Electric & Manufacturing Co. who made the two 2,200-hp. motors which drive this double-drum winder.

### POWER BILLS ARE TROUBLESOME

F. H. Manley, vice-president of the O'Gara Coal Co., was busy with power bills and new schedules trying to effect every possible economy. He said, "One of the greatest troubles with purchased power is the big minimum charge a coal company must pay when it is idle or working short time. Purchased power versus mine-generated power is a real problem; sometimes you're

glad you have made a decision one way or the other and yet at times you wish you hadn't decided as you did."

At the Peabody Coal Co. office no one was any busier than Carl Lee, electrical engineer. Important things were turning up so fast that he didn't know whether he would be in Sheridan, Wyo., or still be in Chicago at the end of the week. Mr. Lee was working on problems concerning trolley and feeder voltages. At some of his mines he had found that 55 per cent of the electrical energy used was in the form of direct-current and sometimes 30 per cent of the total electrical energy used in all forms was lost in one manner or another.

### ENGINEERING ECONOMICS IS ESSENTIAL

The solution to this problem, he said, depended upon the economic limit to which the loss may be reduced. Copper feeders cost money to buy, install and maintain, and although he hoped to effect every reasonable economy he did not care to have any of his mines operated as copper producers after the coal had been extracted. Mr. Lee said, "The industry needs to use more engineers, but we must not forget the practical side of engineering." By this he meant what I have often contended. We need business engineers, men who understand the economic and investment side of engineering.

The St. Louis operators were by no means idle. W. Kavanaugh, president of the Southern Coal, Coke & Mining Co., had all his men working on plans to reduce mining costs; in fact, his enthusiasm for coal-loading machines was prompting him to make still further improvements in his equipment to meet the particular





**Fig. 1—Modern Mine Power Plant Operated Like a Public Utility Sells Energy to Nearby Town**

This relatively new plant is capable of taking care of all the mine-load and power requirements of the town of Staunton, Ill. Accurate records are maintained of all the processes involved in the burning of fuel, raising of steam and generation of electrical energy. Power costs are always

available to check the efficiency of the plant against that of other modern stations. The night load and day load of the town are carried at a low cost to consumers. An idle plant during the seasons of reduced coal demand eats into the profit of a coal company, but this plant depends

upon the town load to help pay its carrying charges. A shows the exterior of the well-designed building which houses three 750-kva. turbines and the boiler plant. B shows the automatically-operated stokers in the boiler room that keep the furnaces properly supplied.

conditions in his mines. "Slow periods are the times to spend money," he said, "because that is when nearly everybody else lets his property slip backward."

The Consolidated Coal Co. of St. Louis was just completing a transmission line from its new mine power plant, shown in Figs. 1 and 2, to the town of Staunton, Ill. C. L. Moorman, chief engineer, knows that unusual economies in mine power-plant stations can be realized by raising the all-day load factor by adding loads to off-peak periods. Within a short time the municipally-operated power plant at Staunton is to be abandoned, and power supplied from the coal company's generators. This plan, whereby a mining company creates its own market for coal by converting it into electrical energy, provides for a more continuous operation of the mines and at the same time pays the carrying charges on equipment during periods when it would otherwise be idle.

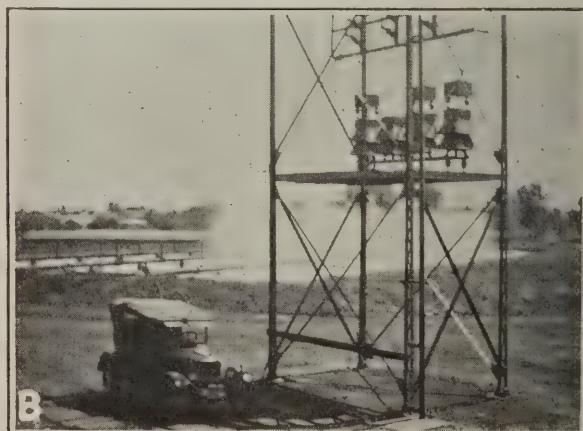
#### MINE POWER PLANTS CONSPICUOUS

One of the outstanding features of the Illinois coal field is the large number of coal-mine power-generating plants and the many novel ways in which the problem of water supply has been handled. High concrete or brick smoke stacks are evident in nearly all sections. Spray ponds, artificial lakes, reservoirs and streams are

closely adjacent to most of the plants. The Superior Coal Co., at Gillespie, has a plant which gets its water supply from two large ponds. "The water is circulated from one to the other and has plenty of opportunity to cool," said D. D. Wilcox, mining engineer. Donk Bros. Coal Co.'s plant near Edwardsville, where W. J. Clark, general superintendent, has his headquarters, is equipped with a spray pond similar to that of the Consolidated Coal Co. near Staunton.

#### LARGE POWER PLANTS NEAR MINES

Arguments often have been put forward that the coal-mining companies cannot generate a large quantity of power near the coal mines. Indeed, this is somewhat amusing when we consider certain aspects of the question. On the Missouri River near St. Louis where there is plenty of water, stands one of the largest power plants in the world. If a nearby coal company had decided to build and operate such a plant as this it would have had to go no further from its mines to locate its plant where it could get sufficient water than the present power company has to go for its coal. However, if the coal company owned the power plant it would then be in the power-selling business, which after all is something for mine operators to consider. It is not a bad industry with which to be connected.



**Fig. 2—Spray Pond Cools Water Used in Consolidated Coal Co.'s Plant near Staunton, Ill.**

Several parallel pipe lines extend over a large pond adjacent to the power plant. Depending upon the load and weather conditions any number of sprays may be put into service. High-voltage distribution lines connect the plant with the mines and surrounding towns. A shows the spray pond arrangement, and B is a picture of one of the switching towers. Lightning arresters protect all lines and power delays are much less frequent than on some systems which extend over large areas



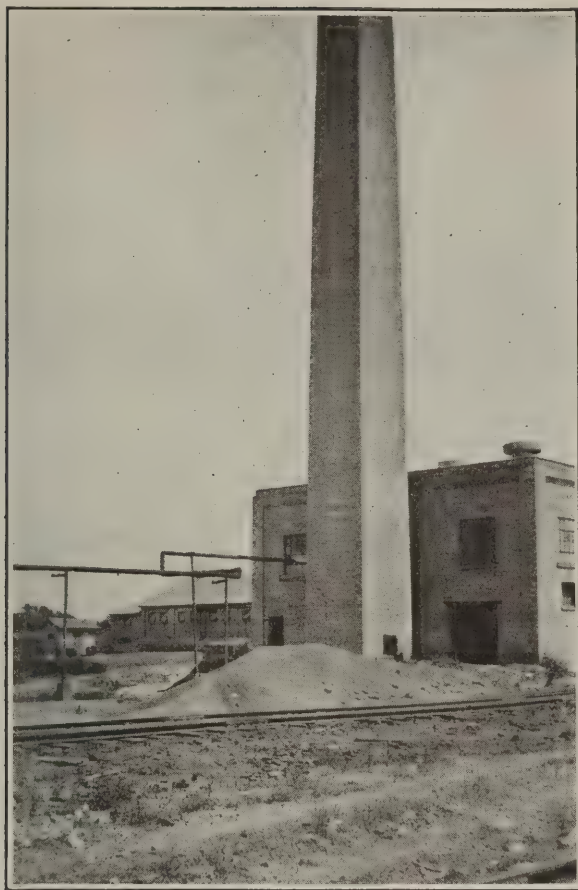


Fig. 3—Large Smoke Stacks Dot the Countryside

This is one of the latest type of stacks built at coal mines in southern Illinois. As one travels through the region it is an easy matter to locate a coal mine, not because of big breaker structures, as in the anthracite region, but because of the numerous concrete and brick smoke stacks. Almost every mine has a power plant.

One's prejudices are again shocked if one thinks a power plant cannot be located near a coal mine, when one stands at the top of the tippie of the O'Gara Coal Co.'s No. 12 mine near Harrisburg, Ill., as shown in Fig. 7, and can almost touch the smoke stack of the coal company's power plant. Here also the Central Illinois Public Service Co.'s smoke stacks are so close that one questions whether they are not part of the same plant. The water used at the public-utility plant is just as near to the coal company's property as to the power company's station.

The concrete tipples, smoke stacks and fans at this mine recently were described by Ralph Brown, general superintendent. The fans are built to last a long time, as evidenced by the illustration, Fig. 8.

#### FORESIGHT BETTER THAN BACKSIGHT

Someone has said, "In time of peace, prepare for war." There's nothing pleasant in this slogan, but there was in the friendly, industrious spirit around the mines of the J. K. Dering Coal Co., near Eldorado, Ill. All the men, from Lee Haskins, general superintendent to the repair men were happily engaged on some job or another perfecting the mining system, installing new generators, repairing locomotives or merely greasing the hoisting cable. Each man was quite sure that the grade of coal was excellent, the mine well developed and sufficient new machinery had been installed during the summer in preparation of the palmy days of winter coal demand.

At no place was mining activity more intense than at West Frankfort. Electrification was being put into thorough operation at the Old Ben Coal Corporation's No. 9 mine. Here one of the largest single-motor mine hoists in the world was being installed. The electrical and mechanical equipment used with this hoist, shown in Fig. 9, consists of a 43,000-lb. flywheel on a motor-

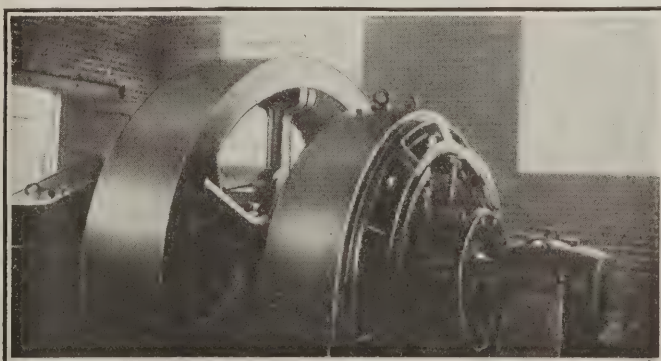


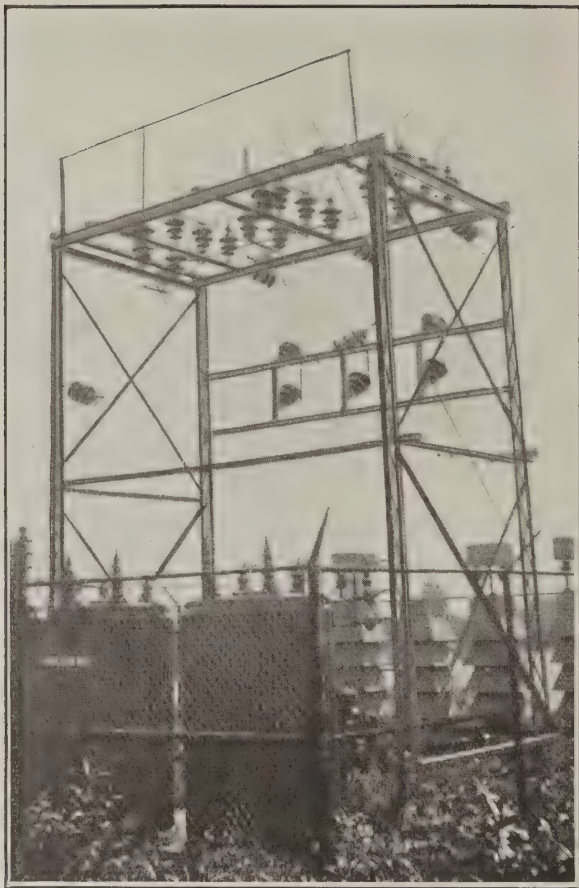
Fig. 4—Additional Labor-Saving Equipment Necessitated this Addition to a Mine Power Plant

During this summer the J. K. Dering Coal Co., added so much new equipment to the mines that it became necessary to install more generating capacity. All the new work on the boiler plant and generator

room was done this summer; now everything is ready for winter. Inside the mines, feeders and trolley circuits have been extended to the new workings. The illustrations show the additions to the

power-plant building, the new boilers and one of the new generators. Ample space was added to the boiler room for more boilers which will be installed when more generating capacity is necessary.





**Fig. 5—Connecting Link Between the Generators And the Machinery at the Coal Face**

From a new power plant, recently completed at the Donk Bros. Coal Co. mine near Edwardsville, Ill., power is transmitted to other mines owned by the company. High voltages are not uncommon in this mining territory. Large quantities of power are now needed at all modern coal-mining plants because of the increased use of machinery.

generator set equipped with a 1,500-kw. generator and a 1,000-hp. motor which supplies energy to a 2,200-hp. direct-current hoist motor made by the General Electric Co. The hoist itself was made by the Nordberg Manufacturing Co. and is a double-drum of cylindro-conical type, the smaller diameter being 7 ft. and the larger diameter 11 ft. All parts are electrically and



**Fig. 6—Well-Equipped Mine Using Its Own Power**

A neat-looking group of coal-mine buildings all made of concrete greets the visitor's eye when he approaches Thermal Mine No. 4 of the Donk Bros. Coal Co. The smoke stack is a typical marker for coal mines in this region. A central warehouse for all the company's supplies and repair parts is one of the most striking features of this place. Accurate record is kept of all materials which pass through the warehouse, and each month, W. J. Clark, the superintendent, gets a report of the operating cost of each machine used around the mine.

mechanically interlocked through relays and gears. A direct-connected 125-hp. alternating-current motor is provided for inching and repair work. Somewhat earlier in the year the Old Ben Company installed several other large hoists at No. 12 and No. 14 mines near



**Fig. 7—Coal, Water and Power Closely Associated**

The stack in the foreground belongs to the O'Gara Coal Co.'s power plant at No. 12 mine. In the background appears one of the largest public-utility plants in southern Illinois. It answers the question: Can large power plants be located near a coal mine? The picture was taken from the top of the mine tippie.



**Fig. 8—Fan with Duplicate Drive, Always Ready to Do Its Work**

This fan is built in a concrete housing and can be driven from either side. In the brick building in the picture is a steam engine which can be placed in service quickly should something happen to the driver located on the other side of the fan.

Christopher, Ill. The complete units, consisting of the hoist, motor and control were designed by the Allis-Chalmers Manufacturing Co. This giant hoist motor and the \$13,000,000 loan just floated are evidences of the permanence and stability of the Old Ben operations.

There is another point of interest near West Frankfort and that is the Orient No. 2 mine of the Chicago, Wilmington & Franklin Coal Co. Here we see that big two-motor double-drum hoist, illustrated in Fig. 10, of which Mr. Harrington is so justly proud. There are no overhead wires around the mine, all conductors are placed in concrete ducts. The repair shop, steam-generating plant, wash-room, etc., are models which indeed show the handiwork of the Stone & Webster Co. and Allen & Garcia.



Joseph Lewis and John Rodenbush, superintendents at this mine, feel sure that the world's record will be broken when they get the new mine properly developed and the equipment well primed.

Illinois, like many other coal-producing states, is rapidly turning to the use of more and better mining equipment. If there is a danger in this great progressive scheme it probably lies in the improper care and correlation of the machinery now being installed. It is sometimes a relatively easy problem to prove, on paper, the efficiency of a given plan or piece of equipment, but it is a different matter to operate important equipment year in and year out and get best results from it. Paper savings and profits cannot materialize without effort. It is folly to purchase and install expensive apparatus and not provide for proper supervision. Many a good machine has failed to produce the desired results because it has never been kept in tune with the ever-changing mine requirements and conditions.

#### LACK OF CO-ORDINATION MEANS FAILURE

A newly electrified machine or mine may work perfectly the first few months after the manufacturer or consultant has left the job, but before long conditions change, not so much through imperfection in machinery but because of lack of co-ordination of salient parts of the system. There is a need, an urgent necessity, for more engineering skill at the coal mines. Our industry has turned to the use of some of the largest types of machines ever made and has installed the equipment with

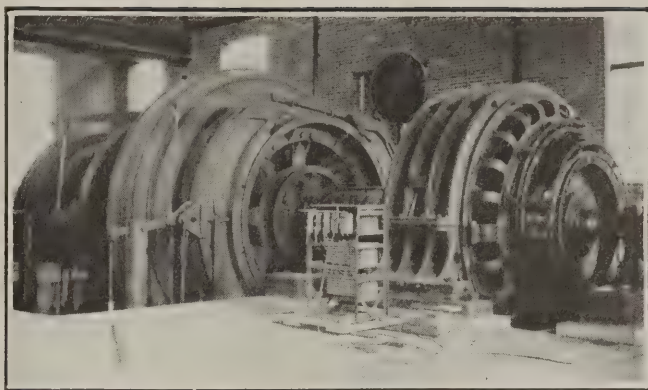


Fig. 10—A Large-Sized Power Plant Is Needed to Drive This Two-Motor Hoist

Two 2,200-hp. direct-current hoist motors, one on each end of the drum shaft are required to run this big hoist. Special connections between the generators of the motor-generator set and the hoist motors made it possible to obtain many of the advantages of high voltage and yet not strain the insulation of the windings.

the expectation that it will always fit changing mine requirements.

One cannot conceive of a large generating plant being operated without high-grade supervision, yet many mining companies have enormous electrical connected loads which just run themselves. The performance of machinery at the mines means financial success or failure today, and in many instances it means life or death to the workmen. It is to be hoped that the mining companies will realize the importance of keeping their equipment well balanced.

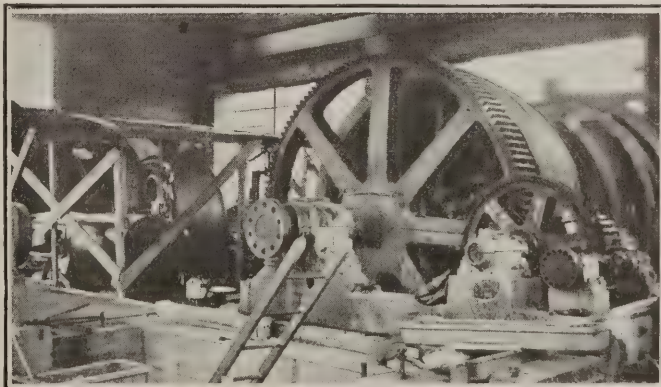


Fig. 9—Parts of One of the Largest Single-Motor Mine Hoists Ever Built

Electricity and electric equipment has been called upon to perform all manner of service in the coal industry. The installation of this new hoist marks the passing of a big steam-driven hoist which has earned its reward. The day these new parts were being put in position the steam hoist was busy shooting out its exhaust

with a bang, bang, bang which seemed to make you feel it was incensed at its successor the electric motor. Yet with each great puff of steam one could hardly help but realize the tremendous waste of energy continually going on. The photographs show the hoist-motor frame in its shipping case, the large 2,200-hp. direct-current

hoist-motor armature, the 43,000-lb. fly-wheel, used on the motor-generator set, and the hoist drum. Note the two half couplings on the hoist mechanism, one is for the regular hoist motor and the other for an auxiliary alternating-current motor used for shaft repair service when slow speeds are required.



## Machine in Royal Mine Makes Dust and Distributes It

Relies on Ventilation to Carry Dust Over Thousand Feet of Space—Dust Barrier Formed at Each Machine Location

By SAMUEL TESCHER

General Superintendent, The Royal Fuel Co., Denver, Colo.

FOR THE PAST six months the Royal Fuel Co., has been experimenting with rock-dusting equipment in its Royal mine at Aguilar, Colo. It now has in operation at this mine a machine that has been found to be highly economical and efficient in the crushing and distribution of rock dust.

As may be seen in the accompanying illustration it consists of a motor, crusher and fan mounted on one shaft. The whole equipment is placed upon a common bedplate which in turn may be mounted on an ordinary mine-car truck. It thus may be taken into the mine and readily moved from place to place. The advantages of this machine are: (1) Low first cost, (2) mobility, and (3) a decrease in the cost of rock dusting through elimination of the expense of collecting, crushing and sacking the material and then taking it underground.

Inasmuch as many mines are located in coal formations that contain shale it will be perceived that this machine affords a real economy. By its use no dust is lost in crushing, grinding or sacking. Neither is there any danger of the dust becoming caked by moisture before being applied.

The machine now in operation crushes and distributes about 2,000 lb. of shale dust per 8-hr. shift. This is ground so fine that about 80 per cent will pass through a 100-mesh screen. The dust is exhausted from the crusher by means of a fan by which it is simultaneously blown into the air current in the mine. It has been found that the dust not only travels in the air but spreads throughout the mine much as smoke does.

At present this machine is being moved over approximately 1,000 ft. intervals throughout the mine. The

deposition of rock dust is, of course, greatest near the machine and so acts as an effective rock barrier. Thus not only is a 1,000-ft. zone of the mine passages rock dusted but an effective barrier is established.

The fan suction acts in such a way that only the finest rock particles are withdrawn from the crusher. Material that is too large to be effective, automatically remains within this machine until ground down to the desired fineness. Tests conducted on an entry show that at a point 150 ft. from the machine all the dust deposited on the surface of the mine workings will pass a 100-mesh screen.

### DUST CLOUD VISIBLE 7,000 FT. FROM MACHINE

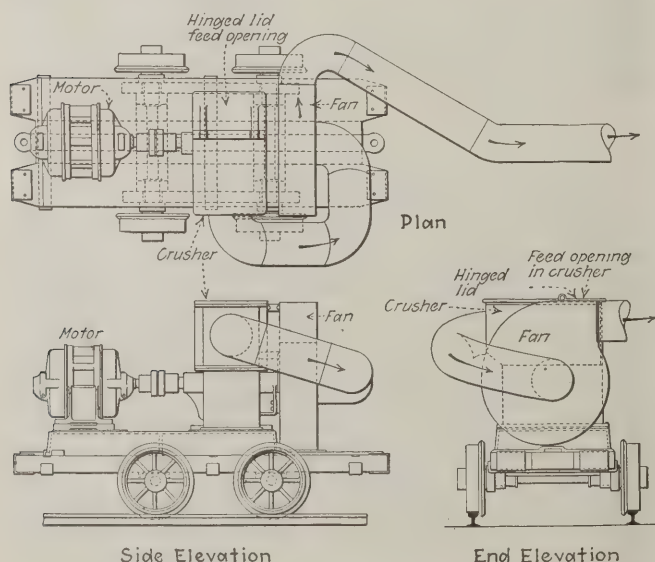
This machine requires only one man for its operation. He feeds the shale into the crusher in approximately 1½-in. pieces. From this point on, the operation is automatic, that is, the machine crushes and blows the dust into the air in one operation. A fine "smoke screen" has actually been observed issuing from the upcast shaft when the machine was located at a point 7,000 ft. from this opening.

By means of this device all the mine workings can be effectively rock-dusted. It has been found that operation of this machine at the mouth of a panel containing fifteen rooms on each entry effectively coated all the roofs, ribs, floors and crosscuts as well as the working faces.

Many mines throughout the country can hardly afford to install an expensive plant for the preparation of rock dust. If, on the other hand, they purchase material already ground, this entails at least the expense of its distribution. In many of these same mines may be found enough shale to answer all purposes if it could be properly pulverized and distributed. Under these conditions such a machine as this would prove highly economical. It can, of course, be moved from place to place throughout the workings and in gaseous operations where it is impractical to station such a machine in the return airway, it may be located in the intake airway and the dust, by means of galvanized iron pipes 6 or 8 in. in diameter, may be conducted through doors or stoppings into the return.

Dust from this machine is distributed in a manner exactly similar to that in which coal dust is deposited. That is, it floats through the air so that particles of coal dust are covered by particles of rock dust of approximately the same size. Tests have demonstrated that this dust travels several hundred feet and finds its way into places that are not directly in the air current.

At the Royal mine the cost of rock dusting has been investigated from all angles. It has been found that this machine makes and distributes rock dust for approximately \$7 less per ton than any other means that has been tried. First cost, as well as maintenance charges, are low and the labor expense after the shale is delivered within the mine consists of the wages of one man only. At the present time the total expense of crushing and applying one ton of shale to the mine surfaces by this method is \$10.50. This includes the cost of mining the shale, hauling it to and into the mine, crushing it, blowing it into the air, moving the machine from place to place, as well as the cost of the electric power consumed in the operation of the machine. All charges have been included in the above figure except the depreciation of the machine itself. Naturally, this item is small. The Hendrie & Bolthoff Mfg. & Supply Co., of Denver, Colo., is agent for this machine.



Grinds Rock and Blows Dust Into the Air

Motor, pulverizer and fan are all mounted on one shaft. The fan withdraws the fine dust from the pulverizer and blows it into the ventilating current. The mine air carries and deposits this inert material exactly as it deposits coal dust. The mine can be effectively rock-dusted by moving the machine through the entries by approximately 1,000-ft. steps. Fine dust may be carried by the air for over a mile.



## Is Coal Industry Blind To Health Hazards Of Mine?



**This Frank Expert Says We, "Sheep-like," Accept Misleading Statistics—Coal Mines "Contribute Far More Than Their Share of Death and Disease"—Rock Dust, Water and Better Ventilation Needed**

BY D. HARRINGTON

Consulting Mining Engineer, Salt Lake City

**C**OAL MINING is pre-eminently no occupation for the physically weak. There are comparatively few underground occupations in our coal mines, except possibly a few provided for pensioners, which do not demand utmost physical strength and endurance. In fact, it is not at all uncommon to hear coal-mine managers state that what is needed in underground workers is that they be "strong in the back and weak in the head," a sentiment with which, however, I am decidedly not in accord.

This demand of the industry for maximum physical fitness is brought about largely by the contracting system of work and tends automatically to eliminate those who in any manner become disabled. While this elimination does not always apply to those partly incapacitated by physical injury (many of whom are in some manner taken care of by the employer), those unfortunates who become weakened by disease are usually forced to leave the mines to go to near-by farms or into some "easy" occupation.

It is largely due to this situation together with the sheep-like acceptance of half-baked statements and misinterpreted statistics, largely of English origin, that there has grown an impression, in fact a positive belief, that coal mining is one of the most healthful of occupations, when as a matter of fact our coal mines contribute far more than their share of disease and of total or partial disability or of death from disease.

Acceptance has been so nearly universal of English and other European statistics as to illness and mortality rates among coal miners that there are available few reliable statistics or tabulated data as to illness and mortality of the coal-miners of the United States. Though there have been a few investigations of these

matters by commissions, the study has usually been superficial and academic. Too often these investigators have based their reports on compilations of available literature largely copied, rather than on information obtained from actual study and observation at the mines. I have had access to some studies, however, which *did*

go into fundamentals, and though I am not able to publish all the data available, some of it will be given in outline.

In a detailed study at one coal-mining locality an effort was made to examine physically about 25 per cent of the men employed, selecting, as far as possible, men who had worked largely or wholly in this particular coal-mining region. It was found that over 30 per cent of those examined had pneumoconiosis, or lung-dust trouble, and practically 30 per cent more were suspected of it or had symptoms of dust trouble. In addition about 90 per cent of those examined had defective teeth.

In a similar study in another coal village in a wholly different region, but also in the United States, it was found that over 35 per cent of those examined had definite lung trouble or pneumoconiosis and an additional 25 per cent had definite symptoms of it. Here again it was stated that a large number of men had trouble with their teeth, though the exact figures were not set forth. In both studies about 95 per cent of those examined were less than fifty years of age.

In the first case cited, there were no mining machines used and the dustiness of the air was due almost wholly to picking down the coal and shoveling it into cars. Face workers were the ones with the most definite lung involvement, and the worst cases had had from nine to fifteen years of experience in working in coal mines. In the second case studied, the coal was undercut by

### WHY DAN SPEAKS OUT

**T**HE AUTHOR of this article has a lot of pointed things to say about the health hazards of coal mining. With customary vigor he hauls off and says them. He is not a doctor and doesn't want anybody to think he claims professional medical standing. However, he has spent a number of the long years of his coal-mining experience studying health as well as safety in coal mines in co-operation with several doctors of the United States Public Health Service and with brother engineers of the Bureau of Mines. In many cases he has been in charge of the investigations that were being made. After having a part in more than one hundred such investigations in both coal and metal mines of 25 states he believes some frank words ought to be spoken to this industry. Therefore he speaks out.



short-wall mining machines and those most definitely affected by dust had averaged twenty years work in coal mines though several had definite lung involvements after two years, the men thus quickly affected being for the most part machine runners. It was found, indeed, that machine cutters were by far the most generally affected, with face loaders next in order.

#### WATER ON CUTTING CHAIN PREVENTS DUST

In one coal-mining district in the West, after the mine-village doctor had advised one after another of the machine runners to leave the mine, the company made a study of the situation and found that the dust irritation was so great that the breathing capacity of the machine runners was much limited, and in numerous instances hemorrhages resulted. To prevent this water is used on the cutting chain. It is said that this efficient remedy for "killing" coal-mine dust was used in the Utah district as early as 1913.

I have at hand a large number of instances in which machine runners and other coal-mine workers have been almost wholly incapacitated by breathing coal dust, having the typical shortness of breath of the metal miner afflicted with silicosis. In several cases hemorrhages resulted; and in a few cases, death. It was this health problem in connection with machine runners that aided materially in the ready acceptance by Utah coal operators of the new safety order now in effect requiring use of water on the cutting chain. Though a few Utah machine runners are indifferent to the new system, none are openly antagonistic and by far the greater number enthusiastically favor this use of the water.

After about eight years of more or less continuous study of the effect of dust on health of miners in mines troubled with the dust of coal, limestone, hematite, silica in various forms, shale, etc., I am convinced that though some dusts are more quickly or more definitely dangerous to the health of underground workers than others, nevertheless any dust found in underground air and breathed by workers in large quantities and finely divided form (say less than 1/2,500 in.) is likely ultimately to be harmful. In case of machine runners cutting dry friable coal, the machine runner in some instances has been "put out of commission" in less than three years.

Dustiness tests of coal-mine air at faces that are being undercut in coal by modern electrically driven shortwall mining machines show that when a spray of water is directed against the ingoing side of the cutter chain, the number of particles of dust in the air is only about one-twentieth of that found when water is not used. The quantity of dust in the air when cutting dry is twenty to thirty times as great as that allowed at working faces in South African gold mines.

It has been determined that, at dry coal faces, picking

and shoveling at even a medium rapid rate makes the air ten to thirty times as dusty as it was when the shift started. Much of this dust is later eliminated from the miner's respiratory organs, but it is pretty well established that a large quantity remains, ultimately clogging them enough to prevent them from performing their functions.

Much nonsense has been written about the coal miner's immunity from respiratory disease and about his being able to resist silicosis when engaging in work in metal mines after having worked previously in coal. It was even proposed a few years ago to introduce coal dust into metal mines having known dangerous dust with the idea of neutralizing the dangerous metal-mine dust by coal dust. In present-day slang, "This is all pure bunk."

In one large coal-mining locality in which a study of adult mortality statistics over a period of several years was made, it was found that, *eliminating mine accidents*, over 25 per cent of the miners who died, had death certificates which read "*tuberculosis*," whereas deaths of non-miners from the same cause in that region were only about 7 per cent and but 16 per cent of the deaths of adult females were from tuberculosis. The death rate of miners, non-miners and adult women from influenza was about equal, being around

7 per cent. However, deaths from pneumonia showed miners over 45 per cent, non-miners a little over 28 per cent and adult women a little over 22 per cent.

In this mortality survey, it was shown that, *eliminating deaths from accidents*, the total deaths from respiratory diseases were: Miners 80 per cent, non-miners 43 per cent and adult women 45 per cent. This would seem to establish the fact that in at least this *one* large coal-mining locality the coal miner is not immune to respiratory disease or even to tuberculosis.

The fallacy of the coal miners' immunity from respiratory disease arises from a number of causes. Where coal miners' mortality records are available they usually show at least 25 to 50 per cent of deaths due to accidents. Hence the percentages of remaining causes of death are from one-fourth to one-half or even two-thirds too low to indicate prevalence of disease. For instance, in one coal-mining region a mortality study showed but 4½ per cent of deaths were caused by tuberculosis; but when the deaths from accidents were eliminated and only deaths from so-called natural causes considered, the tuberculosis death rate jumped to over 16 per cent.

#### FARMERS DRAWN FROM MINES DIE OF PHTHISIS

In a certain coal-mining region it is pointed out that the mortality of miners from tuberculosis has been less than among farmers and storekeepers of the same neighborhood. However the facts are that more farmers and storekeepers of that immediate region died of

#### TWO KINDS OF "SH-H-H!" MEN

PEOPLE in the coal mining business keep altogether too quiet about the dangers of mining to suit Dan Harrington, author of this article. Camp doctors "soft pedal" it, he says, because they are either ignorant from not going down and studying underground conditions or else they are afraid they will be blamed for having a bad camp record. Rock-dust advocates "soft-pedal" it, he says, because they think operators will figure that rock dust is as hard on the men's health as coal dust and therefore rock dusting will get a set-back. As a matter of fact, he holds, rock dust should not be put in places where much of it will be stirred up into suspension. It will serve its purpose elsewhere in the mine if water is used around the working places, and thus will add nothing to the miners' health hazard.



the disease than did farmers and storekeepers in other parts of the same state. It appears then, that partly disabled coal miners who had left the mines, probably diseased, and who had gone into farming and store-keeping near the mines were responsible for the high tuberculosis mortality of that territory and that the comparison between the tuberculosis deaths of miners with outside people of the immediate region is not a fair comparison.

#### DATA ON ACTUAL CONDITIONS SUPPRESSED

Another definite reason why the presence of respiratory disease among coal miners has not been generally known is that for one reason or other those who realize the actual situation suppress the data. Those who are most likely to know about the matter are the doctors in the mine villages. Seldom does a coal-mine doctor write his views for publication, generally because he is too busy, frequently because he doesn't know how to do it and often because he is afraid that his standing with the company will be injured if he gives undue publicity to health danger from dust or from other cause.

The mine doctor knows that the coal operator in most parts of this country would much dislike to be compelled to spend the money necessary to preserve the health of his employees as menaced by the presence of dust, though he ought to do it for the benefit of his own purse, as the dust at the face causes much lost time due to sickness, causes many men to leave coal mines when they should be in the prime of life and certainly is a menace as a possible participant in an explosion.

Oddly enough the "soft pedal" is also placed upon the health danger of coal dust by the enthusiasts who advocate rock dusting to prevent explosions. They feel that if it becomes known or realized that fine coal dust in large quantities in mine air is dangerous to health, those mining companies who might use rock dusting would be afraid to do so, knowing that, if coal dust is dangerous to health, then rock dust or a combination of the two would be worse.

#### ROCK DUSTING IN ENTRIES NOT HARMFUL

As a matter of fact, if the rock dusting is confined to well ventilated places such as main air entries or is placed in unventilated places where there are no men, animals, machinery, etc., to stir the fine rock dust into the air, rock dusting of coal mines is perfectly safe as regards health because there should not be, under such conditions, in the air of such places a sufficiently large quantity of finely divided dust to injure the respiratory organs. However, if rock-dusting methods are introduced at or around the working face where air is usually still and if no water is used, the health hazard will undoubtedly be increased.

The obvious remedy is to rock dust well ventilated entries and non-working dead-air places, but around the working face to use water freely. The best plan is to use a water spray on the cutting chains while cutting, to spray faces, ribs, roof, floor and coal piles several times a day, to sprinkle tops of loaded cars before they leave the face and to wet down at least once daily the region of every room neck or entry face for several hundred feet until the rock-dusted region is met.

If both water and dust are used, the water will aid the rock dusting, the rock dusting will aid the sprinkling and both will promote the health of the

workers and the safety of the mine as well as that of the workers.

Respiratory disease under such names as miner's consumption, anthracosis, pneumoconiosis, tuberculosis, miner's asthma, bronchitis, pneumonia, etc. cause, in my opinion, more deaths and far more misery, lost time and other humanitarian and economic losses among our coal miners than do mine explosions, and it appears that dust inhalation—chiefly of coal dust—is mainly responsible. Except in a few mines and in only one state, Utah, where water must be used at the working face, there is little or no effort being made to combat the menace.

#### HEART TROUBLE AND BAD TEETH COMMON

In a mortality study of a large coal-mining region it was found that if accidental deaths were eliminated, the death rate among coal miners from diseases of the heart was about twice as high as the rate for non-miners and four times the rate for adult women. Apparently the intense effort exerted by the contract underground worker is responsible for this.

As previously mentioned, physical examination of miners (and this applies to both coal and metal mining) indicates that at least three out of four of our mine workers have defective teeth. In view of the fact that later-day medical thought assesses many of our present-day ills against defective teeth, mining com-



**This Line Brattice Is a Doubtful Health Safeguard**

If it were tight enough and not open at the bottom it would be a good conductor of clean air clear up to the working face in this room, thus doing its bit to move out gas and a good deal of dust as fast as they floated into the working atmosphere. If brattices are poor the chances are that men at the faces will breathe enough gas into their lungs to reduce their efficiency even if it does not drive them home to lose time both for themselves and their employers.

panies should ascertain and apply the remedy. The frequency with which defective teeth are found among miners would justify most mining companies in employing the partial or full-time services of a competent dentist to give service to miners at nominal rates or free. State mining departments, state and local health bodies, the Federal Government, should conduct a definite widespread campaign as to care of the teeth.

Carbon monoxide poisoning due generally to breathing fumes from explosives—hence due to poor ventilation or to poor blasting methods—causes some death and much illness among miners with more or less permanent ill effect. In some poorly ventilated mines the air at a considerable number of working faces contains from 0.01 per cent to two, three or possibly four times that quantity of carbon monoxide, and workers have up to as much as 30 per cent of their blood put out of com-



mission at least temporarily by having that quantity of blood saturated with carbon monoxide.

Though some workers at least seem to establish a tolerance so that the carbon monoxide they breathe does not appear to have any particular ill effect on them, others have more or less continuous headache, some have acute nausea, others lose appetite and a more or less general result is chronic irritability. The permanent net result is difficult to ascertain, but certainly some time is lost, and if there were no other ill effect than the irritability (which is easily understood after one has had a carbon-monoxide headache) it is certain that it does not pay any mining company to allow this "disease" in its mine.

Probably the best remedy is to have strong currents of fresh air at all times sweeping over and past places where men work and especially places where explosives have been used or where carbon monoxide may be present from any other cause such as a more or less covered mine fire. Use of black powder and fuse, or of dynamite and fuse, or of coal dust or other flammable tamping material, all tend toward formation of carbon monoxide when blasting. Black powder, dynamite, fuse and combustible tamping material should all be eliminated from coal mines and all shots fired electrically using permissible explosive and inert tamping material. Any coal mine which, in this day, allows any kind of blasting during the working shift certainly shows the minimum regard for the health of its workers or the safety of either mine or miners.

#### NITROGEN COMPOUNDS MAY CAUSE INJURY

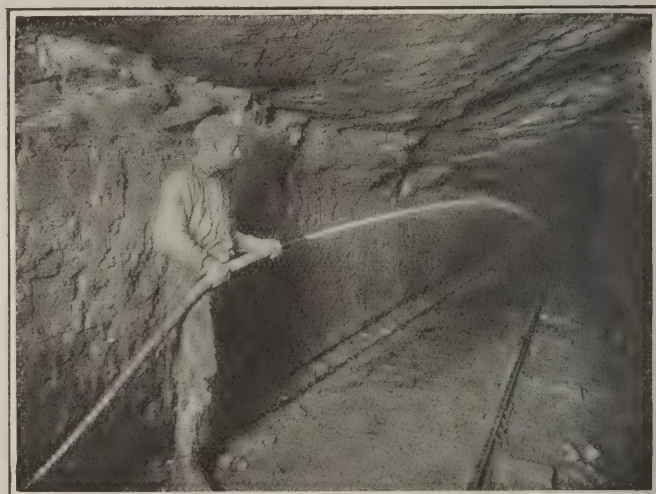
There may also be acute poisoning from oxides of nitrogen released by blasting in poorly ventilated places, though this form of poisoning is much more rare than that from carbon monoxide. The immediate remedy for either is withdrawal to fresh air. If the victim is unconscious give artificial respiration and feed oxygen if available, but of course get the patient to the doctor or hospital as soon as possible. To aid in removal of "powder headache," the breathing of pure oxygen is probably the best remedy, though breathing a combination of oxygen and carbon dioxide in proportion of about 9 parts of oxygen to 1 part of carbon dioxide is held by some authorities to be even better than oxygen alone.

In some non-gaseous mines where ventilation can be, and frequently is, neglected, places are occasionally encountered where the oxygen content of the air will not sustain the flame of a safety lamp. Hence it is below 17 per cent though there may be enough oxygen to feed the flame of a "carbide" lamp which requires only 11 per cent. In such places men have more or less continual headache, they lack vitality and upon making any great exertion they begin to puff and are compelled to slow up. Here again is found irritability. If the air temperature is above 80 deg., as found often in metal mines, though more rarely in coal mines, an oxygen reduction of only one-half of one per cent (from 20.9 to 20.4 per cent or less with a correspondingly slight rise in carbon dioxide) will also give essentially the same symptoms as have been just outlined.

I have no definite data available as to whether there are permanent ill effects from long-continued breathing of depleted atmospheres such as those referred to, though old timers who worked many years ago both in Great Britain and in the anthracite and other mines of the United States, say that much of the so-called miner's

asthma came from long-continued breathing of "poor air" in the poorly ventilated mines of those days. There is absolutely no doubt, that these depleted atmospheres make men slow up in their work and cause them at least temporary ill effects such as headache, irritability, lack of appetite, etc.

Though coal miners in the United States usually have ideal underground working temperatures (from 40 to 65 or 70 deg. F.) some coal mines (and many metal mines) have working temperatures in excess of 80 deg. F. Though there is some doubt as to the permanent ill effects of working in temperatures over 80 deg. I am convinced after much underground experimental work and study of the subject, that long-continued work in underground air with temperatures



**Water Helps Reduce Health Hazard**

Mr. Harrington believes in keeping down coal dust at the faces by using a spray on cutterbars but water should be used frequently also to soak down active rooms and entries leading clear back to the end of the rock-dust zone. If this is done the proportion of fine coal dust in suspension ready to injure the respiratory organs of miners will be small indeed.

above 80 deg. F. is likely to reduce vitality, especially where there is much dust present, or high humidity or lack of movement of air or even slight atmospheric impurity.

#### BELOW BLOOD HEAT AIR MOVEMENT HELPS

Though air movement is of great help when temperature is high, excessive velocities (say over 200 to 300 lin.ft. per minute) hurt rather than aid when the air temperature is above the temperature of the blood (about 98½ deg. F.) though velocities up to 100 or more feet per minute give relief when the air temperature is below 98½ deg. and over 80 deg.

One of the most significant features brought out in a study of effect of high underground air temperature was that a certain quantity of work at a definite rate of working which was quite easy (almost child's play) when air temperature was 70 deg. became more difficult with air at 75 deg., still more difficult at 80 deg., thoroughly hard at 85 deg. and utterly impossible of fulfillment at 90 deg.

In practically all cases the air was nearly saturated with moisture, air velocity was slight or practically nil, the work was done on separate days for each temperature and was performed by the same persons, all of whom were in good physical trim and all of whom experienced essentially the same effect. From this it will readily be seen how essential it is that underground working atmospheres be kept below 90 deg. F. even if



no account is taken of the health feature and nothing is considered except efficiency.

A temporary but acute and at times financially costly disease is found in some wet coal mines where small quantities of hydrogen sulphide issue and attack the eyes of workers. The men's eyes become blood-shot, and get to be so painful that they are forced to spend days, sometimes weeks, in a dark room, and in addition their eyes must be treated by the doctor. The disease is called locally "pink eye" and apparently is not permanently harmful, and fortunately, too, the condition in the mine which leads up to it, is usually temporary as the gas (hydrogen sulphide) disappears after the affected part of the mine is left open for a limited time, also the area affected is generally not large.

While it is claimed that hookworm is prevalent in some of the coal mines in the South, I am not familiar with the situation; however, the almost universal lack of provision in coal mines for removal of human filth, gives the hookworm maximum opportunity to spread provided other conditions such as temperature, humidity, etc. are favorable.

#### COAL-MINE DOCTORS ARE INEFFICIENT

I have had an opportunity to become acquainted with a large number of coal-mine doctors and in general they appear to be, in slang terms, "poor fish" though this is not universal. Only two of these mine doctors that I have met have made it a practice to go underground to see under what conditions those entrusted to their care do their work; as a consequence the coal-mine doctors really know little or nothing about underground conditions, and hence cannot aid in the improving of underground health.

Though a few coal-mine doctors help the Bureau of Mines safety car men in their training of underground employees in first-aid methods, many of them handicap the first-aid instructor because they think he is trying to do doctor's work or seeking to train the employees to do it.

Only rarely does the coal-mine doctor take any definite intelligent action for better mine-village hygiene such as construction or maintenance of sanitary latrines, or the filtering or purifying or safeguarding of the water system, or the giving of health or sanitation lectures or talks. Very few coal-mine doctors endeavor to obtain for the miners washhouse facilities, or insist on their proper maintenance, where they are available. And but few physicians in mining villages know how to treat a man who has been gassed underground.

On one occasion where a number of men were brought out of a coal mine unconscious from coal-mine explosion fumes, a galaxy of coal-mine doctors, assembled from the surrounding country, were helpless as babes as to the proper measures to be taken, and if it hadn't been for intervention of a rank outsider, who did know what to do, several of the gassed men undoubtedly would have died.

It would appear that one of the functions of the coal-mine doctor should be that of preventive hygiene; at any rate he should, at least occasionally, go underground and ascertain how or under what surroundings his patients or prospective patients work. In fact, it would appear that coal-mine doctors should have some more helpful functions than doling out a few pills or setting an occasional broken bone.

One of the most essential factors toward making our coal mines healthful is the consistent periodic physical

examination of all employees. If upon being employed, physical examination were made, the applicants proper sphere of work could be determined with some degree of certainty instead of "going it blind" as is now done. Examination semi-annually or annually would check up the physical condition of each individual, so that steps could be taken in time to help correct defects in individuals as well as to locate underlying causes of trouble.

While I emphatically dissent from the often-repeated statements that coal mining is one of the most healthful of occupations, on the other hand, there is no good reason why it should not be made so. And if by the use of water, precautions are taken against making dust at the face, this can be done readily. If the spreading of dust is checked by the use of tight cars, by sprinkling on the top of loaded cars, and by the removal or quick dilution by good ventilation of such dust as will inevitably be made, the danger from respiratory disease will be practically removed. Modern up-to-date blasting methods together with good ventilation will prevent diseases from gases and high temperatures. In fact coal mines can practically eliminate health hazards and make coal mining actually one of the most healthful of occupations.

## Cup-Shaped Cutter Bit Makes Big Power Saving

Eastern Kentucky Company Now Realizes the Inefficiency of Common Bits—New Bit Cuts Four Times as Many Places as Standard Bit

By J. H. EDWARDS

Associate Editor, *Coal Age*  
Huntington, W. Va.

THE North-East Coal Co., of Paintsville, Ky., has developed and is now using a mining-machine bit which is proving of interest to operators and under-cutter manufacturers. The new shape of bit is the idea of E. L. Burton, who is the blacksmith at the No. 1 mine. The service being obtained and the results of electrical test justly lead the North-East company to believe that they have a bit which is superior to any other now available.

A wide, "hollow-ground" cutting face is the distinguishing feature of this bit. The wide face provides cutting clearance and eliminates any wedging effect. The bits are hand-forged from ordinary pick-points which have been purchased from the mining-machine manufacturer. The only special equipment used in



Central Shop of North-East Coal Co.

This shop is well equipped with machine tools for handling the general run-of-mine repair work. Part of the building is reserved for armature winding. The open door at the left leads to an office provided for the shop foreman.



### Actual Power Tests on Machines Equipped with "Burton" and Ordinary Type Bits

Type of Bit	Mine	Length of Cut, Ft.	Feed of Machine In. Per Min.	Minutes to Sump and Cut Face	Average Volts	Average Amperes	Average Kilowatts	Watt-Hours Per Lineal Ft. of Cutting
Burton.....	No. 1	19	24	9.5	197	54.8	10.8	90
Pick-Point.....	No. 1	17	24	15	198	92.6	18.3	269
Burton.....	No. 3	28	18	18.5	216	51	11	121
Pick-Point.....	No. 3	13	24	13.5	188	88	16.5	284
Pick-Point.....	No. 3	21	18	24	219	48	10.5	200
Pick-Point.....	No. 7	25	18	21.5	215	67	14	205

forming it is a home-made anvil dolly. This is a block of steel the top of which is about 2 in. square. A groove about 1 in. wide and  $\frac{1}{2}$  in. deep is cut through the center, and in the bottom of this groove is a tapered V-shaped projection which, when the bit is placed upon it and hammered, hollows and spreads the face.

An ordinary pair of bit tongs is used, and the cutting angle to be formed is gaged by the angle of the tongs. The cutting face of the bit is ground slightly on an 8-in. emery wheel. Because of the hollowed face the wheel comes in contact with but a small area of metal, this area comprising the point and a narrow strip on each edge.

The bits are resharpened with the same tools and in the same way as they were originally formed from the standard bit, but, of course, the sharpening requires less time. Even the original grinding requires but a fraction of a minute for each bit.

The accompanying table summarizes the results of several electrical tests which the North-East company has made on shortwall machines equipped with the Burton and with the ordinary pick-point bits. Note the exceedingly good showing of 90 and 121 watt-hours per lineal foot of cutting in the two tests of Burton bits as compared to the results 200 to 284 with the ordinary bits. The two first tests, which are set apart at the top of the table were staged as competitive tests and therefore were carefully arranged as to similarity of conditions. The cutting in these two tests was done on the

same entry and on the same side of the entry using the same shortwall machine operated by the same crew. The Burton test was in Room No. 2 and the pick-point test in Room No. 3. The officials of the company feel that these two tests afford a true comparison of the two bits.

The last three tests listed in the table were made at random to determine the power required by the old-type bits under everyday conditions. These bits were hardened by the common "heat and plunge" method, but the points of the Burton bits and of the pick-point bits used in the one competitive test were hardened and then tempered to a straw color. In all cases plain water was used for hardening and tempering. All bits tested were of the ordinary grade of bit steel and were formed to a cutting angle of 35 to 37 deg.

Much care was taken in making the power tests. Re-



One of the Mines at Thealka, Ky.

It was in mine No. 1 that the carefully arranged competitive test was made between the "Burton" and the ordinary pick-point bits.

cording electric meters were not available, therefore simultaneous readings of indicating meters were taken every 30 sec. during the sumping and cutting. The values in the table are averages of these readings, and therefore are of sufficient accuracy to give a fairly true indication of the actual power taken by the machines.

#### NEW BIT INCREASES PLACES CUT

So far no mention has been made of the more practical and perhaps more important advantages of the Burton bit. Mining machines so equipped are now cutting an average of nine and a maximum of nineteen places with one set of bits as compared to an average of two and a maximum of four with the old pick-point bits. When using the old bits it was frequently necessary to "spot" during the first cut and in some cases bits were spotted three times while cutting a single place.

As to the character of cuttings or so called bug dust, no definite tests have been made, however, it is certain that the cuttings are coarser with the Burton bit. This is due to the sharp cutting edge and to the wide cutting face providing the clearance which eliminates any rubbing or wedging effect, thus actually cutting the coal instead of grinding it away.

These recent investigations and tests made by the North-East Coal Company were not confined to the Burton bit. Other types were made and tried, also several of the special arrangements now on the market were put into service but none of these were able to make as favorable a showing as did the new Burton bit.



Showing Details of "Burton" Bit

The one on the left has not been used since being re-formed into the Burton type. That on the right has been used and re-sharpened several times.





## News Of the Industry



### Illinois Miners, Says Fishwick, Are Willing to Give New Methods And Untried Machinery a Chance

Springfield, Ill., Nov. 22.—Miners and operators of Illinois are scanning the horizon for a Moses to lead them out of the darkness of present day economics into the light, Harry Fishwick, of Springfield, vice-president of the Illinois Mine Workers, declared today at the annual meeting of the Illinois Mining Institute.

Other speakers included D. D. Wilcox, operator, of Gillespie, president of the institute; A. J. Moorshead, president of the Madison Coal Corporation; D. J. Parker, safety engineer of the U. S. Bureau of Mines; J. W. Pearce, of the Goodman Mfg. Co., Chicago; Harley Smith, operator, of Chicago, and Martin Bolt, director of the Illinois State Department of Mines and Minerals.

Harry Fishwick's remark regarding the need of a Moses followed the suggestion of Mr. Moses, an Illinois operator, that the Illinois miners should submit to a reduction. "We are all living in a different age than formerly," Mr. Fishwick said. "We are all living better and we don't want to go back. We want to be respectable. I can speak for thirty or forty thousand miners in Illinois who haven't a job. It calls for a Moses to meet that problem. The capacity of Illinois mines is about two hundred million tons. About eighty million tons is consumed in Illinois, but only thirty million of that is Illinois coal."

Mr. Fishwick then gave his pledge on behalf of Illinois miners to stand by their "contract to try any new and untried machinery or systems of mining," but avoided any reference to the possibility of a separate scale. "We stand committed to the word of our contract," Mr. Fishwick said, "and will live up to it even if it takes our hide off. Where my name was placed on a contract, my honor stands with it to do the utmost to carry out every word, without thinking what effect it may have on my political future."

Mr. Fishwick condemned expansion of mining and declared that there should be federal legislation to prevent opening mines where not needed. He said it was the duty of this generation to "preserve for future generations at least their share of anything dug out of the earth for the benefit of all people."

"This generation," he added, "has no right to waste the prodigal resources of this country. I do not think that coal was placed in the earth so the twentieth century might waste it as it

pleased and leave the following generations, like Lazarus, to subsist on crumbs from the rich man's table.

"We should all try to forestall this calamity. To my mind we haven't the right to waste or develop any operation when we can't promise that a market will be ready for the product. We need not go far afield to find something wrong with the industry."

J. W. Pearce, of the Goodman Mfg. Co., which has two loading machines in operation in this state, spoke of the possibilities of mechanical loaders. Mr. Moorshead, president of the Madison Coal Corporation, urged the operators present to visit other mines and copy the cream of the ideas there for their own use. Mr. Parker, of the Bureau of Mines, bespoke a closer co-operation between the State Department of Mines and the federal bureau, that mine accidents might be lessened.

In the election of officers Harvey L. Smith, Chicago operator, was named president; E. G. Lewis, superintendent of the Chicago Sandoval Coal Co., at Sandoval, was named first vice-president; William E. Kidd, Peoria district mine inspector, second vice-president; Martin Bolt, secretary-treasurer, and J. A. Jeffries, St. Louis; L. E. Young, St. Louis; John Land, West Frankfort; George K. Larrimore, Springfield, and F. F. Tirre, St. Louis, members of the executive board.

### Priority Orders Upheld in Supreme Court Ruling

Congress has the constitutional right to authorize the issuance by the Interstate Commerce Commission of priority orders in the use of railroad cars in times of emergency, the Supreme Court held last week in an opinion delivered by Justice Holmes in a case brought by Edward P. Avent, Jr., of Michigan, from the federal District Court at Cincinnati, Ohio. That Congress has such power "no longer admits of dispute," the court declared.

Congress did not exceed its authority, the court declared, when in the Transportation Act of 1920 it authorized the commission, whenever it is of the opinion that shortage of equipment, congestion of traffic or other emergency exists in any section of the country, to suspend its rules as to car service and to make such reasonable rules with regard to it as in the commission's opin-

### Rate War Is Starting

Will the coal freight rate fabric of the Midwest and Northwest be completely upset and reconstructed again soon? This is a possibility in view of events of the week. The Interstate Commerce Commission has called to Washington for a Wednesday session representatives of many Midwestern lines as a result of the powerful protest the Illinois and Indiana coal producers have made against permitting the C. & O. and the N. & W. to make drastic reductions Dec. 5 on West Virginia and Kentucky coal going to Iowa and the Northwest. The L. & N. has announced a 15c. drop on coal to Minneapolis and St. Paul on Dec. 6 to meet the other two roads. These two cuts practically shut the Midwest mines out of a great market in which they have already suffered by the recent Lake Dock rate decision and there is much talk of a general reconstruction of rates. Meantime the Midwest hopes the commission will suspend the new low tariffs to the Northwest now dated Dec. 5 and Dec. 6.

ion will best promote the service in the public interest, and among other things to give direction for preference or priority in the transportation or movement of traffic.

In July, 1922, during the railroad shopmen's strike, the commission issued an emergency order regulating the use of coal cars at mines. It classified the different demands for coal and provided the order in which shipments could be made to meet them. In this order the making of gas fell into the second classification.

While the emergency order was in effect Avent ordered a shipment of coal from Kentucky to Union City, Mich., upon the representation that it was to be used by a gas company there. When the coal reached its destination it was diverted by Avent to a portland cement company, which was in the fifth classification. Avent was indicted for fraudulently inducing the railroads to ship the coal in violation of the commission's order. He pleaded guilty and was sentenced to a fine of \$2,000.

As the case presented other questions aside from the challenge of the constitutionality of the commission's preference order, it was sent to the Sixth Circuit Court of Appeals for such action as it might be necessary for that court to take in view of the decision rendered by the Supreme Court.



## Adopt Plan to Curb Waste of Timber And Encourage Reforestation

A broad program looking to drastic reduction in the waste of forest products and definite encouragement of reforestation was agreed upon at the National Conference on Utilization of Forest Products held in Washington, D. C., Nov. 19 and 20. Not only did the conference adopt the program but it provided a permanent organization to see that the program is carried out. This action is in contrast with many conferences where the enthusiasm is confined largely to the meeting itself and no provision for carrying on is made.

In providing the means for carrying out the resolutions of the conference a going organization was chosen. In view of the marked success which has followed the work of the Central Committee on Lumber Standards, of which John W. Blodgett, of Grand Rapids, is chairman, it was the sense of the conference that its scope should be enlarged so as to include in its objective the purposes of this conference, which are related to the work it has been doing.

The Central Committee on Lumber Standards was established two years ago at the suggestion of Herbert Hoover, Secretary of Commerce. Through it the industry has agreed upon a program of standardization and an elimination of excess variety which Secretary Hoover estimates will result in an annual saving of \$250,000,000. With the experience it has gained in this work and with the assistance of additional members with accurate knowledge of the two thousand uses to which forest products are put, another striking manifestation of beneficial co-operation among industries is predicted. The name of the committee is to become "Central Committee on Utilization of Forest Products."

### Eminent Committee Chosen

It is generally agreed that the successful outcome of the conference was due in no small measure to the committee on permanent organization and program, which was comprised as follows: A. C. Goodyear, president, Great Southern Lumber Co. (chairman); A. R. Joyce, Joyce-Watkins Co. (secretary); O. E. Bradfute, president, American Farm Bureau Federation; O. M. Butler, secretary, American Forestry Association; E. L. Carpenter, president, Shevlin-Carpenter-Clark Co.; Harry B. Curtin, president, National Hardwood Lumber Association; E. J. Curtis, vice-president, the Curtis Co.; W. Z. Georgia, president, National Wood Chemists Association; Elliott H. Goodwin, vice-president, U. S. Chamber of Commerce; Henry Graves, dean, Yale Forestry School; Charles A. Herty, president, Synthetic Organic Chemical Manufacturers' Association; Elmer C. Hole, managing editor, *American Lumberman*; John E. Lloyd, president William M. Lloyd Co.; B. S. Masters, National Association of Box Manufacturers; John C. Merriam, president, Carnegie Institution; J. Malcolm Muir, Associated Advertising Clubs of

the World; Warren R. Roberts, American Mining Congress; C. H. Sherrill, president, Sherrill Hardwood Lumber Co.; Henry W. Stokes, president, American Paper & Pulp Association; E. H. Stoner, president Western Pennsylvania Lumber Co.; R. Y. Stuart, commissioner of Forestry of Pennsylvania; W. B. Swift, International Harvester Co.; W. A. Thomas, president, Statesville (N. C.) Furniture Co.; Frank G. Wismer, president, National Lumber Manufacturers' Association.

It was this committee of men of large affairs who drew up the plan of campaign for the nationwide effort which is to be put forth. This is the way the committee states the problem:

"An adequate supply of timber is essential to the industrial development of the country and to the maintenance of present standards of living, as well as to the prosperity of the people and industries dependent on the forests.

"Regional timber shortages and consequent high cost already are making themselves felt to manufacturers and users alike and will become increasingly serious during the many years needed to get into effect an adequate program of timber growing.

"More careful utilization of forest products offers an immediate means of prolonging our supply of timber and should be recognized in the national program of forestry as of equal importance with timber growing and protection.

"Knowledge of better utilization has outstripped practice and should be applied wherever economically feasible as a necessary measure to reduce the drain on the forests.

"Through further research, understanding and co-operation it will be possible still further progressively to reduce the drain on the forests.

"Reducing needless drain will tend to lower the cost of raw material, will create additional sources of profit from material now wasted, and will lengthen the life of plant investments by prolonging the supply of raw material.

"The task of reducing these losses is a joint responsibility of the industrial, commercial, agricultural, governmental, educational and professional interests, and the general public."

### Western Kentucky Strike Is Slowly Breaking

It is reported from Central City, Ky., that the Gibraltar Coal Co. on Tuesday, Nov. 18, started cleaning up its mines three miles from Central City, and expected to start shipping this week. This is the second mine within five miles of the heart of the strike zone to start operations within a week, the Oakland Coal Mining Co. having started a few days ago. Miners are a little slow in reporting, but it is believed that crews will come in faster if there is no trouble.

## Complete Storage Report Of Engineers Now Ready; Consumer His Own Doctor

The report of the Coal Storage Committee of the American Engineering Council has been completed and will be issued to the public this week. James Hartness, former Governor of Vermont, president of the Council, says that the survey, called the biggest undertaking of its kind ever carried on in this field, shows that storage is the remedy for the nation's coal troubles and that the consumer should take the initiative in setting in motion the cycle necessary to provide at all times abundant fuel at less cost for industry and the home. Most of the recommendations of the committee have been published.

John Hays Hammond, who was chairman of the U. S. Coal Commission, appointed by President Harding, writes in the foreword to the report:

"This report on an engineering survey of the possibilities of improving the method of purchase, delivery and storage of coal should appeal to producers, carriers and consumers as the key to the solution of many of their troubles. The President's Coal Commission, learning of the purpose of the American Engineering Council to make such a study, assigned to it the task of conducting an extended engineering survey of the storage of coal.

"The commission and other government departments have collaborated with the American Engineering Council extensively, the survey has been conducted by over 400 engineers in leading industrial centers, and the report has been formulated by a committee of prominent engineers.

"The operation of the coal industry probably is beset with more difficulty than any other of the great American industries, due to prevailing intermittence of operation. If this evil could be removed it is plainly evident that a tremendous step would be taken in regularizing the coal industry and in helping other industries which are partly or wholly dependent on coal. The situation undoubtedly lies in greater storage.

"A reasonable accumulation in storage will permit of more even production throughout the year, deflation of the coal industry, continuous employment of labor, relief of congestion on railroads during their maximum demand season, removal of the coal 'feast or famine' conditions among consumers and many other allied troubles that are now felt as coal takes its course from mine to point of combustion. The fears of loss by the consumer have been studied by the committee and largely dispelled.

"In the past the operators have said that storage is the duty of the railroad whereas the carriers have contended that it is the duty of the consumer, and as a result storing has been neglected. This cycle must be broken, and a unified, economically sound practice established. The report wisely recommends and urges that the consumer, potentially the largest benefactor, should apply the needed balance wheel through himself initiating storage."



## Unions Threaten Boycott Against Stone Unless He Employs Union Miners

*Special to Coal Age*

El Paso, Texas, Nov. 24.—The United Mine Workers, failing to get the American Federation of Labor to condemn the Brotherhood of Locomotive Engineers for running the Coal River Collieries, in West Virginia, open shop, finally won a point Saturday in the Federation convention here. The convention unanimously passed a resolution empowering the executive council to exercise its good offices to adjust the dispute between the miners and engineers. If a settlement is impossible the council is to "advise the membership of all facts in the premises." This was a substitute for a resolution filed by William Turnblazer, a miner, at the beginning of the convention.

Advising the membership of "all facts in the premises" is a euphemism for a boycott. To warn the organized workers of the United States that Mr. Stone, head of a powerful labor union, is unfair to union labor in his capacity as director of the Coal River collieries would be followed by the withdrawal of trade unions from association in all capacities with the engineers' financial enterprises such as banks and mines, according to leaders of the Federation.

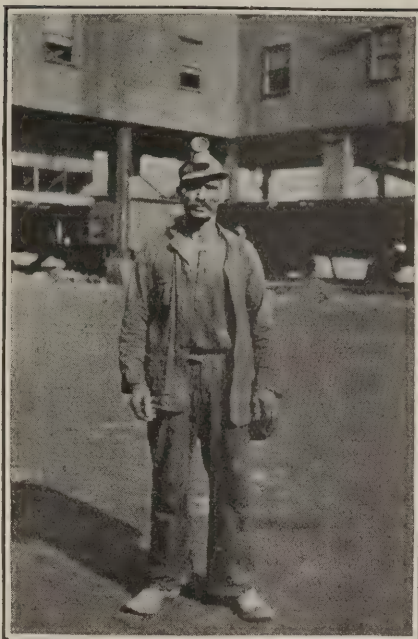
### "One More Chance" for Stone

The resolution, presented by the Committee on Boycotts, of which Frank Farrington, president of the Illinois miners' union, is chairman, was a substitute for two resolutions which asked the convention at this time to present all the facts in the case to the affiliated unions. Representatives of the railroad unions in the Federation appeared before the committee and pleaded for "one more chance" for Mr. Stone, whose union is not affiliated with the Federation. The committee complied with the request and in its substitute motion stated:

"Your committee finds that a strike has been in effect at four mines of the Coal River collieries in West Virginia since April 1 of this year, due to the failure of this company to renew its wage agreement with the United Mine Workers. We find further that the officers of the United Mine Workers have made repeated but fruitless efforts to reach a settlement with Warren S. Stone, chairman of the Board of Directors of this corporation, which assumes responsibility for its labor policy. We find also that this coal company has served eviction notices upon the union men who are on strike and has resorted to the employment of strikebreakers.

"In view of these facts and as a further constructive effort, your committee recommends the following:

"That the Executive Council of the American Federation of Labor be instructed to exercise its good offices to secure a settlement of this unfortunate controversy at the earliest possible date; that in the event of failure of such negotiations the Executive Council be instructed to advise the membership of the American Federation of Labor of all the facts in the premises."



**Holds One Job Ten Years**

Many producing companies are subject to much annoyance because of the rapid turnover in labor. Frank Furrence, pictured above, does not cause his employers much worry in that regard, however, as he has been with the same company for ten years. He has been a loader for the Island Creek Coal Co. at Monaville, W. Va., for the last nine years, working so steadily that his brass checks are so nearly worn out that he needs a new set.

John L. Lewis, president of the United Mine Workers, said that the officials of the miners' union were fully in agreement with those who offered the original resolutions and with the committee on boycotts.

He desired to spare the convention a long debate on the resolution, and spoke of having heard "mutterings in some quarters" of an intention to provoke a long debate. He warned those who had such an intention that the mine workers "can engage in a debate *ad infinitum*" if there were opposition to the committee's report. He would discuss the case in detail. Otherwise he would say nothing.

The motion was put. Discussion was called. There was no response and the resolution was adopted unanimously.

By his action Mr. Lewis disarmed his antagonists in advance and prevented a debate that would have lasted four or five hours and which would, undoubtedly, have been extremely acrimonious.

John L. Lewis, president of the miners, and Ellis Searles, miners' union publicity man, consider that the resolution strengthens the miners by enlisting the full influence of the Federation on their side. The resolutions committee proposed the substitute as more constructive than Turnblazer's report, which was altogether denunciatory. William R. Johnson, president International Machinists, previously opposed condemnation of Stone as unfortunate for the labor movement, but did not oppose substitute resolution.

The new situation gives the miners a chance to drag the whole case into the public eye again, which is all they hoped for.

## \$2,000,000 Electric Program Launched at Frick Plants

The H. C. Frick Coke Co. has awarded contracts for the complete electrification of five more plants and partial use of this power in two more in Fayette County, Pennsylvania. The work will commence at once and will require several months to complete. A total expenditure of \$2,000,000 is involved.

The five plants to be totally electrified are Leisenring No. 1, Lambert, Gates No. 1 and No. 2 and Ralph. At Leisenring No. 3 and Redstone electricity will be used for all work except hoisting coal. The maximum power demand for the seven mines will be 8,200 hp.

The company has been increasing operations during the past week. A total of 240 ovens was fired at York Run, Phillips, Continental No. 1 and Hecla plants. On Monday 175 ovens were added at Southwest and on Tuesday 200 were added at Lemont.

The plant of the Republic Iron & Steel Co. at Republic was reopened after being idle for a year.

At the Lynn plant of the Snowdon Coke Co. near Brownsville, 102 additional ovens were fired. There are now 270 ovens out of 300 in operation.

Effective immediately the Brier Hill and Nemacolin plants of the Buckeye Coal Co., a subsidiary of the Youngstown Sheet & Tube Co., will go on full time. These mines ship raw coal to Youngstown.

## Pittsburgh Mining Institute May Be Formed

Mine officials and those who aspire for this ranking in the Pittsburgh district are said to be discussing the formation of what may ultimately be termed the Pittsburgh Mining Institute. The purpose of the body, if it becomes a reality, will be to provide a clearing house for information on coal mining. It is proposed to meet two, three or four times a year for the discussion of practical problems.

At the tenth annual banquet held under the auspices of John I. Pratt, state inspector of the Seventeenth bituminous district of Pennsylvania, attended by mine workers, mine officials and affiliated interests, and held at Kaufmann's store, Pittsburgh, on the evening of Nov. 22, Bill McCoy proposed that such an institute be formed and John I. Pratt was requested to appoint a committee to consider the advisability of that step. About 1,100 persons were present, an attendance that is said to be a record for affairs of this kind.

The speakers of the evening were Capt. Edward Steidle, supervisor of the co-operative mining department, Carnegie Institute of Technology, who in a few words greeted those in attendance; A. R. Pollack, general manager of the Ford Collieries, who talked about the responsibility for safety in bituminous mines; Rush N. Hosler, general manager Pennsylvania rating compensation bureau, who interpreted accident and lost-time statistics in Pennsylvania mines, and William J. McCoy, who talked briefly on mining education.



## Union Drive in West Virginia Makes Scant Progress

The United Mine Workers has begun a drive to recover some of the ground lost in the southern West Virginia coal fields. A large force of organizers, at the instance of John L. Lewis, president of the union, have been holding meetings on Coal River and elsewhere in the Kanawha field in an effort to get the men back into the union and shut down the mines so as to bring about a recognition of the union. The effort has been attended by only partial success, for although some of the men who have been working non-union for the last two years have gone on strike, enough have remained at work to prevent serious interruption to operations.

Even two of the mines of the Coal River Collieries Co., owned by the Brotherhood of Locomotive Engineers, are operating. The third mine, it is understood, has been shut down. Other plants in the Boone County field have been shut down for a day or so but production has not been materially impaired. It is learned that where one or two companies have signed an agreement with the union operators are cutting expenses by not paying for certain kinds of work such as dead work.

So long as the market price of coal is low, some operators feel that the miners will work for the lower wage scale, but whenever the price of coal goes up, the miners will demand the higher scale and will rejoin the union unless they receive such increase.

## Slump in Coal Output Shown In Railway Report

There have been 6,916,658 tons less of bituminous coal dumped at Lake Erie ports during the present season up to Nov. 2 than were dumped during the same period of 1923, according to the report of the Car Service Division of the American Railway Association submitted to the Board of Directors at a meeting of that body held in New York on Nov. 18 and 19. During the period ending Oct. 1 bituminous coal on hand at the Head of the Lakes totaled 4,911,439 tons, a decrease of 181,462 tons when compared with the corresponding date of the previous year. The report says that during the season up to Nov. 2 there were dumped at Lake Erie ports 21,001,413 tons as compared with 27,918,071 tons during the corresponding period of 1923.

Dumpings last year were greatly in excess of any previous year, the report says, and resulted in heavy carryover of coal at the Head of the Lakes at the beginning of the 1924 season, which with the coal dumped to date at Lake Erie ports together with anticipated dumpings the balance of the season will provide an ample supply of coal at upper lake ports to meet all requirements.

Movement of coal to New England shows a marked decrease compared with last year. This failure to accumulate coal in that territory in greater volume during the season, the report declares, undoubtedly will mean a heavy movement during the winter and possibly under unfavorable weather condi-



Louis W. Huber

Recently appointed instructor in the department of metallurgical and mining engineering at Carnegie Institute of Technology, Pittsburgh, Pa. Mr. Huber was graduated in mining engineering from Illinois University in 1921. After obtaining his degree he went with the La Salle Carbon County Coal Co., Carbon County, Ill., and later was associated with the B. F. Sturtevant Co., of Chicago.

tions. Between Jan. 1 and Nov. 1 bituminous coal moved all rail to New England totaled 112,675 carloads as compared with 169,175 carloads during the corresponding period of 1923, a decrease of 56,500 carloads.

During the period Jan. 1 to Oct. 1 tidewater shipments of bituminous coal to New England were 7,255,591 gross tons, a decrease of 2,084,712 gross tons when compared with the corresponding period of last year. Shipments of anthracite to New England during the ten months of 1924 ended Nov. 1 were 245,831 cars, as compared with 319,057 cars in the corresponding period of 1923, a decrease of 73,226 cars.

The report shows that during the first 44 weeks of 1924 coal loading amounted to 7,092,598 cars and coke loading to 432,019 cars as compared with 8,158,120 cars and 628,083 cars respectively in 1923. Coal cars put in service during the first nine months of this year totaled 36,526, whereas during the twelve months of 1923 they amounted to 83,296 cars. Coal cars on order on Oct. 1, 1924, totaled 12,793, as compared with 26,541 on the corresponding date of 1923.

Coal production in British Columbia in September was 124,169 tons, which is 7,115 tons less than in August. The Canadian Collieries (D), Ltd., produced 37,013 tons during September, as against 41,708 tons in the preceding month. The Western Fuel Corporation of Canada, Ltd., had a September output of 35,206 tons, as compared with 41,413 in August. Slight increases were made by the Granby Consolidated M. S. & P. Co., Ltd., Cassidy; the East Wellington Coal Co., and King & Foster. The Nanoose Wellington Collieries produced in September 8,075 tons and in August, 8,122 tons. In the Nicola-Princeton district there has been some increase.

## \$30,000,000 Power Plant Planned on Lake Erie

A 400,000 hp. steam-electric generating station, to cost about \$30,000,000 and to serve as an important contribution to one of the Middle West's superpower systems, is to be constructed soon at Avon, Ohio, on Lake Erie, west of Cleveland, by the Cleveland Electric Illuminating Co., a subsidiary of the North American Co., F. L. Dame, president of the North American, announces.

"The new Avon station will tie in with the same company's Lake Shore station in Cleveland, which is the world's largest steam-electric plant under one roof," Mr. Dame said. "These two sister generating stations will, upon completion of the Avon project, have a combined power exceeding that now being taken from Niagara Falls."

This source of power is located at the northern end of superpower transmission lines running south to the Ohio River region, carrying energy into many iron and coal cities over the distribution systems of the Cleveland Electric Illuminating Co., the Northern Ohio Traction & Light Co., the Ohio Public Service Co. and the Ohio Power Co.

"In line with the practice of all the larger plants of the North American Co. subsidiaries," said Mr. Dame, "Avon station will be equipped to burn pulverized coal, an installation whereby fuel is ground into powder, mixed with warm air, and burned like gas at a temperature of 3,000 deg. By this method upward of 93 per cent of the heat energy in coal is being transformed into steam to turn the turbines as compared with 65 to 85 per cent in the old type crushed coal stokers."

## Coal Road to Extend Line

Extensive improvements are reported to be under way on the Wellsburg, Bethany & Washington Ry., which operates between Wellsburg, W. Va., and Bethany, Pa., preparatory to extending the line to Washington, Pa., from Bethany. The road was recently taken over by the Buffalo Valley Collieries Co.

Appropriations have been made by this company for the improvement of the roadbed of the electric railway system and additional appropriations are expected before the end of the year.

Two coal towns to house miners and workers are contemplated, one three miles north of Bethany, the other about three miles south of the village. The traction line divested of many of its tortuous curves, will be used to convey coal from the fields to Wellsburg. The problem of moving it to the railway, seven miles distant from Bethany, has been the main factor in delaying the work in the past.

Upon the completion of the improvements now in progress fifteen minute service will be offered between Wellsburg and Bethany with high speed cars. The remainder of the trip to Washington will require about an hour, upon the completion of that roadbed within the next two years.



# H. L. Doherty Urges Legislation to Curb Overproduction of Oil

Oil and Public Utility Operator Relies on State Action to Protect the Industry—Proposal Is Worthy of Study by Those Having Welfare of Coal at Heart

BY PAUL WOOTON  
Washington Correspondent of Coal Age

The news from Cleveland last week contained a valuable suggestion for the coal industry. Henry L. Doherty, an oil and public utility operator who long has been known as a champion of the public welfare regardless of the immediate effect upon his own business, came out flat-footedly, in an address before the National Petroleum Marketers' Association, for a program of legislation that would make it possible to end profligate output of petroleum.

In his paper Mr. Doherty goes into detail as to his proposals for legislation, but for the purposes of this article all that it is necessary to know is that he places chief reliance on state action. Apparently he looks to the federal government to lend its moral influence to the proposal. In fact, it is known that thought now is being given to calling a conference in Washington of petroleum producers to discuss ways and means of conserving our oil resources by checking the waste incident to overproduction.

Reference already has been made in this correspondence to the striking parallel between coal and oil in the matter of overproduction. It ravishes each industry and takes an enormous toll from the public and from posterity. In oil it has meant wanton waste of a diminishing resource. In coal it has meant the abandonment of hundreds of mines when only partly worked out. It has meant starvation wages when calculated on an annual basis. It has meant crushing losses to thousands of investors.

All of this has been clear to the coal industry itself, but that industry has not visualized so clearly how much its uncomfortable situation is due to overproduction in oil.

The total production of soft coal in the United States in 1923 was 560,000,000 tons. This looks sizable, but, as we now know, it includes a very large quantity put in storage which is being liquidated this year. The average production over the two-year period probably will be 510,000,000 tons. The average would have been much higher had there been nothing to interfere with the normal growth of new business. For a long period that normal growth was 17,000,000 tons annually. It has been five years since the war. Five times 17,000,000 tons is 85,000,000 tons. The country had reached a normal output of 520,000,000 tons in 1917.

The normal expectation of the coal industry, based on former experience, therefore, would be 520,000,000 tons plus 85,000,000, or 605,000,000 tons, which probably would have been the 1924 production had there not been a powerful competitor in the field. That business has gone to oil—partly to fuel oil, mostly to gasoline. That the big loss has been to petroleum is quite evident to anyone who will reduce the supplies of the several fuels to their heating value and compare the result. Here it is:

Per Cent of Total Heating Value in Coal and by Petroleum

Year	Anthracite	Bituminous	Total Coal	Oil and Gas (A)	Total Mineral Fuels
1923.....	14	73	87	13	100
1918.....	13	78	85	15	100
1924 (B)...	12	61	73	28	100

(A) Includes imports.  
(B) Based on preliminary estimates of production.

This shows where the coal market

has gone. Overproduction of oil has thrown on the fuel market ever increasing quantities of fuel oil and gasoline. It had to be sold at prices which would move each of them rapidly. Under present conditions there is no bottom to petroleum prices. Whatever may be said of the cost of production from pumping wells there is no bottom to cost of production from gushers. In 1923 California crude oil actually invaded Mexico. It went through the Panama Canal in great quantities for use on the Atlantic Coast, where it was sold under the noses of non-producers.

Mr. Doherty has raised a voice in the camp of the oil producers. The question now is, who will raise a voice among the coal producers?

Mr. Doherty's program for oil apparently is a good program for coal. None disputes that it is high time to limit the wasteful competition which sacrifices labor, standards of living and the coal resources at one and the same time. Mr. Doherty predicts that many oil operators will object to any such plan. It is certain also that many coal operators will object, but there is substantial opinion that it constitutes the chief prospect for their salvation. The oil industry is pleading for the right to prevent waste by co-operation. Its cause will be strengthened and success made more likely if the coal industry will join in the movement to procure the right to co-operate for the public good.

Northern Pacific Wants Coal

The Northern Pacific Ry. requests bids for its coal requirements from Dec. 1, 1924, to April 30, 1926, for the line extending from Jamestown, N. D., to Spokane, Wash. Not less than 500,000 nor more than 1,500,000 net tons will be required. The coal must be delivered f.o.b. cars on Northern Pacific Ry. tracks in as nearly equal monthly proportions as practicable in accordance with the company's requirements, commencing Dec. 1, 1924, and ending April 30, 1926.

Bids must be submitted to R. J. Elliott, purchasing agent, Railroad Building, 5th and Jackson Streets, St. Paul, Minn., by noon, Central Standard time, Dec. 1, 1924.

## Output and Value of Coal from Missouri Mines in 1923

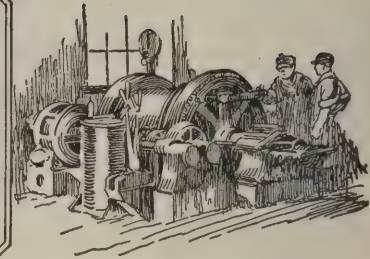
(Compiled by U. S. Geological Survey)												
County	Loaded at mines for shipment (net tons)	Sold to local trade and used by employees (net tons)	Used at mines for steam and heat (net tons)	Made into coke at mines (net tons)	Total quantity (net tons)	Total value	Average value per ton	Number of employees				Average number of days worked
								Underground—Miners, a	All others	Surface	Total	
Adair.....	238,846	5,883	7,054		251,783	\$744,000	\$2.76	369	116	49	534	160
Andrain.....	5,558	10,314	87		15,959	62,000	3.88	38	14	6	58	263
Barton.....	658,822	6,913	38,355		704,090	2,221,000	3.15	87	14	693	794	93
Bates.....	114,245	1,839	3,850		119,934	318,000	2.65	99	23	96	218	130
Boone and Chariton.....		12,150	50		12,200	38,000	3.11	32	8	6	46	223
Caldwell, Clay, Dade, and Platte.....	60,517	32,277	2,498		95,292	358,000	3.76	189	54	22	265	212
Callaway.....	6,800	19,602	200		26,602	110,000	4.13	46	14	7	67	202
Grundy, Harrison and Schuyler.....	3,284	8,426	500		12,210	66,000	5.41	51	12	5	68	133
Henry.....	107,600	5,669	1,825		115,094	318,000	2.76	19	3	95	117	170
Johnson.....	56,075	1,458	967		58,500	206,000	3.52	49	20	30	99	181
Lafayette.....	470,938	23,796	16,543		511,277	1,985,000	3.88	757	303	101	1,161	187
Linn.....	5,126	22,674	164		27,964	150,000	5.36	140	66	19	225	76
Macon.....	550,348	10,909	10,093		571,350	1,767,000	3.09	764	223	64	1,051	192
Putnam.....	12,869				12,869	48,000	3.71	85	24	11	120	363
Randolph.....	222,612	6,517	4,400		233,529	796,000	3.41	306	70	38	414	196
Ray.....	474,054	41,110	3,469		518,633	2,048,000	3.95	1,126	357	109	1,592	136
Vernon.....	7,478	212	134		7,824	21,000	2.68	35	8	9	52	40
Other counties b.....	17,164	1,698	240		19,102	52,000	2.72	25	6	40	71	135
Total, excluding wagon mines.....	3,012,336	211,447	90,429		3,314,212	11,308,000	3.41	4,217	1,335	1,400	6,952	155
Wagon mines served by rail.....	88,939				88,939	267,000	3.00					
Grand total.....	3,101,275	211,447	90,429		3,403,151	11,575,000	3.40					

a Includes also loaders and shotfirers. b Cass, Lincoln, Ralls and St. Clair.





## Practical Pointers For Electrical And Mechanical Men



### Automatic Cager Speeds Loading and Unloading at Shaft Bottom

New Device Installed in Auxiliary Shaft of Illinois Mine—  
Hoisting Operation Made Continuous—No  
Limit to Number of Redumps

**O**LD tramming methods have long ago been abandoned in mines where high production records are made at low cost. Aside from the fact that automatic caging has resulted in savings and made possible large output the ease and safety with which the cars are placed on the cage are important factors.

Nearly every coal mine has some conditions about its caging problem which are different from others, but essentially the problem is one of accurately caging the car and getting the empty one off as quickly as possible. Many devices have been made to cage the cars but the best results are obtained only when the supply of loaded cars is co-ordinated with the system of placing them on the cage.

At the Donk Bros. Coal & Coke Co.'s Thermal mine No. 4 near Edwardsville, Ill., William Palecek, mine manager, and Fred Braske, mechanic, have developed a caging device which helps materially in speeding up the caging and hoisting of mine cars. Occasionally it is necessary to raise the mine cars to the surface through the auxiliary shaft and it was here that this device was installed, but usually the coal is hoisted in a skip in the main shaft.

#### NEARLY 100 PER CENT AUTOMATIC

The automatic caging equipment thus developed is interesting in that it is almost 100-per cent automatic, and as a result the hoisting operation is continuous. Two loaded tracks run direct to the shaft which is of the double-compartment type. Empty cars leave the cages on one side of the shaft and the loads enter on the other. All hoisting is done in balance, the cage at the foot being loaded while the one at the top is unloaded.

Between rails of the loaded tracks is placed a heavy steel shaft as shown in Fig. 1. On each shaft two car stops are arranged so that when one is in the up position the other is down. The purpose of these stops is to catch the axle of a car and hold it in place until released. The shafts are interlocked so that the rear car stop on one track is up when the rear stop on the other is down. Owing to the location and

position of the other two stops the same relation applies, namely when one is up, the other is down. If the rear stop on one track is up and ready to stop a car only the forward stop on the other track is in the engaging position.

#### HEAVY SPRINGS ABSORB SHOCK

The interlocking arm between the two tracks keeps the two bars so related to each other that when the rear stop on one track is holding a car the forward stop on the other track also holds a car. Heavy springs take the shock of a car when it bumps a stopping block and this has greatly reduced the repair and maintenance of the device and the cars.

On the end of each bar and extending into the sump is a heavily constructed crank or arm. The two cranks are so arranged and related to each other that as the cage descends to the landing a block on the cage turns the crank.

When the caging device is in service a car on one track is held against the forward stop while another car is held against the rear stop on the other track. When the cage descends, it strikes the operating arm on the first-mentioned track, and the car on the front stop passes onto the cage. This same operation releases the car held by the rear stop on the other track, and it proceeds to the forward stop on its track. At the same time the rear stop on the first track has raised and it holds the next approaching car. When the opposite cage descends it turns the bars of the caging device so that a car is loaded from the track leading to that side of the shaft and the other cars progress toward the cage as already described.

In this manner a car is caged from each track alternately. An added fea-

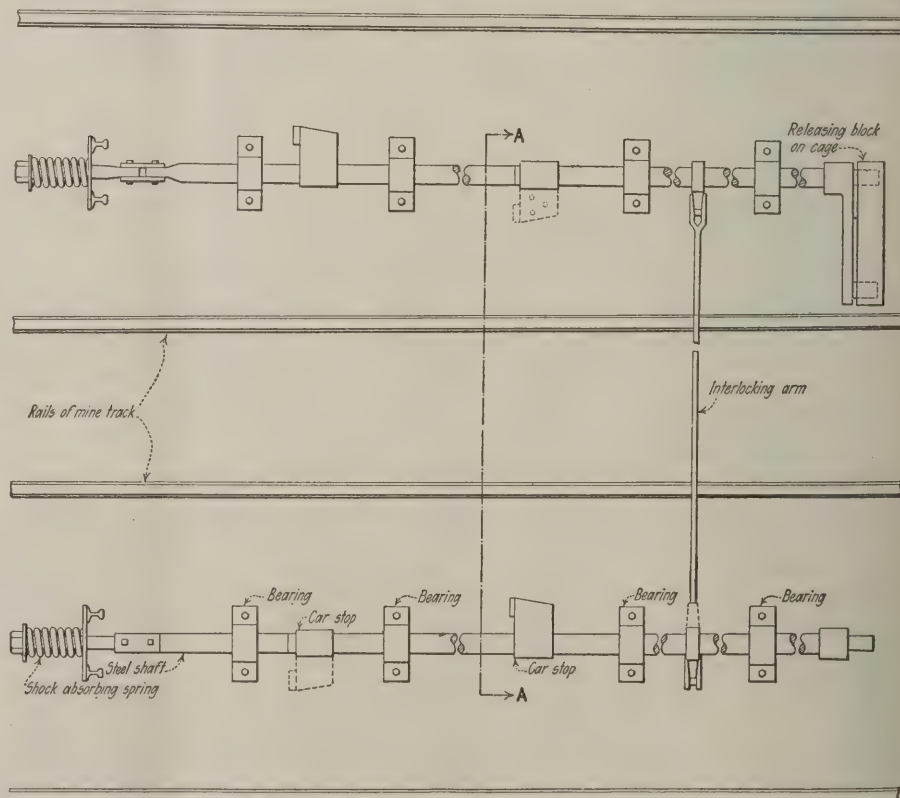


Fig. 1—Automatic Cager Permits Any Number of Redumps

The descending cage in one compartment releases a car which is caged immediately. At the same time a car on the opposite track is permitted to proceed toward the other compartment, but is held in position until the other cage comes down and releases it.



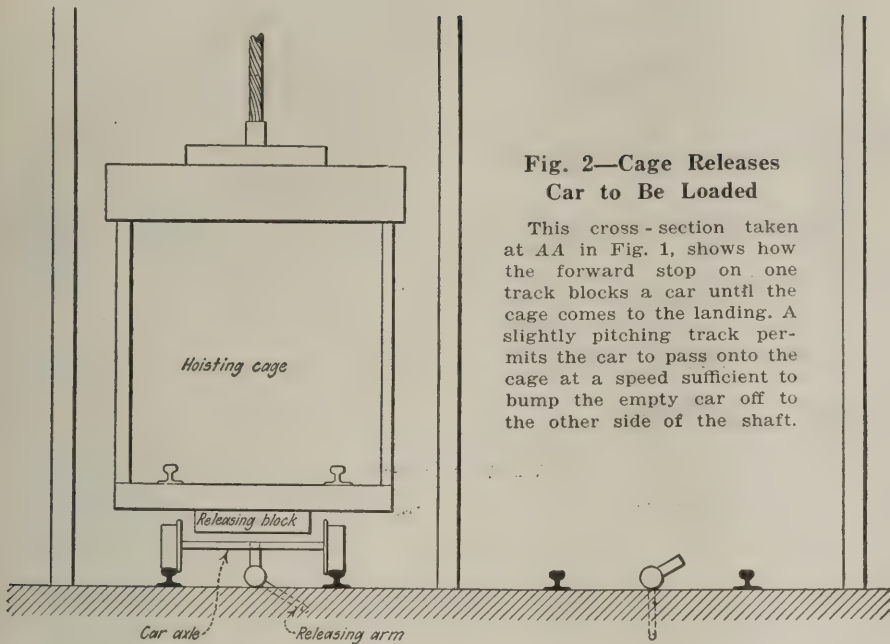


Fig. 2—Cage Releases Car to Be Loaded

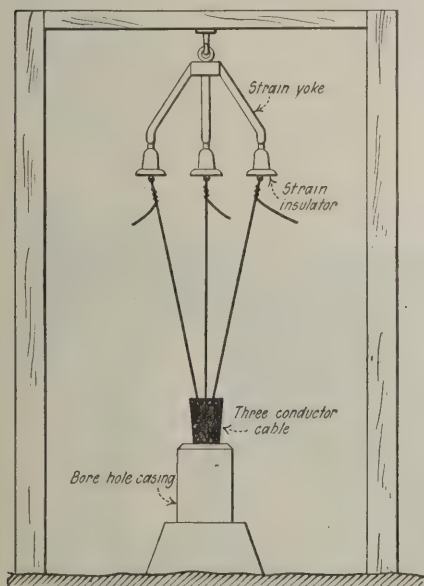
This cross-section taken at AA in Fig. 1, shows how the forward stop on one track blocks a car until the cage comes to the landing. A slightly pitching track permits the car to pass onto the cage at a speed sufficient to bump the empty car off to the other side of the shaft.

ture of the device is that as many redumps as necessary may be made at any time without interfering with the sequence of operations of the caging device.

The designers have patented the mechanism and to date have been successful in supplying instructions and prints for its installation at other mines.

## Method of Equalizing Strain on Suspended Cables

With the use of alternating current for substations, hoists and pumps, within mines a suitable method for suspending three-conductor cables over bore-



### Strain Yoke Distributes Load

Each conductor must take its share of the load because of the equalizing effect of the strain yoke. Porcelain insulators prevent current leakages much better than wooden rolls, around which the cable is commonly wrapped in other types of bore-hole mountings.

holes has become necessary. The suspension should be arranged so that the strain cannot be concentrated on a single wire. Frequently due to the

arrangement of the supporting structure and the manner in which the cable is suspended, one conductor is compelled to carry the entire weight of the cable. This is not only overloads that wire but also causes accidents. When the wire breaks or slips the cable receives a sudden jerk and frequently the conductors snap and the cable falls, piling up at the foot of the borehole.

### PERFECT BALANCE OBTAINED

A novel method for equalizing the strains on the various conductors is shown in the illustration. The strain yoke is a heavy iron fitting built somewhat in the form of a tripod. An insulator is hung on each leg of the yoke, and each conductor is fastened to an insulator. The strain insulators prevent current leaks that otherwise would be caused by the insulation on the wire being broken where it is twisted and tied. A perfect balance between the three conductors is obtained because the strain yoke will tilt into a position so that each wire will carry its proportionate share of the load.

It will be noted that the borehole casing extends above the ground level. This is necessary to prevent water and especially snow from getting into the cable. It is always good practice to pour paraffin or wax on the outside of the cable, especially where the latter comes through the borehole casing. This seals the casing and conductor together so that moisture cannot work its way into the insulation.

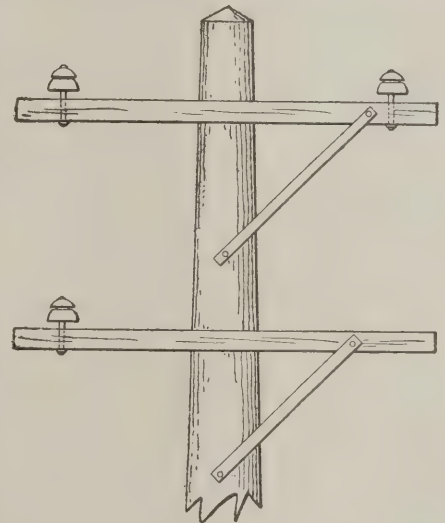
The breaking of any one of the conductors is not merely objectionable because of the danger of a total failure of the line or because of the need of repair, but also because the breakage of the wire results in a phase failure which may ruin a motor.

## A Stunt Which Prevents Power Line Failures

Permanent line construction in these days necessitates the use of steel poles and crossarms. However, wood poles and wood crossarms are quite extensively used and thoroughly practicable. One of the greatest difficulties in the past has been due to the use of the same type and size insulators on steel crossarms and poles as were formerly used on wood poles and wood crossarms carrying the same voltage. It is quite obvious that short circuits and grounds are more likely to occur with steel poles which conduct electricity readily than with wooden ones which, when dry, do not.

### ONE BRACE PREVENTS LEAKS

A three-phase line on a wood pole is sometimes no better than the same line when mounted on steel members. The reason for this is that it is common practice to use iron braces on the crossarms and attach them close to the insulator pins. When this is done it is obvious that there is a metallic circuit almost directly from the insulator pin to the crossarm braces then to the other insulator pin on the same crossarm. To prevent such a circuit being formed it may be found advantageous



### Long Leakage Path Prevents Short Circuit

The left-hand crossarm brace on this pole was eliminated to prevent leakage of current from one of the top line wires to the crossarm braces and thence to the other top wire.

to use only one crossarm brace placing it on one side of the pole. This brace should be a heavy one. With this arrangement the current may leak along this crossarm brace to the pole but thereafter it would have to travel along a highly resistant path through the wood of the pole and the crossarm to reach either one of the other two line wires. By this method the liability to breakdowns on almost any wood-pole line can be greatly decreased at low cost. As the voltage on certain lines is raised to carry larger loads it is often inconvenient and expensive to change insulators. The plan suggested may obviate that necessity.





## Problems In Underground Management



### Explains Why Water of High Sulphur Content Causes Pump Failures

Coal-Mining Company's Experiments Indicate Six-Stage Pumps with Glycometal Impellers, Resist Acid—Centrifugal Action Separates Acid from Water

By J. S. O'FLAHERTY  
Chief Engineer, Central Coal & Coke Co.,  
Kansas City, Mo.

Some of the experiences of the company with which I am connected, in handling mine water heavily impregnated with sulphuric acid, may be of interest to other coal operators as well as to metal miners and pump manufacturers. In many operations the expense of handling sulphur water is one of the larger items entering into the cost of producing coal or other mineral.

In 1912 my company purchased two centrifugal pumps intended to perform certain specific work in a mine in Oklahoma. The water in this mine had a high sulphur content and the cost of pumping and of pump maintenance was excessive. One of these pumps was a three-stage machine while the other had four-stages. In both pumps the impellers were of bronze, and the casings were made of acid-resisting metal selected from samples submitted for test by some of the largest and most reliable pump builders in the country.

All tests of this metal were conducted in both standing and running water in the mine in which the pumps were to operate. When these machines were purchased it was the intention to operate them under different heads in different locations in the mine. Through a change in plan, however, they were installed side by side, pumping out of one drill hole, each pump working a 12-hr. shift. In the course of time the shell of the three-stage pump was destroyed by the action of the acid water. Having portions of the pump still in good order yet on hand, sufficient repairs were ordered to again put the machine in good condition. The shell of the four-stage pump was still in good shape when the second casing of the three-stage pump was practically gone.

For a while I was of the opinion that a better grade of acid-resisting metal had been used in the four-stage pump. The two machines, however, were operating at the point for which the three-stage unit had been specifically designed. In time it occurred to us that the number of stages in the pump might have something to do with its life. Further experimentation proved this to be the case.

We now use a six-stage pump under

the conditions where formerly we would have used a three-stage machine. Furthermore, by using impellers made of glyco metal we have imparted indefinite life to our pumps when handling the same water that formerly caused no end of trouble.

My explanation of this is as follows: Sulphuric acid is comparatively heavy, having a specific gravity of 1.849; consequently the impellers act as separators, concentrating the sulphuric acid against the shell or casing. As a result the slower the rotational speed the less the separation of water from the acid, and the greater the number of stages the less the velocity of the water.

Chemists to whom the above was shown state that the affinity between sulphuric acid and water is so strong that the two liquids cannot be separated or the acid content appreciably concentrated by centrifugal action.

Perhaps some *Coal Age* reader has had experience similar to that above related and can explain this phenomenon.—  
EDITOR.

### At Crossover Double Rail Lifts False Flange Above Track Rail Being Crossed

Where the Fourth East entry crosses the Second Main South haulageway in the Springdale mine of the Allegheny Pittsburgh Coal Co., Logans Ferry, Pa., a substantial crossover has been laid which possesses at least one feature worthy of note. Beside the usual crossover rails, on which the wheels of rolling stock run, and guard rails to insure safety to a trip in passing the junction, an outer rail is matched with each of the track rails in the crossover as shown in the accompanying illustration. These outer rails are placed close to the track rails. The balls of both rails touch each other and lie in the same plane.

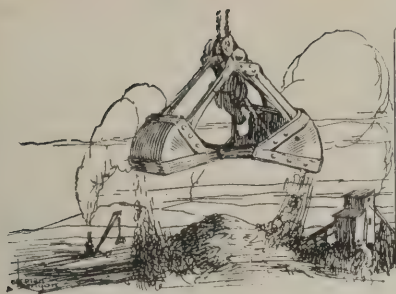
Each end of the outer rails is tapered in the vertical plane to form a slight incline which gently lifts false-flanged wheels of rolling stock up and over the track rails being crossed, thus eliminating violent impacts between the false flanges of the wheels and the rails being crossed. The outer rails form a track in the crossover on which the unworn parts of wheels run,



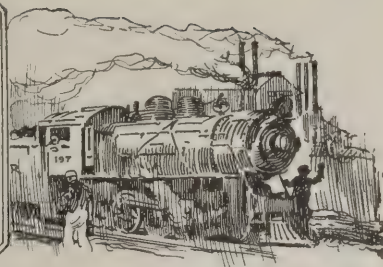
#### Stilling the Cry, "They're Off at the Crossover Again"

Wheel treads are made wide for safety. If they weren't wide cars would leave the track at any point where the distance between the rails greatly exceeded the gage. But that widening of the tread unfortunately gives it an unworn exterior area, and at this crossover an extra rail is placed so that this unworn area supports the wheel, lifting the worn area clear of the rails being crossed.





# Production And the Market



## Coal Business Has Fleeting Revival of Interest With Fall in Temperature

A partial sop to the justly disgruntled coal trade came along last week in the guise of a blast of rough weather, but—the usual insect in the salve—while it was unusually severe it didn't last long enough. Therefore, although there was a sudden revival of interest in coal it subsided almost as quickly as it appeared and conditions resumed the listless aspect that had been in evidence for several weeks. The paradoxical wish of the coal industry still is for more weather—the worse the better. And unless a stretch of seasonable temperature puts in an appearance soon the producer will be up against it harder than ever with the end of the lake season close at hand and heavy tonnage to be deflected into other channels.

### Industrial Improvement Is Spotty

The era of prosperity expected to follow on the heels of the election has thus far fallen far short of prognostications. Though surveys of industrial conditions indicate an improvement, the pickup has not been sufficiently general—being quite spotty in fact—to give the impetus to business expansion that would pull the coal trade out of the rut. As New England industries have been conspicuously sluggish for some months more than ordinary interest attaches to the resumption of operations this week on full time by one of the large Fall River textile plants.

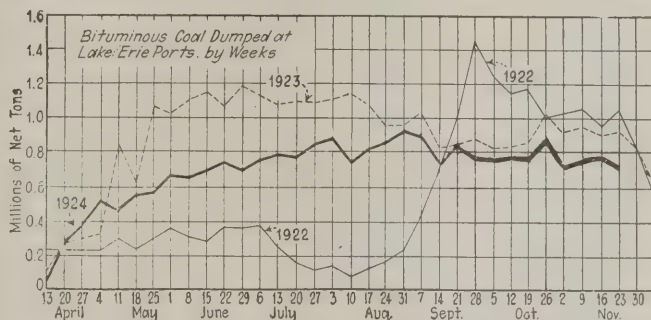
The anthracite trade felt the stimulus of more seasonable weather, especially the retail end—the producers scarcely needed it, as they have not entirely caught up on October orders. Stove is in greatest demand, except in Philadelphia, where chestnut has forged to the front. Egg and pea are listless and there is perhaps a slight improvement in the steam sizes. Independent prices show a firmer tendency with little material change in the range of quotations.

Coal Age Index of spot prices of bituminous coal at least is holding its own, standing on Nov. 24 at 170,

the corresponding price for which is \$2.06, the same as for the preceding two weeks.

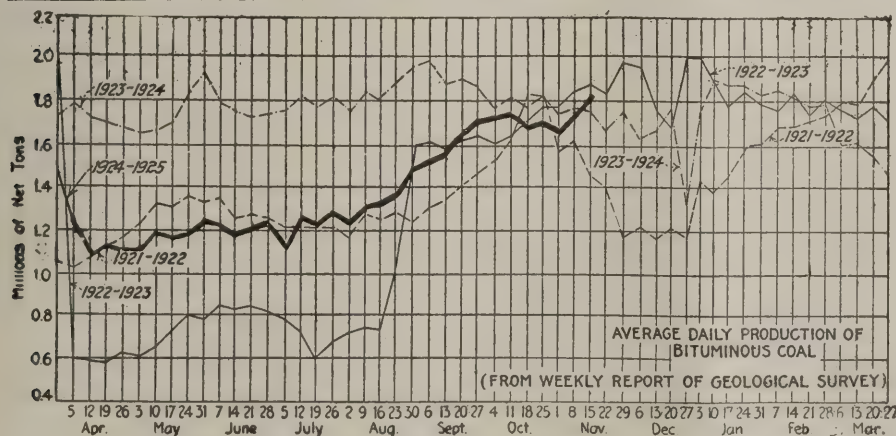
A further gain in activity was made at Hampton Roads last week, dumpings of coal for all accounts during the seven-day period ended Nov. 20 totaling 369,793 net tons, compared with 356,603 tons handled during the previous week.

Movement of coal across the lakes is unmistakably on the wane, dumpings at Lake Erie ports during the week ended Nov. 23, according to the Ore & Coal



Exchange, being as follows: For cargo, 704,930 net tons; for fuel, 28,698 tons, compared with 753,405 and 30,875 tons respectively during the preceding week.

Despite the celebration of Armistice Day, which cut operation about 40 per cent, the output of bituminous coal improved perceptibly in the second week of November, when, according to the Geological Survey, 10,122,000 net tons was produced. This was an increase of 791,000 tons over the preceding week, according to revised figures. Incidentally this is the first time since February that production has exceeded a corresponding week of 1923. Election Day tended to limit output of anthracite, but nevertheless 1,674,000 net tons was produced during the week ended Nov. 15, compared with 1,592,000 tons in the previous week and 1,669,000 tons in the corresponding week of 1923.



### Estimates of Production

(Net Tons)

#### BITUMINOUS

	1923	1924
Nov. 1.....	10,547,000	10,064,000
Nov. 8 (a).....	10,726,000	9,331,000
Nov. 15 (b).....	9,717,000	10,122,000
Daily average.....	1,767,000	1,808,000
Cal. yr. to date (c).....	485,268,000	462,979,000
Daily av. to date.....	1,797,000	1,492,000

#### ANTHRACITE

Nov. 1.....	1,328,000	1,444,000
Nov. 8.....	1,903,000	1,592,000
Nov. 15.....	1,669,000	1,674,000
Cal. yr. to date (c).....	82,393,000	79,400,000

#### COKE

Nov. 8 (a).....	255,000	140,000
Nov. 15 (b).....	254,000	152,000
Cal. yr. to date (c).....	16,383,000	8,453,000

(a) Revised since last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.



### Midwest Feels Slight Pick-up

A little more business was available all along the line in Midwest markets during the week, though domestic coals have not started any climb worthy of cheers. Most producers are wary of overproduction and therefore the markets have not been flooded with anything. This firms up most coals. Steam sizes have stiffened a shade in and around Chicago and a further improvement is expected unless a cold snap of real iciness should induce a sudden heavy production of lump and egg. Smokeless domestics could not maintain their top of \$4.25 and sank to \$4, but there has been a steady mine-run trade even though the price never passes \$2. Anthracite is reasonably active throughout this territory despite keen oil competition.

Cool weather came along just in time to save the domestic prices in the southern Illinois field. All domestic sizes, with the exception of lump, were beginning to pile up and lump was slow at several mines, with the result that in one or two places lump prices were good but egg suffered and nut was a drag on the market. Railroad tonnage is light, cars are plentiful and the movement is good. Mines are getting from two to four days a week and all coal has been moving under pressure.

In the Duquoin field conditions are similar to the above except that prices are weaker. Weather has been favorable and prices are such that Duquoin coal will move. In the

Mt. Olive field conditions have been unusually bad but cold weather has put a little life into that region's domestic trade. There is some domestic coal moving northwest and steam is pretty well taken up on contract with no change in prices. In the Standard field up to the present there has been no movement and conditions have been unusually bad, most coal being sold at below cost.

A little cold weather has spurred the St. Louis market just a trifle on cheap grades. There is nothing doing in anthracite, smokeless and coke. Carterville is moving rather freely but the small orders which are most numerous are for the cheaper grades. Country domestic demand for Mt. Olive or better grades is fairly active. Local wagon-load steam is very good, while carload steam is soft and with little demand. Country steam is rather hard to find, with nothing moving out of the Chicago market.

### Better Omens in Kentucky

Demand for Kentucky coal over the week has been fair, but offerings at Louisville have been heavier due to larger tonnage production in western Kentucky and slumping off of Lake movement from West Virginia and eastern Kentucky. Retailers haven't been moving much yard stock because of mild weather and are refusing to buy. The result has been that there is a good deal of prepared coal on track in western Kentucky awaiting billing. Eastern Ken-

### Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern		Market Quoted	Nov. 26 1923	Nov. 10 1924	Nov. 17 1924	Nov. 24 1924
Smokeless lump.....	Columbus...	\$4.10	\$4.35	\$4.10	\$4.00@	\$4.50
Smokeless mine run.....	Columbus...	2.10	2.05	2.00	1.75@	2.25
Smokeless screenings.....	Columbus...	1.30	1.35	1.25	1.20@	1.35
Smokeless lump.....	Chicago...	4.50	4.60	4.10	3.75@	4.00
Smokeless mine run.....	Chicago...	2.25	1.85	1.85	1.75@	2.00
Smokeless lump.....	Cincinnati...	4.25	3.85	3.75	3.75@	4.25
Smokeless mine run.....	Cincinnati...	2.10	1.90	1.85	1.75@	2.00
Smokeless screenings.....	Cincinnati...	1.50	1.15	1.15	.75@	1.15
*Smokeless mine run.....	Boston...	4.65	4.30	4.30	4.20@	4.35
Clearfield mine run.....	Boston...	2.15	1.95	1.90	1.65@	2.25
Cambria mine run.....	Boston...	2.60	2.40	2.30	2.00@	2.60
Somerset mine run.....	Boston...	2.35	2.15	2.05	1.80@	2.35
Pool 1 (Navy Standard).....	New York...	3.00	2.75	2.75	2.65@	3.00
Pool 1 (Navy Standard).....	Philadelphia...	3.00	2.70	2.70	2.50@	2.90
Pool 1 (Navy Standard).....	Baltimore...		2.30	2.30	2.10@	2.50
Pool 9 (Super. Low Vol.).....	New York...	2.35	2.10	2.10	2.00@	2.25
Pool 9 (Super. Low Vol.).....	Philadelphia...	2.30	2.15	2.15	1.95@	2.35
Pool 9 (Super. Low Vol.).....	Baltimore...	2.05	1.70	1.70	1.65@	1.80
Pool 10 (H.Gr.Low Vol.).....	New York...	2.00	1.85	1.85	1.75@	2.00
Pool 10 (H.Gr.Low Vol.).....	Philadelphia...	1.85	1.75	1.75	1.65@	1.90
Pool 10 (H.Gr.Low Vol.).....	Baltimore...	1.90	1.55	1.55	1.50@	1.65
Pool 11 (Low Vol.).....	New York...	1.55	1.60	1.60	1.50@	1.75
Pool 11 (Low Vol.).....	Philadelphia...	1.70	1.45	1.45	1.35@	1.60
Pool 11 (Low Vol.).....	Baltimore...	1.75	1.45	1.45	1.40@	1.50
High-Volatile, Eastern		Market Quoted	Nov. 26 1923	Nov. 10 1924	Nov. 17 1924	Nov. 24 1924
Pool 54-64 (Gas and St.).....	New York...	1.60	1.50	1.50	1.40@	1.65
Pool 54-64 (Gas and St.).....	Philadelphia...	1.65	1.50	1.50	1.40@	1.60
Pool 54-64 (Gas and St.).....	Baltimore...	1.70	1.45	1.45	1.40@	1.50
Pittsburgh s'd gas.....	Pittsburgh...	2.55	2.40	2.40	2.30@	2.50
Pittsburgh gas mine run.....	Pittsburgh...	2.25	2.10	2.10	2.00@	2.25
Pittsburgh mine run (St.).....	Pittsburgh...	2.00	1.85	1.85	1.75@	2.00
Pittsburgh slack (Gas).....	Pittsburgh...	1.25	1.15	1.15	1.10@	1.25
Kanawha lump.....	Columbus...	3.00	2.55	2.55	2.35@	2.75
Kanawha mine run.....	Columbus...	1.85	1.55	1.55	1.45@	1.65
Kanawha screenings.....	Columbus...	.80	1.00	.95	.80@	1.00
W. Va. lump.....	Cincinnati...	3.15	2.60	2.65	2.35@	3.00
W. Va. gas mine run.....	Cincinnati...	1.50	1.45	1.45	1.35@	1.50
W. Va. steam mine run.....	Cincinnati...	1.50	1.30	1.35	1.35@	1.50
W. Va. screenings.....	Cincinnati...	.85	.95	.95	.75@	1.25
Hooking lump.....	Columbus...	2.95	2.55	2.55	2.35@	2.75
Hooking mine run.....	Columbus...	1.85	1.60	1.60	1.50@	1.75
Hooking screenings.....	Columbus...	.80	.75	.75	.75@	.90
Pitts. No. 8 lump.....	Cleveland...	2.55	2.30	2.40	1.90@	2.75
Pitts. No. 8 mine run.....	Cleveland...	1.95	1.75	1.85	1.80@	1.90
Pitts. No. 8 screenings.....	Cleveland...	1.15	1.00	1.10	1.10@	1.30
Midwest		Market Quoted	Nov. 26 1923	Nov. 10 1924	Nov. 17 1924	Nov. 24 1924
Franklin, Ill. lump.....	Chicago...	\$4.10	\$3.35	\$3.35	\$3.25@	\$3.50
Franklin, Ill. mine run.....	Chicago...	2.35	2.35	2.35	2.25@	2.50
Franklin, Ill. screenings.....	Chicago...	1.45	1.35	1.35	1.35@	1.60
Central, Ill. lump.....	Chicago...	3.10	2.85	2.85	2.75@	3.00
Central, Ill. mine run.....	Chicago...	2.10	2.20	2.20	2.15@	2.25
Central, Ill. screenings.....	Chicago...	1.05	1.25	1.25	1.25@	1.35
Ind. 4th Vein lump.....	Chicago...	3.35	3.10	3.10	3.00@	3.25
Ind. 4th Vein mine run.....	Chicago...	2.60	2.35	2.35	2.25@	2.40
Ind. 4th Vein screenings.....	Chicago...	1.35	1.45	1.45	1.50@	1.60
Ind. 5th Vein lump.....	Chicago...	2.50	2.85	2.85	2.50@	3.00
Ind. 5th Vein mine run.....	Chicago...	2.10	2.10	2.10	2.00@	2.25
Ind. 5th Vein screenings.....	Chicago...	.95	1.10	1.10	1.10@	1.35
Mt. Olive lump.....	St. Louis...	3.10	3.00	3.00		3.00
Mt. Olive mine run.....	St. Louis...	2.25	2.35	2.35	2.25@	2.50
Mt. Olive screenings.....	St. Louis...	1.25	1.10	1.10	1.00@	1.25
Standard lump.....	St. Louis...	3.05	2.75	2.75		2.75
Standard mine run.....	St. Louis...	2.05	1.95	1.95	1.90@	2.00
Standard screenings.....	St. Louis...	.55	.60	.65	.60@	.75
West Ky. lump.....	Louisville...	3.00	3.05	3.05		3.00
West Ky. mine run.....	Louisville...	1.75	1.60	1.60	1.50@	1.75
West Ky. screenings.....	Louisville...	.65	.70	.80	.85@	1.00
West Ky. lump.....	Chicago...	2.85	2.75	2.75	2.50@	3.00
West Ky. mine run.....	Chicago...	1.75	1.65	1.55	1.40@	1.70
South and Southwest		Market Quoted	Nov. 26 1923	Nov. 10 1924	Nov. 17 1924	Nov. 24 1924
Big Seam lump.....	Birmingham...	3.85	3.10	3.10	2.75@	3.50
Big Seam mine run.....	Birmingham...	1.95	1.70	1.70	1.50@	1.90
Big Seam (washed).....	Birmingham...	2.35	1.85	1.85	1.75@	2.00
S. E. Ky. lump.....	Chicago...	3.25	2.85	2.75	2.50@	3.00
S. E. Ky. mine run.....	Chicago...	1.85	1.60	1.60	1.50@	1.75
S. E. Ky. lump.....	Louisville...	3.50	3.25	3.25	2.75@	3.25
S. E. Ky. mine run.....	Louisville...	1.85	1.60	1.60	1.50@	1.75
S. E. Ky. screenings.....	Louisville...	.75	.90	.95	.85@	1.00
S. E. Ky. lump.....	Cincinnati...	2.60	2.60	2.75	2.50@	3.00
S. E. Ky. mine run.....	Cincinnati...	1.50	1.45	1.45	1.25@	1.65
S. E. Ky. screenings.....	Cincinnati...	.85	1.00	.95	.75@	1.15
Kansas lump.....	Kansas City...	5.10	5.00	5.00		5.00
Kansas mine run.....	Kansas City...	3.25	3.35	3.35	3.25@	3.50
Kansas screenings.....	Kansas City...	2.00	2.00	2.00	2.25@	2.35

\* Gross tons, f.o.b. vessel, Hampton Roads.

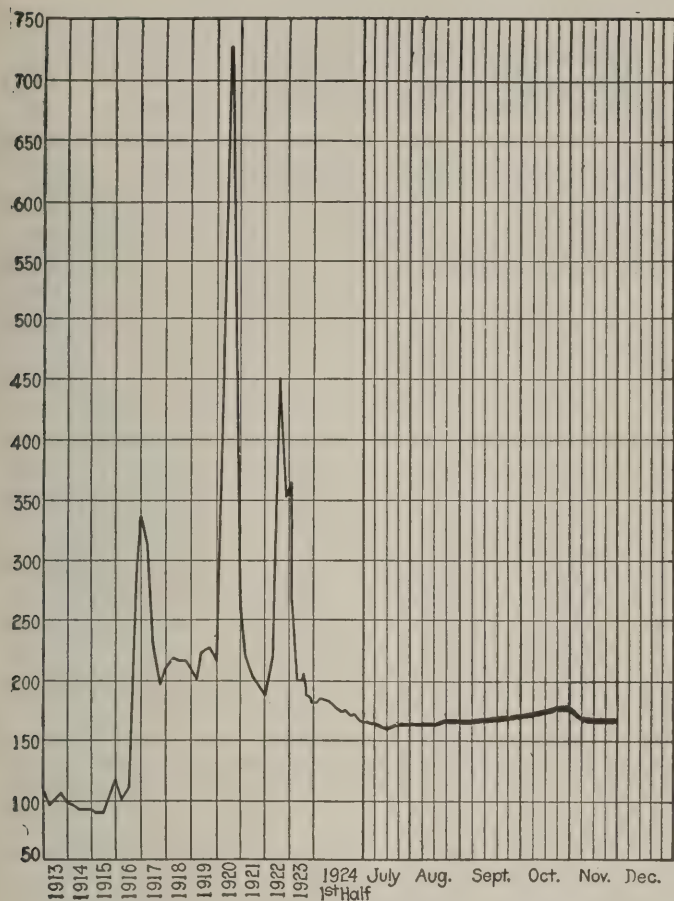
† Advances over previous week shown in heavy type, declines in italics.

### Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

		Market Quoted	Freight Rates	Nov. 26, 1923		Nov. 17, 1924		Nov. 24, 1924†	
				Independent	Company	Independent	Company	Independent	Company
Broken.....	New York.....		\$2.34	\$8.50@	\$10.00	\$8.00@	\$9.25		
Broken.....	Philadelphia.....		2.39						
Egg.....	New York.....		2.34	9.85@	12.25	8.75@	9.25		
Egg.....	Philadelphia.....		2.39	9.85@	12.20	8.75@	9.25		
Egg.....	Chicago*.....		5.06	9.60@	12.50	8.00@	9.35		
Stove.....	New York.....		2.34	9.85@	12.25	8.75@	9.25		
Stove.....	Philadelphia.....		2.39	9.85@	12.20	8.90@	9.25		
Stove.....	Chicago*.....		5.06	9.60@	12.50	8.00@	8.35		
Chestnut.....	New York.....		2.34	9.85@	12.25	8.75@	9.25		
Chestnut.....	Philadelphia.....		2.39	9.85@	12.20	8.90@	9.25		
Chestnut.....	Chicago*.....		5.06	9.60@	12.50	8.00@	8.35		
Pea.....	New York.....		2.22	6.40@	7.75	6.15@	6.65		
Pea.....	Philadelphia.....		2.14	6.75@	9.00	6.35@	6.60		
Pea.....	Chicago*.....		4.79	6.00@	6.75	5.40@	6.05		
Buckwheat No. 1.....	New York.....		2.22	1.75@	3.50		3.50		
Buckwheat No. 1.....	Philadelphia.....		2.14	2.25@	3.50		3.50		
Rice.....	New York.....		2.22	1.25@	2.50	1.75@	2.15		
Rice.....	Philadelphia.....		2.14	1.75@	2.50	2.00@	2.25		
Barley.....	New York.....		2.22	.90@	1.50	1.25@	1.50		
Barley.....	Philadelphia.....		2.14	1.00@	1.50	1.50	1.50		
Birdseye.....	New York.....		2.22	1.25@	1.45		1.60		

\* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.





Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

	1924		1923	
	Nov. 24	Nov. 17	Nov. 10	Nov. 26
Index .....	170	170	170	186
Weighted average price .....	\$2.06	\$2.06	\$2.06	\$2.25

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke; 1913-1918," published by the Geological Survey and the War Industries Board.

tucky also has unsold coal on track and has been active in an effort to move egg and 2-in. lump sizes.

Steam demand has been fair for screenings, but not much mine run is being taken, although total industrial movement has been good since election.

Of course there is a fair movement to retailers in the North, who are getting more cold weather. However, prices are a shade weaker on prepared. There is very little eastern Kentucky block quoted at over \$3.25, and not much sold at over \$3, while some good coal has been offered at \$2.75. Western Kentucky is still asking \$3 for block, but the price is being shaded.

Screenings are firmer as a result of lighter production of prepared. The western Kentucky field has advanced to 85c.@\$1 a ton quoted, and supplies are said to be scarce at these prices. Some screenings in eastern Kentucky are quoted at 85c. but most houses are asking 95c.@\$1.10.

### Northwest Is Busy

Stocks of coal on docks at Nov. 1, according to figures just released, give an accurate picture of the condition at Head of the Lakes. This year the docks hold 4,751,352 tons of bituminous as against 5,369,529 last year at the same time, and 543,340 tons of anthracite as against 138,982 last year. Obviously the bituminous market will not be glutted this year and the anthracite now on hand will assure the Northwest that there will be no shortage.

Only one cargo of anthracite was received last week and at the same time 36 cargoes of bituminous came in. Twenty-three cargoes are reported en route and one of these is anthracite.

The feature of the Head-of-the-Lakes market still is Pocahontas. The demand is insistent and several docks have received additional cargoes to help out. The price took another jump in lump this week and now stands at \$9. With the jump, however, mine run remains at \$5.50 and screenings at \$4.50. Pocahontas lump was \$7 for October. Other prices, both in hard and soft coal, remain the same.

Docks are on the jump and are working overtime to get shipments out. Last month, it will be remembered, was the biggest so far this year, and this month bids fair to pass it. One dock is two weeks behind in its orders.

At Milwaukee a drop in temperature during the week, with snow as a reminder of conditions soon to be expected as a matter of course, caused a betterment in the inflow of orders for fuel for a day or two, but things snapped back with a rise of the mercury, and dealers report a quiet market. There has been some improvement in getting stock from the mines, which have been catching up because of slower demand. Pocahontas has been advanced in price 25c. to 50c. a ton, the latter advance on the nut size. The Milwaukee retail price is now \$11.25@ \$11.50.

Milwaukee receipts during November, including the 19th, were 23,500 tons of anthracite and 283,235 tons of bituminous coal, making the season's totals thus far 716,794 tons of anthracite and 2,346,609 tons of bituminous coal, or 3,063,403 tons in all. Receipts for the same period of 1923 were 862,324 tons of anthracite and 3,000,162 tons of bituminous coal—3,862,486 tons in all.

### Western Domestic Is Slow

Kansas screenings, which have been selling several weeks at \$2, are quoted at \$2.25@ \$2.35 now. The surplus of this grade which accumulated during the early season period of heavy domestic demand has been moved and it is now the domestic sizes that are dragging, with mines working only about half time. Production in Arkansas and Oklahoma also is very light, the result of warm weather.

A slight stimulation in the production of domestic coals was noted in the Colorado market during last week, but not to such an extent as one familiar with previous seasons would expect for this time of the year. The remarkably warm weather prevailing throughout Colorado and the regions where Colorado coal is marketed is puzzling others than the weather man. However, Colorado mines worked on an average of 31 hours last week with only 18 per cent of the total working time lost on account of "no market." Prices are firm.

In Utah production is increasing as a result of colder weather. The best industrial customer is the metal mining industry. The sugar making campaign fell nearly 40 per cent short of normal and there may be some surplus coal left in sugar factory yards. Northwestern business is improving and the California trade is holding up well. Dealers, who have already moved a good deal of coal to householders' cellars, are not buying heavily at the moment.

### Ohio Markets Lack Vim

Sales of coal in the Cincinnati market have fallen off materially during the last week, in spite of the active movement of lake coal in winding up the season. There has been a slight increase of steam and byproduct orders, but a large falling off of domestic orders. Most retail yards are full, but the colder weather of the last week served to relieve them a good deal. The off situation has been marked by the reappearance of distress coal, though not to an amount to prove demoralizing. Many mines have had to shorten production and available mine tracks are full of loaded cars. Mine-run both in low and high volatile continues to drag in the West, which is customarily its best market, but this condition, due to earlier overshipment, is only temporary. The tidewater demand for smokeless mine-run continues off and the price is below the profit-making point. West Virginia and Kentucky operators have had notice that final shipments on outstanding orders for lake coal must be made on or before Nov. 26.

While colder weather has stimulated retail trade at Columbus, no effect is noticed in production and distribution. Smokeless and splints are rather strong at former levels, but Hocking, Cambridge and Pomeroy coals are weak and featureless. Prices have not moved to any extent. Steam business is rather dull, reserves are fairly good and buying is mostly from the open market, as demurrage coal is still rather plentiful. General manufacturing has not increased to any extent. Screenings are slightly stronger as a result



of reduced output of prepared sizes. Production is not large in any section of the southern Ohio field.

At Cleveland there has been a marked stiffening in spot prices on slack and nut and slack of 10c.@15c. per ton, the result of diminishing supply of these grades due to the cessation of production for shipment in the Lake trade and the further fact that steam users did little stocking when slack was plentiful.

### Demand Slightly Better at Pittsburgh

Demand has been improving slowly at Pittsburgh since the election, but not enough to make up for the previous lull without a corresponding decrease in production. Railroad consumption is good, but stocking is below normal. The steel mills are now running a trifle above their average in the past six years. Domestic coal demand has been poor for this time of year, due to mild weather, and prices have failed to stiffen. Nut is particularly hard to dispose of and slack is in unsatisfactory demand, but steam slack has avoided falling below \$1.

A slightly better tone pervades the central Pennsylvania coal market since the election. Orders are increasing slightly and although production has been slightly lower this is accounted for by four holidays during the month, when many miners were off duty. Output for the week ending Nov. 15 was 14,243 carloads, compared with 14,436 carloads the previous week.

Trade at Buffalo continues quiet with prices no higher. The steel trade has improved a little and business is in a healthy condition. The movement of coal is very free. Cars are not at all hard to get and they arrive at destination promptly. A sudden cold snap improved buying a little, but it lasted only two or three days. Quotations are as before, with a slight stiffening in slack.

### New England Markets Listless

In New England buyers seem almost wholly without interest in the current market and prices are again somewhat depressed in consequence.

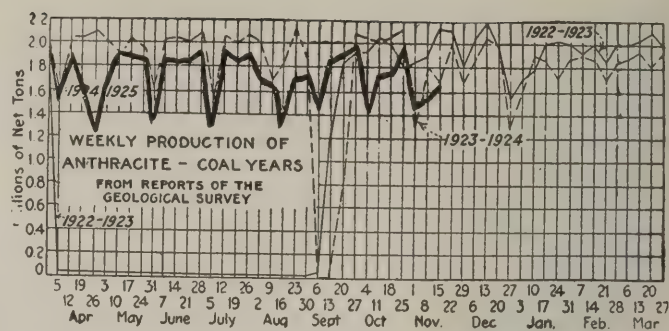
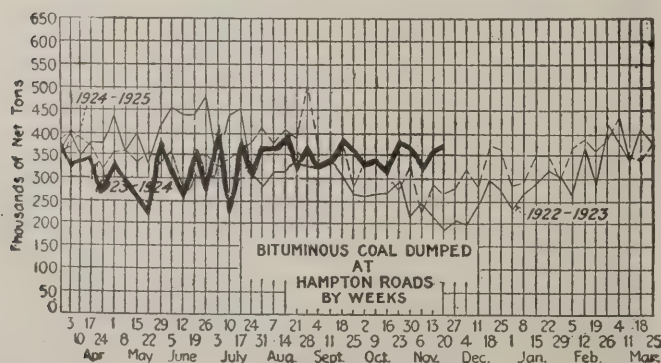
The Hampton Roads situation seems to have entirely lost the favorable tone that was noticed a few weeks ago. Prices f.o.b. vessel have again slipped to lower averages, \$4.20 having been mentioned in the past week for navy acceptable grades f.o.b. vessel. The recent sale of locomotive supply coal by the Island Creek interests to New England railroads in considerable volume, displaying a large tonnage of high volatile from other districts in West Virginia, and has occasioned much comment.

For inland delivery high grade Pocahontas and New River are an easy purchase at \$5.35@\$5.40 per gross ton on cars Boston, with Providence and Portland prices 15c.@35c. higher, depending upon the urgency of sale. This situation continues to exclude even the highest grades all-rail from central Pennsylvania.

Dumpings via the New York and Philadelphia piers are at a minimum. The tonnage is not only relatively small but is confined almost exclusively to gas-producing coals and other specialties that in the main are unaffected by competition of the smokeless coals from Southern ports.

### Signs of Life Appear in Atlantic Markets

A little more activity has appeared in the New York market. Buyers are inclined to display a little more interest and coal movement is somewhat better than last week. Contract holders are more anxious about their full quota and there is not so much free coal available as a result. Not



much improvement is looked for, however, until after Jan. 1. Arrivals at tidewater continue to increase but shippers appear to be able to dispose of the surplus without much trouble. Quotations continue on last week's basis.

Colder weather has stirred up interest in the Philadelphia market, though buying has not increased much. Ordering on contracts is heavier and there is some storing for winter. Offering of slack has fallen off slightly but demand from retailers has increased. There is not much life at tide.

At Baltimore there has been no response by coal buyers thus far to the prosperity talk. Prices remain at points that bring little, if any, profit to producers, and offer little incentive for sales work by jobbers. On several days of the past week there was not more than one vessel at any time at the piers taking export coal.

Birmingham trade is devoid of much activity. Such seasonal industries as oil mills and steam electric plants are the principal buyers in the spot market, there being little increase in the tonnage taken by year-round industries as compared with recent weeks. Railroads are taking minimum deliveries on contracts and apparently no buyers on contract are increasing reserves. Domestic sales are confined to orders for a few cars for shipment here and there over the territory. Quotations are fairly steady and but little domestic or steam is produced in advance of disposition.

### Spurt in Anthracite Market Short-Lived

There was a slight revival in the anthracite market at New York early in the week, but it did not last long. Lower temperatures caused a sudden spurt in demand on the retailers, which was reflected in the wholesale trade, but bins were soon refilled. Independent prices steadied with the increased demand, but the range doesn't show any material change. Stove leads in demand, but egg and pea move slowly. The situation of the steam sizes has not changed. Early in the week some shippers offered egg coal at tidewater on a basis of \$8.25 per ton at the mines, but this was soon cleaned up.

Unusually cold weather at Philadelphia has caused a strong retail demand, but producers hardly needed a stimulant of this kind, as they have not altogether caught up with orders. Stove and nut are most in demand, with the latter now in the ascendant. Egg is giving more trouble than pea. Retail prices have strengthened. Steam sizes are in much better demand.

Demand is only moderate at Baltimore although spurred into some action by a cold snap during the week. Much is hoped for as a result of the drive about to be started to educate the people to burn buckwheat coal. Yards are fairly well stocked to meet all demands.

At Buffalo the demand for anthracite has been helped materially by colder weather and retailers are really busy for the first time since last winter. Consumers are still seeking substitute fuel, however. The latest is a shipment of blue star semi-anthracite from southern West Virginia. The price is \$4 to \$5 below anthracite, but the coal carries considerable volatile, though it is claimed that it is much above regular anthracite in heat units and lower in sulphur and ash.

### Car Loadings, Surpluses and Shortages

	Cars Loaded	
	All Cars	Coal Cars
Week ended Nov. 8, 1924.....	994,504	171,985
Previous week.....	1,073,430	181,718
Week ended Nov. 10, 1923.....	1,036,221	190,587
	Surplus Cars	
	All Cars	Coal Cars
Nov. 7, 1924.....	116,448	60,097
Oct. 31, 1924.....	99,190	49,058
Nov. 7, 1923.....	31,955	12,567
		Car Shortage
		7,099
		1,120



## Foreign Market And Export News

### Business in British Market Improving But Still Below Normal

The improving tendency in the South Wales market is patchy, and the recent heavy gales have disorganized shipping, holding up consignments and causing more stoppages at the pits. The sale of 300,000 tons of best admiralty coal to prominent Italian exporters for 1925 delivery at 26s. f.o.b. is reported from Cardiff. On the whole, however, foreign demand is disappointing. Complaints of German competition are unabated, and it is reported that Germans are giving three to six months credit against the thirty days offered in the South Wales market. Several other collieries are reported on the verge of stopping.

Several contracts have been renewed, among them that with the Somerset and Dorset Joint Railway for 1,000 tons of coal per week for the next year. Several other smaller contracts have

been placed and others renewed, but in no case is the price revealed, which leads to the impression that prices now are below those of expiring contracts.

The Newcastle market has improved very slightly, though operators are finding difficulty in meeting German competition; British prices, though at their very lowest, are still about one dollar per ton above the German figures. None of the pits has reopened, and, according to the principal of one large group in north England, there is every prospect of further stoppages unless business improves.

A cable to *Coal Age* states that production at the British collieries increased in the week ended Nov. 8, when the output was 5,137,000 tons, according to the official reports. This compares with 5,043,000 tons in the week ended Nov. 1.

### French Markets at Standstill; Stocks Unimportant

The French coal market remains in a sort of privileged position in that while Belgian supplies of industrial coal are excessive, French stocks of corresponding grades are just normal and those of house fuels practically nil. Demand for industrial coal is limited and that for house fuel, active at the end of October, is at a momentary lull due to unusually mild weather.

Imports of Cardiff-Swansea and Newport coals fell away in October to 667,000 tons, compared with 1,008,000 tons in the corresponding month of 1923. This was due partly to the further appreciation of sterling, firmness of prices at the shipping docks and receipts of fuels from Germany.

German reparation deliveries having virtually stopped since Oct. 28, when the M.I.C.U.M. retired from office, a meeting of French, Belgian and Italian representatives with delegates of the German mines and cokeries was held in Paris under the auspices of the Reparation Commission and an agreement was

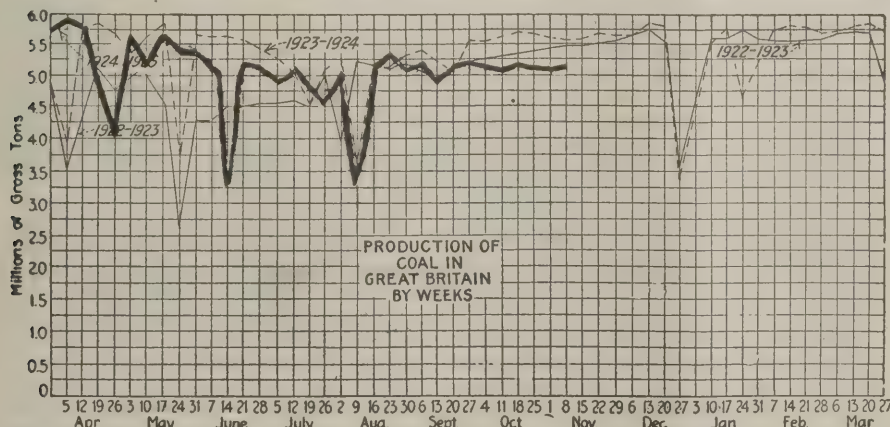
quickly arrived at. The apportionment of reparation fuels to the Allies will be fixed by the Reparation Commission, France's share to be about 600,000-650,000 tons per month dating from November.

The supply of coke to the O.R.C.A. in October was 269,805 tons, of which 11,555 tons was received during the last two days of the month. From Nov. 1 to 12, 6,746 tons was received.

### U. S. Domestic Fuel Exports In October

(In Gross Tons)

	1923	1924
Anthracite, tons.....	400,599	362,118
Value.....	\$4,437,241	\$4,109,348
Bituminous coal, tons.....	1,488,887	1,534,459
Value.....	\$7,516,221	\$6,801,630
Coke, tons.....	77,737	55,759
Value.....	\$744,987	\$420,927
Ten Months Ended October		
Anthracite, tons.....	3,846,392	2,985,222
Value.....	\$41,736,118	\$33,220,615
Bituminous coal, tons.....	16,823,508	13,196,946
Value.....	\$92,823,649	\$61,230,545
Coke.....	1,010,456	475,171
Value.....	\$10,978,978	\$4,009,974



### Trade Slow at Hampton Roads; Price Tendency Firmer

Business at Hampton Roads is slow, although prices show a tendency to stiffen, due to the advent of winter weather. Inquiries have increased somewhat and prospects are brighter.

Coastwise business has improved and bunker movement is good, but practically no foreign business is being booked. Little prospect for increase in the latter trade is seen. Coastwise movement is expected to increase rapidly and the bunker trade has every indication of continuing upward.

The tone of the market is firm. Though few contracts are in the market, domestic business was improved on substantial lines. Supplies at tidewater have improved somewhat.

### Export Clearances, Week Ended Nov. 22, 1924

#### FROM HAMPTON ROADS

For Brazil:	Tons
Nor. Str. Mathilda, for Rio de Janeiro	4,937
For Cuba:	
Br. Str. Omega, for Havana	4,139
For Italy:	
Ital. Str. Campania, for Porto Ferrajo	6,607
For Mexico:	
Amer. Schr. Rosa Ferita, for Manzanillo	916
For Porto Rico:	
Nor. Str. Cissy, for Guayabal	3,030
For West Indies:	
Br. Str. Portmore, for Fort de France	4,255

#### FROM PHILADELPHIA

For Cuba:	
Am. Motorship Munmotor, for Havana	—

#### FROM BALTIMORE

For Italy:	
Ital. Str. Hermada, for Genoa	6,452

### Hampton Roads Pier Situation

N. & W. Piers, Lamberts Pt.:	Nov. 13	Nov. 20
Cars on hand.....	949	1,229
Tons on hand.....	58,587	75,403
Tons dumped for week.....	117,017	95,985
Tonnage waiting.....	4,000	20,000
Virginian Piers, Sewalls Pt.:		
Cars on hand.....	1,706	1,984
Tons on hand.....	113,550	129,900
Tons dumped for week.....	109,911	94,492
Tonnage waiting.....	12,000	8,395
C. & O. Piers, Newport News:		
Cars on hand.....	2,220	1,554
Tons on hand.....	116,770	86,575
Tons dumped for week.....	91,468	135,696
Tonnage waiting.....	19,510	3,950

### Pier and Bunker Prices, Gross Tons

PIERS			
		Nov. 15	Nov. 22†
Pool 9, New York...	\$4.75@	\$5.00	\$4.75@ \$5.00
Pool 10, New York...	4.50@	4.75	4.50@ 4.75
Pool 11, New York...	4.40@	4.55	4.40@ 4.55
Pool 9, Philadelphia...	4.90@	5.25	4.90@ 5.25
Pool 10, Philadelphia...	4.45@	4.70	4.45@ 4.70
Pool 11, Philadelphia...	4.30@	4.50	4.30@ 4.50
Pool 1, Hamp. Roads.		4.20	<b>4.25</b>
Pool 2, Hamp. Roads.		4.10	4.10
Pools 5-6-7 Hamp. Rds		4.00	4.00
BUNKERS			
Pool 9, New York...	\$5.00@	\$5.25	\$5.00@ \$5.25
Pool 10, New York...	4.75@	5.00	4.75@ 5.00
Pool 11, New York...	4.65@	4.80	4.65@ 4.80
Pool 9, Philadelphia...	4.90@	5.25	4.90@ 5.25
Pool 10, Philadelphia...	4.75@	4.95	4.75@ 4.95
Pool 11, Philadelphia...	4.50@	4.70	4.50@ 4.70
Pool 1, Hamp. Roads.		4.30	<b>4.35</b>
Pool 2, Hamp. Roads.		4.20	4.20
Pools 5-6-7 Hamp. Rds		4.10	4.10

### Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations by Cable to *Coal Age*

Cardiff:	Nov. 15	Nov. 22†
Admiralty, large...	27s. @ 27s. 6d.	27s. @ 27s. 6d.
Steam smalls.....	16s. @ 17s.	16s. @ 17s.
Newcastle:		
Best steams.....	18s. 3d. @ 18s. 6d.	18s. 3d. @ 22s. 6d.
Best gas.....	20s. @ 21s.	21s.
Best bunkers.....	18s. 6d. @ 19s.	18s. 6d. @ 19s. 1

† Advances over previous week shown in heavy type, declines in italics.





## News Items From Field and Trade



### ALABAMA

New coal washeries of medium capacity will be constructed by the Pratt Fuel Corporation at its drift mines at Dora and at its Jagger operation. The plants will cost about \$60,000 and \$20,000 respectively, according to announcement.

Frank Nelson, Jr., formerly president and principal owner of the Nelson Coal Corporation, and S. L. Yerkes, of the Grider Coal Sales Agency, who formerly operated the Burnwell Coal Mining Co., have been elected directors of the Pratt Fuel Corporation. The properties of the former two companies were absorbed by the latter a short while ago.

Walker County celebrated its 100th anniversary as a sub-division of the state recently at Jasper, Ala. A contest was held to determine what factor had contributed the most to the up-building and development of the county to its present position of wealth and influence and "Coal" was voted this distinction by the crowning of L. B. Musgrove, a pioneer developer in the Walker County field as "King."

The School of Mines at the State University, University, Ala., operated under the direction of the U. S. Bureau of Mines, is making an addition to its laboratory to accommodate new equipment recently acquired. A small coal washery has been donated to the school by the Montgomery Coal Washer & Mfg. Co., of Birmingham, and concentration tables and other equipment have been added to aid in the treatment and determination of coal samples.

The Joseph A. Holmes Safety Association, which has organized chapters throughout the Alabama coal fields, is conducting a campaign for the prevention of haulage accidents in the mines, it being stated that this class of accidents is responsible for about 16 per cent of the fatalities in the industry. Meetings are being held throughout the district, each being addressed on this subject by an official of the association or some representative of the Alabama mine inspection department or U. S. Bureau of Mines, which latter agencies are co-operating in all efforts being put forward for the prevention of accidents in mining operations.

### COLORADO

The State of Colorado produced 123,892 tons less coal during the first nine months of the year than it did in the same period of 1923.

The Chandler mine of the Victor-American Fuel Co. broke all its previous

monthly production records when it averaged nearly its maximum of 850 tons a day during October. This mine is in the Canon City field.

D. E. Davis, superintendent at Oak Creek for the Victor-American Fuel Co. in Routt County, is in California for a long vacation.

Colorado was not the most dangerous coal mining state in the Union during September. National statistics on coal-mine accidents for the month show 186 deaths for 48,624,000 tons produced, or a national fatality rate of 3.83 deaths per million tons of coal. Colorado's rate was but 3.20 for the month.

F. O. Sandstrom, secretary and traffic manager of the Colorado & New Mexico Coal Operators Association, and Harry F. Nash, vice-president of the Oakdale Coal Co., were in Washington, D. C., during the week of Nov. 17, representing the Colorado operators in the Missouri River rate case, which is at present before the Interstate Commerce Commission for final hearing. This case was filed by the Colorado operators in September, 1923, in order that the commission might eliminate the discrimination in the rates between Colorado fields and other producing districts to the Missouri River.

### ILLINOIS

The Peabody Coal Co. has reopened its mine No. 9, at Langley, which had been closed several months. It is expected that 500 men will be employed all winter.

Eighty men are on the payroll of the Rutland Coal mine, at Rutland, which was recently opened by Ottawa men. Rutland is now producing third vein coal.

The United Electric Mine Co., Danville, is negotiating for a large acreage north of Rushville, with a view to opening a big strip mine. Several options have been closed upon land and more are pending. The company is, now operating a mine between Cuba and Lewistown on the Galesburg-Havana branch of the Burlington, where it began taking out coal last February. The output of that mine is now thirty cars per day. The coal on the farms near Rushville, which are now under lease, is under from 30 to 40 ft. of cover. It averages 5 ft. in thickness.

Crescent Mine No. 1, in Marsh Creek Hollow, near Peoria, has begun operation on a half capacity basis after having been idle since March 29. This operation will give employment to 250

men. With the opening of this mine about 40 per cent of the miners in the Peoria territory are now employed. This is an increase of 30 per cent over the total employed sixty days ago.

The Tiger mine at Cuba, has resumed work after having been closed down for the last four months.

### INDIANA

Reports that the Vandalia Coal Co., operating some of the largest mines in Indiana, is experimenting with a "new process of mining," to which miners are taking exception, have been refuted by officials of District No. 11, United Mine Workers. "It is true the Vandalia Coal Co. is experimenting with the Joy loading machines, but the miners are not objecting to this," John Hessler, president of the miners, said.

### MISSOURI

A. Burt Champion, former vice-president of the Matthew Addy Co., has opened an office in St. Louis, where he will sell pig iron, coal, coke, charcoal, fluorspar and alloys.

### PENNSYLVANIA

The Shamokin Collieries Co., which is headed by Boyd C. Osler, formerly of Hazleton, is following the lines suggested by A. J. Jessup, general manager of the Jeddo-Highland Coal Co., and is going after the small sized coal trade.

To protect the new Fort Jenkins bridge at Pittston from damage by mine caves and settlement of the surface, the county commissioners have entered into an agreement with officials of the Pennsylvania Coal Co. for the purchase of the coal under the piers and abutments and for a certain radius beyond.

Consolidated Coal & Coke Co., of Butler, resumed operations Nov. 17 at its mines at Nicola, Armstrong County, after a shutdown since last April. Fifty men are employed. The company resumed operations at its Fennelton mines in Butler County three weeks ago.

Activity is increasing in the Connelville coke region. The Republic Iron & Steel Co. resumed operations last week at the Republic mine, which had been idle more than a year. No ovens are being fired but the mine will operate 100 per cent. The H. C. Frick Coke Co., however, fired 200 additional ovens at its Lamont plant. The Fayette Coal & Coke Co. has resumed



work at the Shamrock operation. The Linn plant of the American Coke Corporation, which was taken over at receivers' sale about a year ago by the Union Trust Co., resumed mining last week under the name of the American Coke & Fuel Co., of which George Batton, of Pittsburgh, is the head. The Snowdon Coke Co. has fired 100 more ovens.

The Cosgrove-Meehan Coal Corporation, of Johnstown, has contracted with the Roberts & Schaefer Co. for the installation of a Marcus screen and R. & S. loading booms at its new tippel at Foustwell.

Announcement has been made that Concrete City, the model settlement of the Glen Alden Coal Co. in the lower end of Hanover Township, is to be razed soon after Jan. 1. The tenants of the houses, who work at the various collieries of the company in the section, have been notified to vacate the premises not later than Dec. 1. Company officials say that the settlement is to be abandoned due to the action of the State Health Department in demanding that sewers be installed in the section, which would entail an expense of \$200,000.

Mine inspectors of the state are not employees within the meaning of the state administrative code, according to a decision rendered by William A. Schnader, special Deputy Attorney General. The ruling has just been given to P. S. Stahlnecker, secretary to Governor Pinchot and secretary of the state executive board. They are departmental administrative officers of the state, it is held.

An unusual set of lessons for use by Pennsylvania coal miners attending evening classes has just been completed at Pennsylvania State College, under the direction of N. E. Hubbel, associate professor of industrial education. The aim of the lessons is to prepare ordinary miners to take state examinations for official positions in mine work. Separate sets are to be used in the bituminous and the anthracite districts. The course requires two years of weekly class attendance during the winter

months. The lessons have been approved by the State Department of Mines and the State Department of Public Instruction. One thousand six hundred miners were enrolled last year and this year the number will exceed 2,000. The lessons have been made available at cost to those who cannot attend school.

To accommodate the large volume of coal which is hoisted daily at No. 4 slope, Alaska colliery of the Philadelphia & Reading Coal & Iron Corporation at Mount Carmel, a new high-powered electric engine is being installed at the head of the incline. A concrete engine house has already been built. On account of the immense size of the new engine a floor several feet deep has been placed. Hitherto three cars a trip were drawn to the top of the incline in ten minutes. With the high-powered engine it is expected that at least four cars will be drawn on each trip and it will take only two minutes.

The board of directors of the McKeesport Coal & Coke Co. has called a special meeting of its stockholders, to be held at its office, 1406 First National Bank Building, Pittsburgh, Dec. 2, at 2 p.m., for the purpose of (1) voting for or against an increase of the capital stock from \$1,200,000, to \$1,600,000, and (2) approving or disapproving of the creation, out of such increase of capital stock, of 2,000 shares of preferred stock of the par value of \$100 per share, entitled to receive a fixed yearly cumulative dividend of 7 per cent but no more, before any dividends be paid on the common stock.

By a decision of the State Supreme Court, it is ruled that mine owners "have no right of any kind to drain their mine waters into streams, considering the public use made of their waters, and that their so doing constitutes a nuisance which must be restrained." In the anthracite region the outlet for mine water has always been the creeks and rivers which flow through the sections where mining operations are conducted. The opinion was handed down in the case of the Pennsylvania R.R., the Mountain View Water Co. and other water companies

against a group of Fayette mine owners. Justice William I. Schaffer wrote the opinion. It provides that a pure water supply is a public necessity paramount to any other consideration.

Thomas J. Kennedy, president of district No. 7, declared that the most important subject in connection with coal mining to be considered by the next legislature is the electrical hazard. Other union officials condemn the use of electricity in the mines as "needless and dangerous." A new law should be drafted to make impossible the danger from the general use of electricity, some of the miners urged.

The litigation over the \$400,000,000 assessment of coal lands in Schuylkill County, which was regarded as practically settled, was reopened during the week in court by a large number of attorneys representing the county, who told the presiding judge that they were unable to agree with the coal companies and owners on the settlement proposed. Hearings on the whole litigation were therefore asked on behalf of the county. Later an application was made to the court for a mandamus on County Treasurer Hensyl to compel him to proceed with the sale of lands on which the taxes have not been paid for the last two years. Attorneys for the coal companies view the procedure with indifference. They believe the decision of the Supreme Court in the Kemble case of Philadelphia settles all other pending cases. This estate, instead of getting an increase of assessment from \$250 to \$800 an acre, had its assessment lowered to about \$90 an acre on a decision of the Schuylkill County Court, which closely follows the opinion of the Supreme Court.

In connection with the winter meeting of the Coal Mining Institute of America in Pittsburgh, Pa., Dec. 3-5, the members will have the choice of two interesting inspection trips. One is to see the 35-car revolving dumps, the five-mile belt conveyor system in the Colonial mines of the H. C. Frick Coke Co., near Grindstone, Fayette County, Pa.; and the river tippel on the Monongahela River near Fayette City, fed by the above mentioned conveyor system. The other is to observe the rock-dusting system of the Inland Collieries Co. at Indianola, in Allegheny County, in the double Freeport field. This is a very gaseous mine.

Of the 180 fatal accidents in Pennsylvania industrial establishments during October, 69 occurred in the mines, according to the State Bureau of Workmen's Compensation. Forty-seven of the fatalities were reported to the bureau from the transportation companies and 64 from other industrial concerns. Forty of the mine fatalities were in the anthracite district and 29 in the bituminous region. Lackawanna County reported the largest number of fatal accidents in the mines, 15, and Luzerne was second with 14. The deaths by other counties in the hard-coal section were: Carbon, 2; Dauphin, 1; Northumberland, 4, and Schuylkill, 4. The bituminous district fatal report showed: Allegheny, 2; Cambria, 3; Clarion, 2; Fayette, 6; Greene, 1; Indiana, 3; Lawrence, 1; Somerset, 3; Washington, 5, and Westmoreland, 3.



Courtesy Bertha-Consumers Co.

#### Tippel at Rachel Mine

Rear view of top works at Bertha-Consumers operation at Downs, W. Va., in the Fairmont gas-coal field. The mine has its own locomotive for efficient yard shifting.



Directors of the Lehigh & Wilkes-Barre Coal Co., on Nov. 19 declared the regular quarterly dividends of \$3 on the common and 1½ per cent preferred stock and an extra dividend of \$3 on the common stock. Early this year directors declared a stock dividend of 200 per cent payable one share of preferred and one share of common for each share held by stockholders of record March 26. After April 1 last holders of the old capital stock were to exchange their holdings for an equal amount of new common stock. After such conversion and distribution of the stock dividend, shareholders will have received two shares of common and one share of preferred.

C. A. Saunders is now the *Coal Age* circulation representative in the anthracite field. He succeeds Sage Coe, who has been transferred to the Philadelphia district. Mr. Saunders is not new to the coal mining industry, as he has been covering the Nova Scotia field for the last two years.

## TENNESSEE

The Durham Coal & Iron Co., James Building, Chattanooga, has leased several thousand acres of coal land from the Waller interests and will develop the property.

The Glen Mary Coal Co., 227 James Building, Chattanooga, has acquired 1,200 acres of coal land near Glen Mary, and will equip the property for an output of 250 to 500 tons per day. The company probably will purchase a steam shovel mounted on caterpillars, as well as dump cars, rails, etc.

## UTAH

Coal production in Utah for October was 441,789 tons, compared with 535,698 tons in October of last year.

## VIRGINIA

H. M. Fadely, formerly manager at Norfolk for the local County Coal Corporation, is now sales manager for the Dudley Coal Co., with headquarters in Richmond. John W. Bunting, formerly with the C. & O. Coal & Coke Co., and one of the best known men in the trade, is now associated with Dichmann, Wright & Pugh, steamship agents at Norfolk.

## WEST VIRGINIA

The Pond Creek By-Product Colliery, which really is the fuel department of the Norfolk & Western, has eliminated heavy haulage costs by installing an aerial tramway near Williamson which eliminated two bridges, a good deal of track and trestling.

A record for monthly coal production was made in September, 1924, along the Chesapeake & Ohio Ry., the total output being 4,162,665 tons. During the early part of October the movement was equally large, the Logan field contributing 38.5 per cent of the coal loaded in the several fields served by this road. During the first week of October the Logan field shattered all

previous records by loading 1,318 cars daily, a daily output of 65,000 tons. During the second week the average was nearly maintained. Average daily loadings during the first fourteen working days of October amounted to 1,292 cars of fifty tons capacity. In 1902 the C. & O. moved 4,164,260 tons during the entire year.

General Edward O'Toole of the United States Coal & Coke Co., operating in McDowell County, has announced that Gary No. 7 mine will resume at once, giving employment to about 400 men. The mine has been closed down since last June. Other coal operators in McDowell County are optimistic about conditions and expect that in less than 30 days practically all of the mines in the county will be working full time.

The Supreme Court of Appeals of West Virginia, in a decision dealing with the liability of coal companies for injury or death of boys under 16 employed in the mines in violation of the state mining laws has held that "A parent who consents to employment of his child under the age of 16 years in a coal mine is not precluded from recovery as the sole beneficiary if the accident causing the death of the child in the mine is the result of negligence of the employer for which recovery would be had if the employment had been legal." The decision also held that the parent cannot recover if the unlawful employment is the proximate cause of the death of the child.

## WISCONSIN

The Consolidation Coal Co. is attempting to avoid what it considers double taxation on coal stored on the Milwaukee docks of the Great Lakes Coal & Dock Co. It has applied for a writ of certiorari to stay proceedings by the State Tax Commissioner. The company is to pay an occupational tax of \$7,313 under the Wisconsin law and therefore objects to paying \$375,000 of personal property tax on the same coal.

## CANADA

K. A. Blatchford, Mayor of Edmonton, Alta., says that coal from Alberta soon will be making a strong bid for the Pacific Coast bunker trade and that it may be expected to cut into the domestic business of the coast. He asserts that Alberta steam coals compare with the finest on the American continent and that lignites from Edmonton and Drumheller have "run American anthracite out of Alberta and Saskatchewan altogether and have cut the anthracite business of Manitoba to a fraction of what it was." He says that better freight rates, for which Alberta is fighting, is all that is necessary to put the coal of that province in the markets of both the extreme East and West of Canada.

The Dominion Advisory Fuel Committee has issued a further warning on the "continued apathy" of the anthracite-using public in the matter of winter supplies. Imports of hard coal from the United States between Jan. 1 and Sept. 30 were 833,421 tons less than

for the same period last year, and importations from Great Britain are 20,324 tons less. The chief anthracite-consuming provinces are Ontario and Quebec, and in these two provinces alone imports have declined more than 800,000 tons. It is pointed out that the principal mines producing Alberta domestic coal have been shut down since April 1 and are only now resuming production, and even if railway rates were such as to permit any considerable movement of Alberta coal to the East, the needs of the Prairie Provinces would first require to be supplied.

At the District Convention of District No. 26 of the United Mine Workers at Sydney, N. S., on Nov. 17 a motion was introduced to admit delegates from the One Big Union miners of Thorburn and Stellarton, the locals of which recently seceded from the U. M. W. President J. W. McLeod ruled the motion out of order on the ground that the O. B. U. was a dual organization seeking to oust the U. M. W. from control of the district. His ruling was sustained by a vote of 65 to 10.

The Coal Creek Mine, at Fernie, B. C., owned by the Crows Nest Pass Coal Co. which recently resumed operations, is closing down indefinitely. An official statement has been issued giving as a reason "failure to retrieve sufficient business" and advising miners to seek employment elsewhere.

## Association Activities

The West Kentucky Coal Bureau, a traffic organization supported by over 90 per cent of the mines of the western Kentucky field, had a good attendance at a meeting on Nov. 11, at which time two new members were added, and announcement made that a third would come in shortly.

Transportation and traffic matters absorbed the attention of the Smokeless Coal Operators Association of West Virginia at the November meeting in New York. The members were informed that the new all-rail rate of \$2.84 per gross ton from the Pocahontas field to Washington would be come effective on Dec. 8. A special committee was appointed to investigate the possibility of effecting uniform conditions in connection with the demurrage tariff situation at Hampton Roads on the Norfolk & Western, the Chesapeake & Ohio and the Virginian railroads. It has been tentatively agreed to hold the next meeting at Washington on the second Thursday in December. Among those in attendance at the November meeting were R. H. Gross and S. A. Scott, of the New River Coal Co., the former being the president of the association; T. F. Farrell of the Pocahontas Fuel Co.; E. E. White, of the E. E. White Coal Co.; W. D. Ord, of the Empire Coal & Coke Co., and T. S. Crockett, of the Leckie Coal Co.

## New Companies

The Lincoln Coal Co. has been incorporated in Covington, Ky., with a capital stock of \$15,000, by Irvin Davis, H. M. McLain and August Helm.

The Erbest Coal Mining Co., with a capital stock of \$200,000, has been formed at Marion, Ill., by C. I. Hayden, William H. Warder and R. E. Mitchell.

The Line Creek Coal & Land Co., capital stock \$10,000, has been formed at Nelsonville, Ohio, by C. C. Sharp, C. B. Sharp, Fern Parry and others.

The Hill Valley Coal Co. has just been organized, with a view to operating at Julian, in Boone County, W. Va. This company is capitalized at \$25,000 and was incorporated by M. A. Fore and associates.



## Traffic

### Proposed Rate Changes on C. & O. Cancelled by I. C. C.

The Interstate Commerce Commission declined on Nov. 20 to sanction proposed increases and reduction in rates on coal from points on the Gauley branch of the Chesapeake & Ohio, in West Virginia, to various destinations east and west thereof. The schedules have been under suspension since Aug. 25, but according to an order issued by the commission are now cancelled and the entire proceedings dismissed.

### Increase in Rates Suspended

Proposed new schedules increasing the freight rates on bituminous coal from Evansville, Ind., and related points to points on the Chicago & Eastern Illinois Ry. were ordered suspended Nov. 14 by the Interstate Commerce Commission from Nov. 20 until March 20, 1925. The commission will investigate the reasonableness of the proposed new rates.

### Lower Coal Rate for Port Huron

Coal rates affecting Port Huron, Mich., and the river district will be reduced 35c. a ton, effective Dec. 1.

Under the new rates the Pere Marquette will no longer carry coal from Ohio north to Saginaw and then south to Port Huron, as has been done in the past. The new routing will take the cars across the river at Detroit, bring them up through Canada to Sarnia and ferry them across to Port Huron. This means a direct saving in miles carried as well as in rate. The new rate applies to coal billed for Marysville, St. Clair, Marine City, Armada, Washington, Chesterfield, New Haven, Richmond and Smith Creek.

Roads carrying directly to Port Huron which will operate under the new rate are the Grand Trunk, Pere Marquette and Detroit-Toledo Shore Line.

It was estimated by officials of the Pere Marquette that \$175,000 would be saved local industries during the first year of the rate reduction.

### Not to Reopen Western Rate Case

The Interstate Commerce Commission declined on Nov. 10 to reopen for further argument the case involving new Western coal rates. Petitions for a re-argument of the case were filed by the Public Service Commission of Wyoming, the Rock Springs-Kemmerer operators and others. The I. C. C. held that the rates it had fixed on coal from Colorado producing fields to points in northeastern Colorado are just and not discriminatory.

## Industrial Notes

Alfred G. Norris has been appointed manager of the New England office of the Strom Ball Bearing Mfg. Co., with offices at 75 Pearl St., Hartford, Conn. He has been identified with the ball-bearing industry for a number of years and is well known among industrial engineers and manufacturers in the New England States.

A. W. Wiese, sales engineer, has been transferred from the Philadelphia office to the Hartford office.

The Tri-State Engineering & Construction Co. has just taken over the contracting business of C. I. Keck, of Morgantown, W. Va., after having been organized as a result of the consolidation of the T. R. Marshall Engineering Co.; Baritell Brothers, engineers, of Morgantown; McCutcheon Engineering Co.; R. A. McCall Construction Co.; and J. E. Falter, construction engineer. The new company, of which T. R. Marshall is president, is capitalized at \$50,000. It will project its work into all sections of the West Virginia, Ohio and Pennsylvania fields. Mr. Marshall's company has been specializing in mining and coke-plant construction.

Conveyors Corporation of America, Chicago, Ill., announces the appointment of Frederick E. Bausch, 1105 Chemical Building, St. Louis, Mo., as district representative of eastern Missouri and southern Illinois.

The stockholders of Joseph T. Ryerson & Son, Inc., Chicago, have purchased a substantial interest in the Reed-Smith Co., Milwaukee. The Reed-Smith Co. is an independent steel warehousing company serving the industry in that section of the country. Under the new plan the officers of the Reed-Smith Co. are D. M. Ryerson, president; George W. Smith, vice-president and general manager; E. L. Hartig, treasurer, and Carl Gallauer, secretary. Joseph T. Ryerson & Son is the largest independent steel warehousing organization in the country, operating plants at Chicago, St. Louis, Cincinnati, Detroit, Buffalo and New York. A complete range of steel products, including bars, shapes, plates, sheets, tubes, rivets, bolts, nuts, etc., is maintained at all six plants.

## Obituary

George W. McNeil, president of the Grand Junction Mining & Fuel Co., general manager of the McNeil Coal Co., and secretary of the Cameo Mercantile Co., died Nov. 4th at St. Joseph's hospital in Denver following an operation. He was buried the following Saturday. In his death Colorado loses one of its most progressive mining men.

James Wood, well known in the coal industry of central Pennsylvania, died at his home in Punxsutawney, Pa., on Nov. 17, aged 82. He had been connected with the Berwind-White company over 40 years. He had been a miner in England and came from there in 1868. He leaves a daughter and four sons.

George S. Blewitt, aged 50 years, purchasing agent for the Vinton Colliery Company for the past 31 years and one of the most prominent residents of Vintondale, Cambria County, Pa., died suddenly at his home on Tuesday morning, Nov. 18. He is survived by his widow and two sons. He was prominent in Masonic circles and was Justice of the Peace in Vintondale.

## Coming Meetings

**National Exposition of Power and Mechanical Engineering.** Annual exposition, Dec. 1-6, Grand Central Palace, New York City. C. F. Roth, Grand Central Palace, New York City.

**American Society of Mechanical Engineers.** Annual meeting, Dec. 1-4, Engineering Societies Building, 29 West 39th St., New York City. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

**West Virginia Coal Mining Institute.** Annual meeting, Dec. 2-3, Welch, W. Va. Secretary, R. E. Sherwood, Charleston, W. Va.

**Coal Mining Institute of America.** Annual meeting, Dec. 3-5, Chamber of Commerce Bldg., Pittsburgh, Pa. Secretary, H. D. Mason, Jr., Box 604, Ebensburg, Pa.

**West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers.** Fourth annual convention, Dec. 12 and 13, Huntington, W. Va. Secretary-Treasurer, Herbert Smith, Huntington, W. Va.

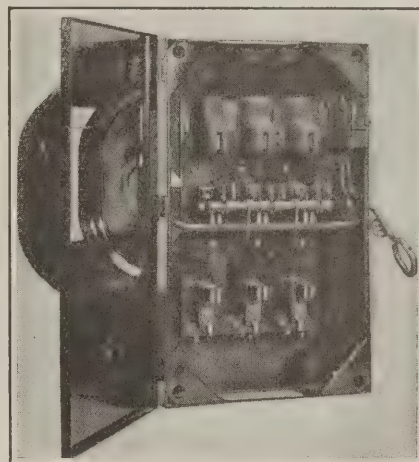
**American Institute of Mining and Metallurgical Engineers.** Annual meeting, Feb. 16-19, 1925, 29 West 39th St., New York City. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

**American Institute of Electrical Engineers.** Midwinter convention, Feb. 9-13, 1925, 29 West 39th St., New York City. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

## New Equipment

### Switch With Each Part Set On Separate Base

Most electrical men who have had maintenance experience around plants where the common type of knife switch is used are familiar with the necessity of having to remove the entire switch when perhaps just one of the blade or fuse contacts is burned and needs replacing. The Square D Co., of Detroit, Mich., has developed a line of indus-



### Switch Without Slate Base

The individual insulating bases are mounted on a metallic back. The copper connectors, carrying clips and lugs, are easily renewed. The switch pictured has protectors on the line contacts.

trial safety switches on which contact renewals can be made in a short time and at small cost.

Instead of the switch being mounted on the customary slate base, it is mounted on metal and each part insulated from the metal by a small piece of molded insulating material.

This individual base construction makes it possible to remove any part from the front of the switch in a few minutes without disturbing the wiring. It is unnecessary to remove the base from the switch box. The copper connector has fastened to it a jaw at one end and a solder lug at the other. Both are held by means of bolts with the heads in a downward position. The bolts are kept from turning by fitting the heads into grooves in the separate bases. The connector is fastened to the individual base by a screw which threads into a brass socket molded in the insulation. The removal of this single screw permits quick replacement of the switch jaw, connector or solder lug.

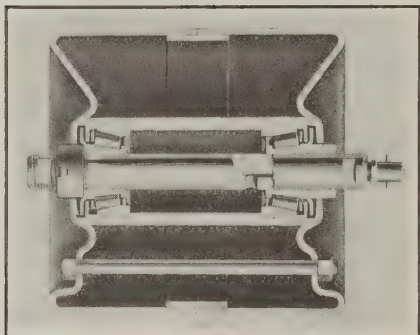
It is claimed that the molded insulating material of the individual bases is tough and will not break or crack, also that there are other advantages in not using slate. The switch weight is reduced about 25 per cent and the possibility of short-circuits in the metallic streaks, which sometimes occur in slate, is eliminated.



Another interesting feature is the provision of porcelain protective covers for the line contacts where the operating conditions warrant this precaution. When a switch is in the "off" position the only live parts are the line contacts. By having these protected it is only through intentional effort that a person, who may open the switch box, can make contact with live parts. The individual porcelain covers can be easily attached or removed without disturbing the rest of the switch.

### Idlers with Anti-Friction Bearings Save Power

The Stearns Conveyor Co., of Cleveland, has put into service their new special belt conveyor idler, equipped with Timken roller bearings. The device is being used with their complete installations of material handling equipment,

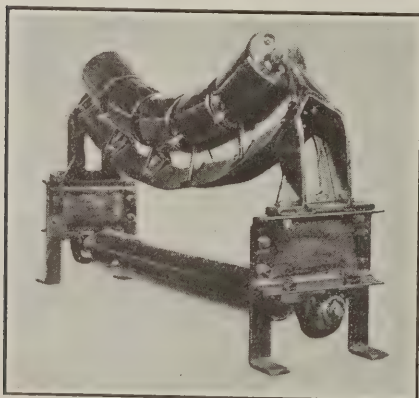


**Dirt and Dust Cannot Get Into Bearings**

Grease under high pressure is introduced to the bearings. Old grease is forced out and it acts as a seal against dirt or dust.

but they are also designed to make possible their use to replace any type of carrier now installed.

The pulley shells, made of No. 10 gage pressed steel, drawn together with rod bolts, are practically indestructible. The through pulley shafts are fitted with roller bearings, of the same size as used on the front axles of Ford automobiles. The generous size of this bearing allows a large factor of safety but when wear does begin, it easily can be compensated by means of the adjusting nut at one end of the shaft without



**If Idlers Run Freely Small Motor May Be Used**

The rollers run so freely that the conveyor requires but little power to drive it. Inclined conveyors are much cheaper than old types because of the reduced investment in the driving motor.

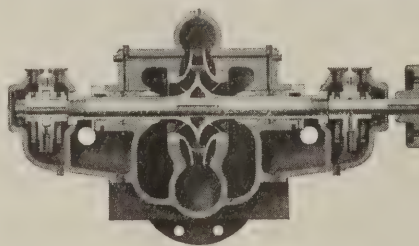
removing the pulley from the carrier.

The bearings are carried in heavy steel tubes inside the pulley shell. These tubes also serve as a reservoir for grease. One of the outstanding features of the carriers is the method of applying high-pressure lubrication. Grease applied to the high-pressure fitting on the end of the shaft enters the grease reservoir near the center of the pulley, forcing the worn-out grease from the bearing out through the labyrinth washers. The grease seal thus formed prevents any dust or grit from entering the bearing. These pulleys require greasing not more than once or twice a year, and to do so, it is not necessary to remove the pulley from the carrier.

### Small Centrifugal Pump as Efficient as Large Ones

A new low-head pump has recently been developed by the Allis-Chalmers Manufacturing Co. This new pumping unit is similar to the present type S design which has long been one of the standard types manufactured by the company. The new pump will be built in small sizes, and most of the details will be similar to those of larger units, except that a number of mechanical improvements will be incorporated. The efficiency of the pump has been raised by several important changes which reduce the hydraulic losses.

The cross-sectional view of the pump shows a few of the new features. The bronze companion wearing rings are L shaped to reduce disturbances in suction passages and thus increase the efficiency. Split bronze inclosed glands are provided with drains to prevent water from being thrown off revolving

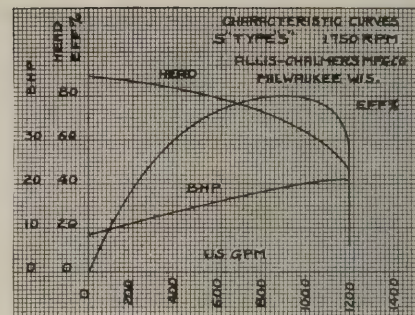


**Small But Efficient Pump**

This new unit has all the features that go to make up a high-efficiency, large-size centrifugal pump.

parts and entering the oil-lubricated bearings. The stuffing box throat is provided with bronze bushings which can easily be removed and replaced. The shaft is made of annealed steel and is provided with removable cast-bronze sleeves which extend from the runner hub to the inside of the bearing housing.

The outboard bearing is the double-acting type. It is firmly fixed and locked in position so that it cannot become loose. Thrust is taken in either direction, and a center collar is provided. The oil bearings are split and provided with two oil rings. Oil is led to the center of the bearing and it is thus completely lubricated over its entire length. All oil-hole covers are self-closing, thus keeping out dirt. Oil-level indicator cups are supplied with each bearing. The water seal passages are



**Operating Characteristics Prove Important Facts**

The curves of this 5-in. centrifugal pump show that it can deliver 900 gal. per minute against a 68 ft. head at an efficiency of 80 per cent.

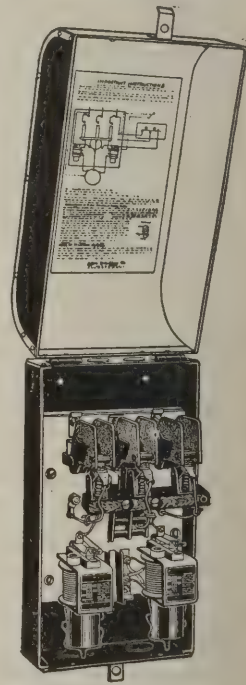
integral with the upper half of the casing and can be arranged for outside seal whenever necessary.

The shaft nuts are unusual in that they are designed to act as oil throwers to prevent oil from creeping along the shaft, and also to prevent any water from entering the bearings. The characteristic curves of the pump show its performance under various conditions.

### An Across-the-Line Starter

A push button starter for squirrel-cage motors up to 25 hp., 220 volts or 35 hp., 440 to 550 volts and self-starting polyphase motors up to 50 hp., has recently been developed by the Allen-Bradley Co., Milwaukee. It is equipped with inverse time limit overload relays, no-voltage release, push button station and copper-to-copper rolling contacts. It is also inclosed in a steel cabinet and operated entirely from a push button station with a start and stop button.

Relatively small induction motors on large power lines do not create serious line surges because the initial inrush current is only a small percentage of the capacity of the line. It is not generally recognized that the induction motor has inherent characteristics which prevent it from drawing more than a limited amount of current under the most severe starting conditions. The transformer action between the two windings of the motor exerts a demagnetizing action when the current has reached a certain value.



**Protective Starter**

Small motors do not ordinarily cause serious line surges yet some kind of switching device is always necessary to protect the equipment.



# COAL AGE

McGraw-Hill Company, Inc.  
JAMES H. MCGRAW, *President*  
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Devoted to the Operating, Technical and Business  
Problems of the Coal-Mining Industry

R. DAWSON HALL  
*Engineering Editor*

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Number 23

## How About Another Club?

**C**HRISTMAS and vacation clubs have enabled people of impecunious habits to finance their Christmas giving and their yearly trips to the country. The two kinds of provision for the future balance one another admirably. The banks have Christmas money coming in midsummer when they are meeting the drain of the vacation payments, and vice-versa.

How about coal clubs with payments ranging through the year and maturing when coal can be purchased most cheaply and with the greatest assurance of delivery? It certainly should please the coal operator and afford the consumer cheap and cleaner coal, assured delivery and the least strain on his pocketbook.

After all why not? The cost of coal is greater than that of the Christmas giving and but little less than the high cost of vacationing. More power to the scheme if it can be achieved! Insurance in all forms is popular. Why not insure a full coal bin and avoid winter worry? Even the apartment-house owner and factory manager might favor it. And the banks would be benefitted, for it would smooth out their load curve by making three periods of maturity instead of one or two. It would leave more money in their hands at each period of maturity.

## Ready to Your Hand

**P**LANT publications are expensive, especially if of frequent issuance, and on looking them over one sometimes wonders whether the miners' circulars of the Bureau of Mines would not be a fair substitute for them or at least a valuable supplement to them. One of the leading themes of the plant paper should be safety, and this feature the Bureau of Mines' miners' circulars teach to perfection, better perhaps than an article from the general manager or his superintendents.

In many cases these publications cannot be obtained without charge, the free list being already exhausted, but they can be purchased at a low price from the Superintendent of Documents at Washington.

If, however, the plant publication is provided why not in preparing it draw freely from Bureau of Mines' publications, leaving out parts which might not relate to workings such as yours and giving due credit for the material taken. The Bureau is anxious to have an opportunity like this to do the industry a service.

The work of the Bureau is hampered by inadequate distribution of its pamphlets. It is waiting to aid in safety work if an opportunity only be given. Mining men would seem to have overlooked what an advantage the publication of these elementary monographs confers on them. Mine superintendents and managers should have most of the Bureau's publications—certainly all those relating to safety—and should make it a point to see that all responsible men in the organization

not only receive or purchase them but read them as soon as they are available. They should be seen in every mining man's library.

## Get Together Electrically

**W**ITH consolidations of companies the whole question of the efficiency of the private power plant is revived. A group of adjacent mines can build and operate a power plant much more economically than a number of individual mines could maintain one at each opening. The new plant built for them all can be of the most modern type. It is true it will not be able to avail itself of an advantage which each of the others might have taken but usually did not, for it cannot use the refuse coal of all the mines, though it can use the refuse from one or two and so economize where the others failed.

So many economies go with an adequate plant that each new consolidation should be followed by a careful inquiry as to the advantage of manufacturing power at one or more of the mines thus consolidated. The diversity factor of many mines probably will be better than that of any one of the mines in the group. A get-together financially should be followed by a get-together electrically.

An article in this issue shows how a company buying power combined its loads in metering them and saved 19 per cent in its power bill. This shows how having a plant for several mines will smooth out the load curve and make the operation of the power plant for a group of mines more economical.

## How Many Sub-Bosses Have You?

**A**DEQUATE supervision is the secret of success. Neither tonnage nor economy can be obtained without it. Even if every man on the job were keyed up to do his best he could not do it if there were no correlation of effort. Nowhere is a man more helpless than in the mines unless he is given a proper degree of co-operation from the forces outside. But, as men rarely exert their best efforts, still more do they need to be under supervision.

The tracklayers, bratticemen and roadmen can usually make a pretense of energy without achieving anything. There are lots of plausible excuses for idleness—waiting for boards or props, for some one to square a room neck, for water to be removed, for the smoke to drift away, for rock to be loaded, for trips to be pulled, for spikes or rail to arrive. When such men delay their work they hold back other men. Often they have made up their minds to follow a set plan, and a little interference at one place holds up their efforts, when if they would work where opportunity presented they could fill in almost every idle moment. Some men



have an irritability that prevents them from regulating their work to circumstance. So they need to have the guidance of a boss.

Give the mine foreman plenty of help. Put the men holding subordinate positions definitely under the mine foreman, hold him responsible for their work, and he will get results. Men who on the surface would not be permitted to work without supervision are often put to work underground in the dark without a boss. The reason is simple. We all know how men idle when working above ground, but we do not know how often men dilly dally below ground, or how often they go to sleep on an overcast or in a return entry when they ought to be working. We all know how men find excuses for idleness in the open air. There are more excuses in the mine, yet we allow the men who find them to idle on the job without observation. Supervision is not money thrown away, it is money well invested. Many a mine fails to get out cheap coal because all the supervision is left to one mine foreman.

### Fear and Fatality

**S**AFETY MEN, showing us how accidents can happen, are beginning to hedge a little and to question whether the psychology of fear may not produce the very dangers against which they have been warning. It cannot be gainsaid that fear sometimes is a cause of accident. The animal or the man attacked by a savage beast is likely to be palsied by fear and unable to run or even feign death. The man who will walk along a plank laid on the ground without a tremor will quite generally fail entirely to walk that plank if laid between two windows on the fourth story of a building.

An automobilist whose engine stops on a railroad track may fail utterly to use the same judgment that he would summon to his aid if his engine stalled at the side of the curb. Locked in a hotel room by a key which he himself has turned on his own side of the door, a man may fumble and burn to death before he can turn the key if the house catches on fire. Fear masters him. His judgment no longer controls his body.

The same may be true of a miner. His dread of a roof fall may make him unable to run; his fear of death from the afterdamp of an explosion may enfeeble his body and destroy his judgment. In fact the apprehension of death often causes a man to interpose but a feeble resistance to disease when it attacks him.

Perhaps there are dangers against which we may battle best if our minds have not been prepared beforehand to anticipate and dread them. It may be that in regard to some accidents the less we dwell on them the better we shall meet them when they confront us. We need regarding these to think less about the result and more about prevention, lest when they confront us we may be enfeebled to combat them rather than instructed how to avoid them. Our instinct then may serve us better than education.

But fear, if not too abject, often is our best counselor to safe action. Many of us, in strange circumstances, would be disposed to take risks if not duly counselled by discomfiting anticipations, and in a campaign against accident we would do well to remember that there is a safe and unsafe measure of fear. There are premonitions which spur us to caution. There are fears which unnerve. The passenger on a boat in a stormy sea often is made helpless whereas the seaman on that same boat is moved only to take further precautions. He even accepts certain risks that

he may avoid greater dangers to himself and his associates.

In the safety campaign gruesome posters frequently are undesirable because they stress danger rather than precaution. They may cause more harm than they cure. They may help some men, and they may harm others. Our reactions are quite dissimilar, and the poster that will serve with some a useful purpose may not be uniformly helpful. It is sometimes a matter of balance whether a poster or other warning will, in the main, be helpful or harmful. Timorous persons may be merely scared by them. Bolder men may be counselled to take measures of prevention. Still more fearless men may take them as a "dare" and as an opportunity to obtain a thrill that appeals to their adventurous souls.

However, men exposed to dangers cannot well avoid realizing the results of accident, and consequently perhaps our gruesome posters will not scare them at all. But if posters do not make men think, they serve no purpose whatever. Consequently it would seem better to use posters that deal with preventive methods rather than with terrifying outcomes, though there are eventualities of a more remote character that we can portray such as poverty in the home, widowhood and orphanhood that do not introduce the fear complex.

### Right to be Heard

**A**FTER years of neglect, electrical engineers are being asked to give their views as to power savings. Time was when the big boss refused to listen to them, and they learned to be silent and discreet. When they pleaded their case it was met with a shrug of the shoulders and other visible signs of impatience, but the external pressure of power bills has brought even the big boss to a realization that the right kind of electrical engineer can be of considerable assistance in lowering his costs.

Many are the ways in which electrical engineers can save money for their companies, and successful is that electrical expert who is ready with suggestions when they are sought. The superintendent who does not listen is slated for replacement. If he adapts himself to the suggestions of the electrical engineer he will better his standing with the company for there is much that the electrical engineer can tell him as to economy. He can lower his line losses by the use of substations near the load, by providing adequate conductors and by better bonding. The same provisions will assure him of more adequate power for operation, decreased depreciation of equipment and fewer burnouts.

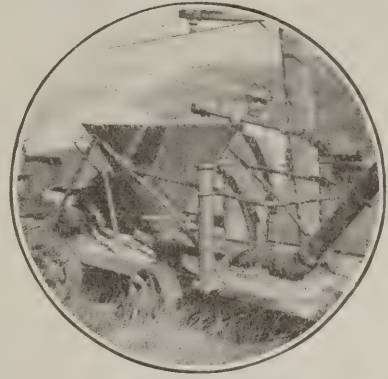
By the introduction of automatic substations he can reduce labor costs. By distributing loads he can cut down his power cost and he can avoid the purchase of much unnecessary machinery for his generating station, should he have one. By correcting his power factor if he uses alternating current he can increase the carrying capacity of his conductors without a heavy bill for copper. By the same means also he can make better use of the power he is generating or purchasing. By better bits he can lessen his cutting costs and avoid burnouts and deterioration.

Consequently it will pay him to have his electrical engineer at the Huntington meeting of the West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers where he can get in touch with new developments, most of which relate to power saving.



## Rock Dust No Cure-All, Say Western Engineers

Coal Fields That Introduced Dusting in America in 1911  
Today Consider Water Also Essential—High-  
Pressure Dusting Wins Favor—Mud-  
Spraying Experiments Progressing



BY E. W. DAVIDSON AND ALPHONSE F. BROSKY  
Editorial Staff, *Coal Age*

**R**OCK DUSTING is no cure-all for the explosive ills of coal mining. It is necessary in most mines, but no mine can be rendered safe against the explosibility of coal dust by the use of pulverized rock alone. Water, judiciously and persistently applied is just as necessary.

This is the conclusion of the West—the coal mining region in which rock dusting was introduced to America. The West ambitiously is dusting today, in an effort to live up to the expectations that every mine in the mountains be dusted before winter. Fifty miles of entry are already dusted. The West is distributing dust by traveling blowers in large volume at low pressure and in small volume at high pressure. It is discharging dust into intake airways. It is spreading dry adobe by hand and by machine and is getting several distributions from each application by stirring up the floor layer occasionally. It is using ground limestone, leucite,\* gypsum and shale. It is spraying dust in the form of mud. It is trying literally every method of "dusting" known—and some that are unknown. And in addition to that it is using water liberally in regions where water is available.

There have been many object lessons in the Rockies during the past three years of the horrible loss and suffering caused in mines that are not dusted. Furthermore, in September there was an object lesson offered by the Rains mine of the Carbon Fuel Co. in which an explosion killed five men but was markedly reduced in force and finally checked entirely by rock-dusted areas.

In view of all this experience, the West may know what it is talking about when it says rock dust is no cure-all, but that dust and water together come near attaining that distinction. Its judgment is based on practice.

There really is little that is novel in 1924 about the dust blower and the dust trough barrier now used in a handful of mines in southern Illinois, in one mine of western Kentucky and in a scattered few in West Virginia and Pennsylvania. Both were used in Colorado

in 1911, and Wyoming saw some dusting in that same year.

The earliest protective dusting in this country was at the Delagua mine of the Victor American Fuel Co., in southern Colorado. That company was inspired by rock-dusting experiments in England. Capt. Jack Smith, safety engineer for the Union Pacific Coal Co. at Rock Springs, Wyo., recounts that "an English operator at Altofts, Eng., as early as 1906 noticed that natural shale or inert dust checked the propagation of an explosion in his colliery."

The dusting at Delagua began in 1911 soon after a series of coal dust explosions including one at that mine. Such men as W. J. Murray, then general manager of the company and B. W. Snodgrass, then boss of Delagua, but now general superintendent, decided that adobe dust from the countryside was sufficiently inert to be used in the place of rock dust and certainly was fine enough when thoroughly dried by the sun. So they sent men out on the wagon roads in dry periods to haul large volumes of the road dust into protected storage.†

The first application of dust in the mine was made by men who carried dust in large buckets and threw it on the roof, ribs and timbers with small domestic coal shovels. The dust was thrown against the ribs, etc., with enough force to dislodge the accumulated coal dust and replace it with adobe dust. In that manner the timbers, small ledges, crevices, and other lodging places for dust were loaded up to the angle of repose with inert dust, leaving less room for the lodgment of coal dust.

Then along the same roads, shelves were placed one above the other on the ribs by drilling holes in the coal in which pegs were driven which supported the shelving. These shelves were loaded with as much adobe dust as would stay on them. At all points where height would permit, shelves were suspended to timbers with wire and loaded up with adobe dust; and at points where the roof was unusually high, V-shaped troughs filled with adobe dust were set at right angles to the entry on timbers and supported so that they could easily be overturned.

While this application was being made, a blower was constructed to blow adobe dust into suspension. Sev-

\*Way back in 1911 the machine illustrated in the headpiece was built and put into operation at the Delagua mine of the Victor-American Fuel Co. in southern Colorado. The idea came to B. W. Snodgrass, now general superintendent for the company, from England, where dusting was evolved experimentally in 1906. This machine blew adobe dust through the Delagua mine for three or four years. The dust was not ground, but merely shoveled up from the roads in dry weather and stored under cover.

\*Leucite is a rock-forming mineral composed of potassium and aluminum metasilicate.

†See "Prevention of Coal Dust Explosions, Vol. 2, p. 756, Nov. 3, 1912, and "The Explosion at Ravenswood," Vol. 5, p. 411, Mar. 7, 1914, in *Coal Age*. Both articles are by Samuel Dean.



eral types of blowers were constructed before one of practical value was perfected. The practice was to load up the hopper of this blower; then load two pit cars with adobe dust in sacks and send this train into the mine propelled by an electric locomotive. Two men went with it—one to operate the locomotive and the other to operate the blower. This blower was put in operation and hauled by the locomotive against the air current until all the dust had been blown away. The dust was blown against the ribs and roof where some of it naturally lodged immediately; some was carried long distances by the air current and, of course, much of it found lodgment on the floor.

A film of coal dust would accumulate on top of the adobe dust, especially on the shelves and timbers, and men were sent along the roads periodically to scrape off that film of coal dust and to pile on more adobe dust.

They found that by short circuiting the air on certain cross entries where the locomotive could not go, the air current would carry the adobe dust long distances and deposit a film of it on the roof, ribs and floor of rooms as well as the entries.

The Delagua mine was dusted with adobe systematic-

ally in Wyoming, now the property of the Union Pacific Coal Co. Superintendent Redshaw, in charge at the time, had the dust spread thickly on all entries so that it would mix with coal dust under the disturbance of travel. This was done because the extreme dryness of the region made sprinkling practically out of the question. Water for domestic purposes had to be hauled to Winton in tank cars. Although that was more than six years ago much of the original adobe dust is still noticeable along the ribs of the entries.

A chronology of early dusting in this country would record the next use of "rock dust" in the Allison No. 1 mine on the Monongahela River in Pennsylvania. According to H. I. Smith, chief mining supervisor for the U. S. Bureau of Mines, a few miners in 1914, on their own initiative began an interesting practice.

In front of each face to be shot they placed two carpenters' horses or other supports approximately 30 in. high. On these they rested a wide plank or platform heaped high with fine motor sand. The force of the shot blew this loose sand back toward the room neck and disseminated it freely but did not mix it with the coal to be loaded out. A charge of motor sand thus



#### Reliance Mine

One of the first to use adobe dust in America. It was dusted in 1911 and, even today though twelve years have elapsed, there is evidence in the manway of the mine of that early rock dusting.

cally and effectively until 1918 when the large supply of dust which had been stored in the previous year had been exhausted. After that the company relied upon sprinkling with water for protection against the coal-dust hazard. Now, however, systematic dusting has been readopted at the Delagua mine, and a dust-grinding plant is being installed. A new blower is in process of development.

In 1911, soon after dusting began at Delagua, the Reliance mine at Rock Springs, Wyo., then in process of construction, was dusted with adobe. George B. Pryde, vice-president and general manager of the Union Pacific Coal Co., says of this pioneering:

"When the slope, air course and manway had reached a distance of about 1,000 ft., adobe dust was scattered in the manway for a distance of about 600 ft. to a depth of about 8 in., it being the idea that as men and animals walked into the mine they would pick up this dry adobe dust and it would be carried in along the entry and deposited on the ribs.

"After a period of twelve years some of this adobe still remains in the manway. The ribs of the manway are heavily coated with this dust, and adobe is still noticeable along the ribs of some of the entries. This first attempt at rock dusting by The Union Pacific Coal Co. was inexpensive and fulfilled expectations."

Though dusting was discontinued at Reliance at about the entrance of the United States into the World War in 1917, another job of rock dusting was done in that same year when the Megeath Coal Co. made one general distribution of adobe dust through the Winton

was distributed with each 6-ft. advance in the territory worked by these men. The practice was continued for a year or so.

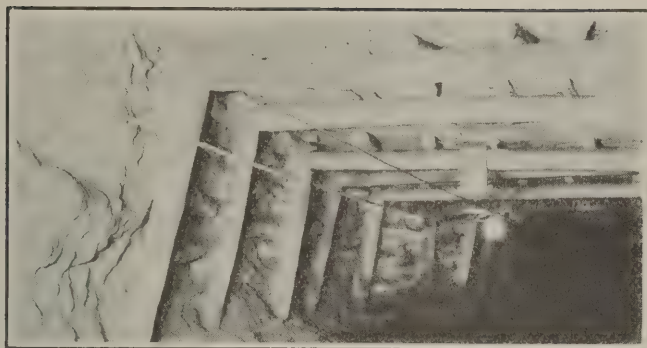
The next year—1915—the Pittsburgh Coal Co. experimentally dusted 2,000 ft. of entry in one of its mines with pulverized limestone but this proved to be merely a sporadic effort.

Soon after this exhaustive experiments in the use of finely divided shale began at the mines of the Old Ben Coal Corporation in southern Illinois. There, the greater part of the intensive development of dusting that has been carried on by coal companies was made. But not a single mine in southern Illinois followed the lead of J. E. Jones, Old Ben safety engineer, until a little over a year ago when the Burlington railroad, at its Valier mine nearby began intensive dusting along the lines laid down by Jones and the U. S. Bureau of Mines. Recently, the Chicago, Wilmington & Franklin Coal Co. has borrowed the Old Ben distributor and has dusted parts of its Orient mines, and one or two other large Illinois companies declare they will dust as soon as they find an efficient distributing unit. But the number is few.

The West Kentucky Coal Co., with twenty-two mines in its end of the state, has just installed an impact pulverizer and is crushing shale taken from above the No. 12 seam of coal. The company is dusting entries but not rooms in one of its mines, using V-trough barriers in all aircourses just outside the live workings.

A distributor has been built, under the eye of T. E. Jenkins, operating vice-president. It is a steel hopper





#### Cement Mortar Smooths Away Dust Lodgments

This main entry in Mine No. 6 of the Phelps Dodge Corporation has the ribs, roof and timbers treated with mortar by the cement gun. Although coal dust can accumulate it is given greatly reduced opportunity for lodgment when the angles are rounded by a cement mortar coat.

car with a screw feed driven through a speed reducer by a belt from the shaft which operates a blower. A 5-hp. motor supplies power. The stream of rock dust is directed by a man seated on the rear end of the car who handles a canvas discharge hose.

In the east the Indianola mine of the Inland Collieries Co., a short distance from Pittsburgh, under its general manager, T. G. Fear, was probably the first mine to adopt the practice of rock dusting on a large scale. It has completely dusted all the entries in the mine, which is a large one producing 3,000 to 3,500 tons per day. All the dust laid in this mine has been purchased, but a pulverizing plant having a capacity of about one ton per hour is in process of construction.

Several years ago, long before any notice was given generally to the merits of rock dusting, William Hulings, superintendent of the Gallatin mine of the Pittsburgh Coal Co., experimented with a rock-dust distributor. Evidence of the work of this machine was seen on the ribs along a stretch of entry in the Gallatin mine until it was covered by a more recent application of rock dust.

The Pittsburgh Coal Co. is working energetically in the rock dusting of its mines, all of which eventually are to be treated. About 10 carloads of rock dust have been shipped to this company, more than half of it already has been applied. Six of its mines have this work in various stages of completion, and rock dusting was started recently in the seventh, the Mansfield mine. Prepared limestone dust is being used. The company has been working on several types of distributing cars. One type which will likely be adopted as standard is equipped with a stationary nozzle. Mining men inside and outside the company are highly impressed with the machine. The company has gone a step farther than any other, to our knowledge, by building a special locomotive for rock dusting purposes, possessing the proper speed characteristics and other details best-suited to the needs of this work.

All the haulage roads (13 miles) in the comparatively newly developed Harmarville mine of the Consumers Mining Co., near Pittsburgh, have been covered with prepared limestone dust, applied by a distributor which this company has been developing. The dusting of aircourses is next on the company's program in this mine, and this work has been started.

In the Coverdale mine of the Pittsburgh Terminal Coal Co. rock dusting has become one of the standard mining practices. About six miles of haulage roads have been dusted by machine thus far; twelve miles of

haulage road and all the aircourses remain to be dusted. Prepared limestone dust, some coming from Ohio and some from Michigan, with 80 per cent fine enough to pass a 200-mesh screen is being used. In this mine a study of methods is being made by Research Fellow C. H. Dodge of the U. S. Bureau of Mines and the Carnegie Institute of Technology. This fellowship was instituted and financed early this year by the generous aid of interested parties.

The Hillman Coal & Coke Co. is laying prepared limestone dust by machine in two of its mines and will follow out a similar program in them all. One of the two mines of the Republic Collieries Co. at Russelton, Pa., is being dusted; the other is closed down. The Ontario Gas Coal Co. and the Lincoln Gas Coal Co. have just started in this work. The Springdale mine of the West Penn Power Co. is being rock dusted, and plans are being laid for this same treatment of the coal dust in its Beech Bottom mine in West Virginia.

In Washington County the Langeloth Coal Co. is preparing to rock dust. The Vesta Coal Co., the National Mining Co. and the Bethlehem Mines Corporation are investigating methods of rock dusting and the equipment required. Westmoreland County is represented by the Westmoreland Coal Co., which has been laying prepared limestone dust by a machine of its own make and by hand.

In Fayette County, where the need for rock dusting is about as great as in any locality in the country, little activity is noticeable. The Oliver & Snyder Steel Co. is one of the few companies in this county that are distributing rock dust. In Greene County the Nema-colin mine of the Buckeye Coal Co. and the Mather mine of Pickands-Mather & Co. have done much dusting by hand. They will use machines in the near future.

Only three companies, we believe, are rock dusting in Cambria County. One of these is the Berwind-White Coal Mining Co. which has developed a machine and is now engaged in rock dusting two of its mines; another is Peale, Peacock & Kerr, Inc., which also is installing a pulverizing plant, and the third is the Penelec Coal Corporation which has started to rock dust its five mines. The Pennsylvania Coal Corporation has been rock-dusting some of its mines by hand, but the work is still in an experimental stage. The company is disposed to favor the use of rock dust barriers.

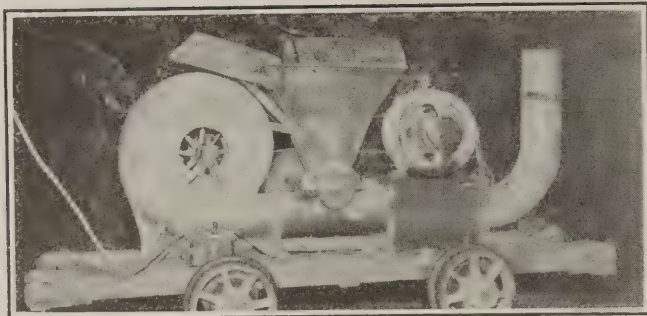
As for the other eastern states, little can be said except that they are surprisingly slow in taking advantage of the merits of rock dusting. Ohio operators apparently have given this matter no consideration.



#### Mill Tailings Applied by Cement Gun

Ribs and roof are partly coated with mill tailings applied with the cement gun and partly uncoated. The difference between the two can be clearly seen.





**Rock Dusting Machine at Old Ben**

This machine at the Old Ben Coal Corporation's plant, West Frankfort, Ill., has done such good work in Old Ben that it recently has been sent to the Chicago, Wilmington & Franklin Co. to do an equally beneficent work in its mines.

West Virginia is slow, particularly the non-union fields. The Consolidation Coal Co. is said to be developing rock-dusting equipment. It and one or two others save the state of West Virginia from being listed with Ohio. Robert Lambie, chief of the department of mines of West Virginia will probably present for enactment new laws before the next state legislature compelling rock dusting of all mines in this state.

Kentucky also is backward. The West Kentucky Coal Co., however, is installing a pulverizer and is rock dusting. Few other mines are following its footsteps. Neither Virginia nor Maryland have displayed active interest in the undertaking. Tennessee is doing little rock dusting. In Alabama many of the companies so far appear content to spend as much as 10c. per ton for wetting down coal dust (if this is possible) rather than save by rock dusting about 9c. of that cost. However, not all the Alabama mine owners have overlooked rock dusting. The Sloss-Sheffield Steel & Iron Co. is going into the work in a big way. It is installing a pulverizing plant. The Gulf States Steel Co. and the De Bardeleben Coal Corporation are beginning to rock dust and the Tennessee Coal, Iron & R.R. Co. has made designs for a rock-dusting car.

Limestone is being used almost universally in the East. The mine owners do not consider the use of any dark-colored rock dust good practice. They have discovered that powdered limestone dust is almost white and therefore reflects light much more efficiently and affords better illumination than gray shale dust.

Frank Haas, consulting engineer of the Consolidation Coal Co., suggests an investigation of the merits of the hydrous silicate of magnesium, steatite, more commonly known as soapstone or talc. In some deposits this rock is only one-third to one-half as hard as limestone and possesses approximately the same specific gravity. It is also extremely white. Extensive deposits are found in New York and in many coal-producing states. At present it is used chiefly in the manufacture of paper and composition roofing.

Many rock-dust distributors are being developed in the eastern mines but few have reached such a stage of operation as would warrant their being termed entirely successful.

As far as Canada is concerned we hear that rock dusting has been commenced by the Dominion Coal Co., and so far is confined to the main electric trolley road in No. 1B mine. The roof of the roadway is supported on steel girders and lined with concrete to prevent spalling. The road which is ballasted with slag is two miles long. The dusting has been done with powdered dolomite rock, 80 per cent of which will pass

through a 200-mesh screen. The first application was made by hand on the roof, sides and floor, the flanges of the girders all being filled. Five pounds per square yard were placed on the floor and 3 lb. on the roof girders. The incombustible material in the floor dust is not allowed to fall below 75 per cent. A second application has been made with the cement gun on sides and roof and on the floor except at crossings which are hand-dusted. Shelves containing one ton of dust are placed at 600-ft. intervals, and the mine is divided into panels, the entrances and exits of which are dusted for 400 ft. in the same manner as the main roadway. Compressed-air power is used in the workings exclusively.

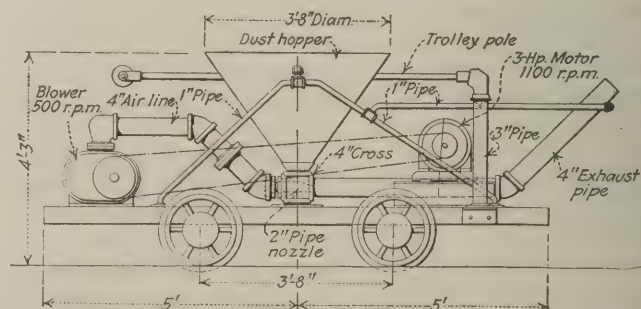
These Midwest and Eastern dusting enterprises, no matter how efficiently performed, do not convince the Western mining engineer of their efficacy where the mines are dry. It is the excessive dryness of the high altitudes which moves him to say that dusting alone is not sufficient protection against coal-dust dangers. Western engineers believe, with Dan Harrington, once a Bureau of Mines' engineer but now a consulting engineer in Salt Lake City, that precautions must be taken at the face to prevent the formation of coal dust and its dissemination by air currents.

"If we don't have that," declares Harrington, "the rock-dusted mines of this country are liable to suffer some severe jolts in the future, just as our sprinkled mines have been jolted in the past, due to slipshod methods and overconfidence in the efficacy of water."

The West has had some coal dust lessons that are still fresh in mind. It knows that dust on an intake airway which started a fearful explosion less than two years ago was 65 per cent inert—a percentage that rock-dust authorities generally consider will make the coal dust innocuous. This dust bred the explosion partly because it was extremely dry—2 per cent moisture by analysis—and because of its fineness. A large percentage of a sample taken at the point of the blast's inception passed through a 325-mesh screen. Dust such as this, which was mostly air settleings on timber caps and the like, was borne there by the air stream because it was not rendered harmless at the faces.

In western mines to make the dust moist is an important part of the program. The best examples of this effort are at the Stag Canyon mines of the Phelps Dodge Corporation, Dawson, N. M., but in several other Utah mines consistent sprinkling is required.

The usual practice is to lay 3-in. water lines in all main entries. In panel entries 1½-in. pipe lines carry water to points within 100 ft. of the faces. In rooms



**Earliest Dust Blower Design Not Unlike Models of Today**

This device, which was built in 1911 at the Delagua mine in Colorado consisted of a steel hopper to carry the dry adobe dust and a 3-hp. blower to force a stream of air through a pipe receiving the dust by gravity from the bin. A locomotive, two cars of dust in bags and this blower car comprised the trip which introduced the practice of dusting into the coal mines of this country.



$\frac{3}{4}$ -in. lines are maintained 20 or 30 ft. from the faces. On all entries hose connections are provided every 100 ft. for periodic sprinkling by hand and at room faces where the greatest emphasis is placed upon sprinkling, every loaded car is to be sprinkled by hose and each mining-machine cutterbar is equipped with a  $\frac{3}{4}$ -in. pipe, reduced at the end and bent down pointing directly on the chain, to saturate every ounce of bug dust that is made. These provisions with sprays for all loaded trips at main partings and various systems of atomizers and exhaust steam nozzles on intake entries are now being put in operation by western companies who regard them as important adjuncts to the distribution of inert matter through the mines.

In the practice of dusting, adobe has been lavishly used in most Rocky Mountain mines, especially those of the southern districts where that sort of dirt is obtainable almost anywhere around the mouth of the mine by the simple process of shoveling it into mine cars. It is spread through entries by hand shovel. Later it is stirred up by occasionally dragging the top of a pine tree through the roadways behind a trip. The extreme fineness and lightness of adobe dust when it is dry causes it to be easily stirred up and transported long distances in the air. One man for every 6,000 ft. of entry can keep this adobe raked loose and the coarse coal cleaned out of it. When the proportion of coal to adobe becomes dangerously high, the roadways are cleaned to a depth of 4 or 5 in. and a new application is made.

In dusting main return aircourses all loose coal and rock is loaded out, the ribs and roof being washed down several times. Every 500 or 600 ft. the stoppings between the main and return entries are broken through, and small doors are installed. Blowers are used to force the fine dust into the return aircourses through these openings. Thus suspended the dust travels a long distance before it is deposited on the floor, ribs, and roof. The material used is chiefly adobe, sun-dried and screened on the outside of the mine. A two-ton car load of this dust will cover several hundred feet of airway as little loss occurs, the deposit being from 2 to 6 lb. per running foot of entry.

Blowers are used to force the dust into the main returns. One unit consists of a small blower mounted on a truck with a 2-hp. motor. A 6-in. pipe is attached to the blower and runs the full length of the truck with a projection over the end. A hopper is built over the pipe and connected. Stove pipe or canvas tubing is led from the pipe through the door in the stopping so that the dust is discharged into the return air current.

But adobe is not commonly used in the Colorado, Utah and Wyoming mines which are now industriously dusting. There, the tendency this fall is to swing from surface dust to finely pulverized limestone. A number of pulverizing plants are now installed and more are in prospect.

The consensus is that dust coarser than 200-mesh is practically worthless and that a large proportion of it should be of 300-mesh. The 1924 report of the Rocky Mountain Coal Mining Institute's safety committee specified that rock dust "should be 100-mesh or finer." Since it was written, the western mining fraternity has come to put more and more emphasis on the "finer."

Though trough barriers have been installed in several Rocky Mountain mines, usually in batteries of six or more at all panel entries and at the bottoms of

slopes where the supposition is that they will be dumped by runaway trips, the main dependence is placed upon preventing explosions rather than upon stopping them. For more than a year intensive effort has been made to develop portable dust blowers of one type or another, each equipped with a fan distributing dust that is fed into the air stream from some sort of a hopper.

The tendency this fall, however, is to desert low-pressure dusting for that done by higher pressures. Such companies as the United States Fuel Co. and the Utah Fuel Co., both in Utah, and the Phelps Dodge Corporation in New Mexico, are introducing air-compressor units to provide air for blowers. With high-pressure air, a smaller quantity of dust will serve—usually less than 3 lb. per lineal foot of entry—and the fine coal dust on roof and ribs is more effectually dislodged. William Littlejohn, general superintendent of the Utah Fuel Co., feels that in the Castlegate and Sunnyside, Utah, mines of his company, the waste of pulverized limestone is reduced to a minimum by this process. Labor costs of dusting also are reduced.

Wet "dusting," which was developed in the Rockies,



High-Pressure Rock Dusting at Hiawatha

Machine being operated by the United States Fuel Co., of Utah. This machine was devised because of the belief that low-pressure application of rock dust is more expensive and less efficacious than application under high pressure. The force of the stream is sufficient to make much rock dust stick to the dusted surfaces.

is making progress too, thus combining in one process the westerners' double confidence in water and inert dust. "Muditing," which started in the Phelps Dodge mines by the use of a cement-projecting machine and which was advanced at Wattis, Utah, by W. J. Reid, superintendent for the Lion Coal Co., who greatly cheapened the process with a new sprayer of his own invention, is getting wider attention.

The Reid mud sprayer, which succeeds in filling every crack and crevice in roof, ribs and floor, and which washes down coal dust to the floor and agglomerates fine coal with the mud, has been viewed by most of the coal-mining people of the West. The general conclusion thus far drawn by them is that the scheme is a decided success for dry mines and that an occasional coating of mud is good for any mine as it seals up dust-catching holes and cracks and rounds off projections where coal dust might settle.

Mr. Reid set out last September to prove the efficacy of mud by experiments in a 50-ft. length of corrugated iron pipe. This did not prove practicable. Today exhaustive experiments are progressing in an entry 5 ft. wide, 7 ft. high and 250 ft. long that has been driven from the outcrop into a seam of coal about 50 ft.





**Another View of the Hiawatha Rock-Dusting Trip**

A portable compressor is mounted on a mine-car truck, an injecting device is installed as in the use of a sand blast, and two cars of fine dust are taken along. The outfit then is drawn through the mine against the air, and three men—motorman, nozzleman and assistant—do the mine dusting with reasonably high speed.

below the seams in which the Lion Coal Co. is working at Wattis.

## Engineers Hear How Coal Firm Entered Power Business

Electrical Engineers of Lehigh Section Hold Big Session and Discuss Power and Load-Factor Betterment

**H**OW a coal company formed the largest public-utility electric plant in the northeastern part of Pennsylvania and one that uses more anthracite than any other plant in the world, was the dramatic story of G. M. Kennedy, electrical engineer, Lehigh Coal & Navigation Co., at a meeting of the Lehigh Valley Section of the American Institute of Electrical Engineers held Nov. 21 in the Schuylkill County Country Club, near Pottsville, Pa.

Never in the history of the anthracite region has such a large and representative group of electrical engineers gathered together. Nearly 300 were present, some being coal-company officials and others representatives of public-utilities.

The main feature of the evening was the address by G. M. Kennedy. He told the early pioneering history of an electric light and power company which, fostered by his corporation, has now a leading part among such institutions. Early in 1905 the Lehigh Coal & Navigation Co. installed a plant to operate lights and a few mining machines and to supply energy to towns near Lansford for light and electric-railway systems. By 1910 the plant was inadequate, so large had become the demands for power. Consequently plans were laid for the Hauto plant.

Though the Pennsylvania Power & Light Co., the present owners of the plant, have a general load, about 60 per cent of the total demand is for mining. The load curve of the power company is so largely influenced by the demands of the coal companies it serves that it shows all the characteristics of the load curve of an anthracite mining plant. Between 10 and 11 o'clock in the morning the load is heaviest. During the night the load is nearly uniform, due mainly to the pumps, slight variations being introduced by the use of the power for street and residence lighting in the various towns served by the company.

Much about electric transmission and power use was

The intention is to sprinkle roof, walls and floor with water and place 1 lb. of coal dust per lineal foot throughout the whole length to determine the explosibility of Wattis coal dust. Then the entry will be reloaded with coal dust and given one coating of mud. If this explodes, two coatings of mud will be applied and the test run again. Mr. Reid does not believe the first coating will permit an explosion but if it fails to do its job, and if two coats fail, then he will install rock-dust barriers along with mud applications, and so on until he knows positively what protection his mud-spraying method will give.

Some scheme of spraying mud may soon be adopted by many mountain mines on main entries in order to give such passages a non-combustible coating similar to that provided by cement but much cheaper. This, with the lavish use of water at and near working faces, and with dry dust blown through side entries and rooms at high pressure, is the combination of protective systems which the West is adopting swiftly and which has developed out of the long years of study the West has given the subject.

learned during the pioneer work of the coal company. When old equipment had to be replaced, electricity was given an opportunity, and it soon proved that it had many advantages. Even the manufacturers learned much while this process was in operation. The electric loads soon became so large that the rupturing capacity of switches came to have a real meaning. When switches failed under less than their rated rupturing capacity, manufacturers were compelled to make further researches and better their designs.

"Power-factor correction has become a real problem," said Mr. Kennedy, "but it is a regrettable fact that the power companies have attacked it in an unsatisfactory manner. The penalty clause in the power schedule should be eliminated. When a power company approaches a customer with a penalty clause in its contract, it appears to be carrying a chip on its shoulder. The power purchaser feels it is seeking trouble."

But because power-factor correction is a vital matter we must not overlook the importance of the regulation of the load. Also, much can be done by coal companies to better their load factors. At one mine of the Lehigh Coal & Navigation Co. by careful adjustment the load factor was increased from 34 to 51 per cent.

Conditions at no two mines are alike but the accompanying figures showing the quantities of energy used for the various operations at some of the Lehigh Coal & Navigation Co.'s mines are interesting.

### Energy Requirements, Lehigh Coal & Navigation Co.

Use	Kw.-hr. per Ton
Locomotive haulage .....	1.5 to 3.3
Ventilation .....	1.5 to 4.5
Pumping .....	2.0 to 8.5
Hoisting .....	1.0 to 1.5
Breaker .....	3.2 to 6.0

The new Coal-dale breaker of the Lehigh Coal & Navigation Co. requires about 241,000 kw.-hr. per month. Usually about 10,000 kw.-hr. of electrical energy are required per month for lighting.

Other speakers at the meeting were M. G. Reinicker, superintendent of operation of the Pennsylvania Power & Light Co. and C. M. Gassaway of the East Penn Electric Co. Both of these men spoke of their work in its relation to the generation and distribution of energy to coal-mining companies. W. H. Lesser, electrical and mechanical engineer, presided at the meeting.





*Stripping Electrically*

## Stripping a Twice-Worked Anthracite Basin

Modern Machinery Makes Total Recovery Possible—Surface Removed from Old Mine Workings—Giant Electric Shovel Used—Ward-Leonard Control Employed—Automatic Dump Cars Make Quick Work of Spoil Disposal

BY FRANK H. KNEELAND  
Associate Editor, *Coal Age*, New York, N. Y.

**I**N MANY localities throughout the anthracite region may be found coal properties that were considered as being worked out long ago and were accordingly abandoned. With the lapse of years not only have improved methods and means of working being enhanced but the value of the product has been greatly enhanced. As a result, many properties that were formerly worked by underground methods are now being reopened by stripping.

Such an operation is that the Cranberry Creek Coal Co. in the Crystal Ridge basin of the Mammoth coal bed, near Hazleton, Pa. This stripping eventually will be 2,700 ft. long and about 500 ft. wide. The maximum depth to the top of the coal or the greatest thickness of cover to be removed will be approximately 165 ft., and the minimum thickness of cover will be 95 ft. The total volume of overburden to be removed will aggregate about 4,000,000 cu.yd. Approximately 90 per cent of this spoil will consist of hard sandstone and fine conglomerate and the rest will be made up of surface soil, clay and drift. It is estimated that it will require five years to remove the overburden and extract the coal.

Prior to 1911 both outcrops of this basin were stripped to a depth of approximately 40 ft. The bed now being uncovered is about 25 ft. thick, and pitches at a maximum inclination of about 45 deg. It received

"Do it electrically" is a slogan that has recently been applied to coal stripping as may be seen in the headpiece. The giant shovel is shown making the first cut in the Crystal Ridge stripping near Hazleton, Pa. It will require about five years and the removal of approximately four million cubic yards of overburden to complete the job.

its "first mining" long ago. Much coal, however, yet remains in the old pillars as well as in the tops of the old rooms or breasts.

In order to strip this coal efficiently new equipment of modern type has been purchased. This consists of a huge electric shovel, three 40-ton saddle-tank steam locomotives, seven 30-cu.yd. automatic air-dump steel cars and five 6-in. electric well drills. These latter machines are employed in putting down shotholes by means of which the cover is blasted loose so that the shovel may handle it. Even after this preparatory blasting, however, the stripper has to do the hardest kind of digging.

### ELECTRIC STRIPPER IS A VERITABLE GIANT

Interest in this stripping centers in the big Bucyrus, full-revolving, electric shovel employed. This is one of the largest machines of its kind yet built and the first electric coal stripper to be employed in the anthracite region. Some of the more important dimensions of this shovel are as follows: Capacity of dipper (struck measure), 6 cu.yd., (heaped measure), 7½ cu.yd.; length of boom (lower end to center of hoisting sheave), 85 ft.; length of dipper handle, 58 ft.; maximum height of dump above rail (boom at 45 deg.) 65 ft.; approximate working weight, 760,000 lb.; dumping radius at maximum dumping height, 94½ ft.; maximum dumping radius (dumping height 48 ft.), 97½ ft.; radius of cut (at 40-deg. elevation of lip), 101½ ft.; radius of cut at bottom of pit, 59 ft.; radius of rear end of revolving frame from pivotal center,



33 ft. 4 in.; overall width and length of revolving frame, 20 ft. 1 in. x 49 ft. 8 in.; height of A-frame above top of rail, 50 ft. 2½ in.; size of lower frame (center to center of main girders), 30x30 ft.; diameter of roller circle, 30 ft.; number of rollers, 84; diameter of rollers, 10½ in.; pitch diameter of rack gear on lower frame, approximately 26 ft. 9 in.

The base of this machine, which, as has been stated is 30x30 ft. in plan, is mounted on four propelling trucks, or one at each corner. These are of the four-wheel equalizing type, all the wheels being double-flanged drivers. Three-point suspension is provided, two trucks being attached to the base directly and the other two supporting an equalizing beam that is attached to the base at its center. An even distribution of load on the trucks is thus obtained.

Jackscrews are attached to either end of the equalizing beam immediately above the truck centers. When the shovel is in operation these screws are tightened between the truck and a plate on the shovel base, thus relieving the equalizing beam of excessive load. When the shovel is to be moved these screws are slacked off leaving the trucks free to follow any irregularities of the track.

Power for propulsion is transmitted through a vertical shaft extending downward through the pivotal center of the machine and geared to the shaft of the hoist drum. A jaw clutch engages or disengages the propelling mechanism. The vertical shaft drives a horizontal transverse shaft beneath the base, which at its extremities carries double chain sprockets provided with jaw clutches. This arrangement permits the driving of all trucks or those of one side only. Chains connect these sprockets with the intermediate shafts of the trucks. These chains are of the pin-and-bar type and have a positive grip on the sprockets.

#### TRANSMISSION MADE BY ALTERNATING CURRENT

Three-phase alternating current is brought to this machine at 2,200 volts by means of suitably insulated cables passing over the side of the bank and thence down into the open cut. At the center of rotation of the upper frame of the shovel suitable collector rings are installed. These are provided with brushes and serve to conduct the current from the stationary base to the revolving superstructure. These rings are adequate for the purpose intended and readily accessible for inspection.

Upon entering the machine current is passed through a Ward-Leonard controlled motor-generator set which furnishes direct current to the hoist, swing and thrust motors. This machine is a direct-connected five-unit set mounted in the rear end of the revolving frame. It is so designed that it will operate successfully, even when the shovel is working on a considerable grade. This set is driven by a 435-kva. 0.8-power factor synchronous motor, directly connected to and mounted upon the same bedplate with the hoist generator which is rated at 150 kw. and 250 volts direct current. This latter machine is fitted with differential compound windings. The exciter, which is also direct-connected, is rated at 20 kw. and 125 volts. This machine is flat compound-wound. The swing and thrust generators rated at 75 and 50 kw. 250 volts direct current respectively, both differential compound-wound, are mounted on a separate bed plate but are driven through a flexible coupling.

Three 7½-kva. single-phase transformers supply low-voltage alternating current to a small air-compressor

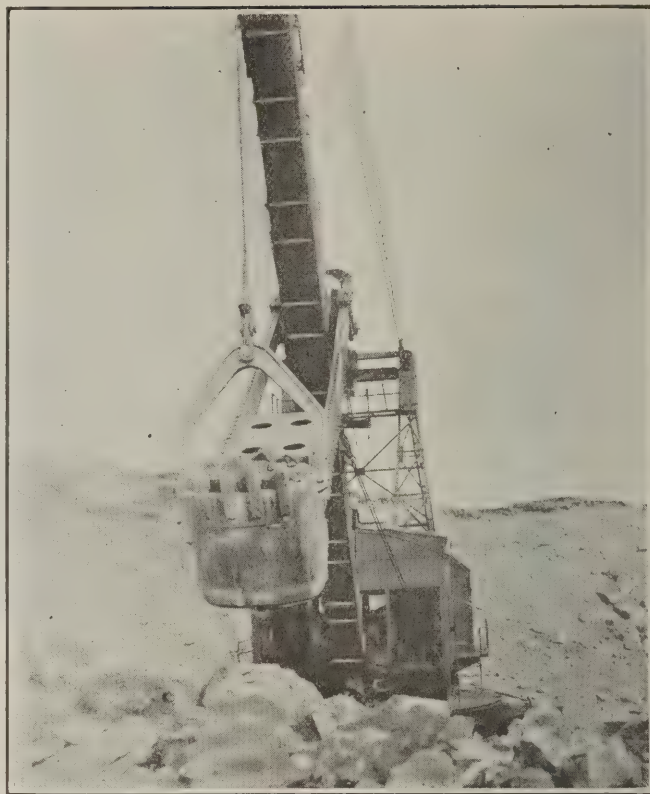


Fig. 1—Six Cubic Yards at One Dip of the Bucket

An idea of the kind of material that the shovel must handle may be gained from the rocks in the foreground. Despite the sturdy construction of the dipper the renewable points of the teeth are occasionally torn off by the severe digging.

motor, to the dipper-trip motor and to the lights carried on the revolving frame.

The main hoist is driven by two motors each of 225 hp. The main hoist cable is single, of 2½-in. diameter and is wound on a grooved drum, machined to a pitch diameter of 54 in. This drum is of sufficient length to permit the hoist rope to be wound to the highest position of the dipper without exceeding a single layer. The drum carries two outside friction bands lined with basswood blocks. These frictions are operated by an air cylinder.

The mechanism operating the lowering brake is controlled automatically by means of a spring, an air cylinder and a magnet valve. This, however, does not prevent the brake from being applied by means of a foot treadle.

The swinging motor drives a vertical shaft through two spur- and one bevel-gear reductions. A spur pinion on this shaft engages the swing rack on the base of the machine and a friction clutch protects the mechanism from overload. The second intermediate shaft of this mechanism carries a band brake that is applied by means of a strong spring and is released by an air cylinder.

On this shovel the boom is built up of structural steel shapes and plates and is of the box-girder type. It consists of heavy angles at the corners connected on all four sides by plates. Diaphragms are placed at suitable points along its length to afford torsional strength. At its lower end heavy steel-casting feet, securely riveted to the plates and angles, are provided. Wire guy ropes extend from a point near the center of the boom to the outer sills of the revolving frame. The boom is provided also with independent safety guys.

The thrust motor, and the intermediate and shipper



shafts are mounted on two steel foundation plates securely riveted to the boom. Two saddle blocks are mounted on the shipper shaft, each straddling a rack pinion and one member of the double dipper handle. These saddle blocks are of heavy design and of the roller type. All this machinery is protected from overload in case of emergency by a slipping clutch. The intermediate shaft is provided with a band brake which is applied by means of a heavy spring and released by an air cylinder.

It has already been stated that the hoist rope is single, and of 2½-in. diameter. The sheave at the point of the boom over which this cable passes is of 90-in. diameter; the groove in its rim is machine-cut and the hub is bronze-bushed.

The boom is suspended by a 12-part tackle and is raised or lowered by means of a drum geared to the main hoisting shaft. This drum is carried on an independent shaft, is actuated by a jaw clutch, and is held by a dog which engages a ratchet wheel when the shovel is in operation.

#### DIPPER AND HANDLE MADE "EXTRA STRONG"

As in many of the large shovels of recent construction the dipper handle on this machine is double. That is, it is composed of two members straddling the boom. These two members are tied securely together at both ends by means of heavy separators, built up of plates and structural shapes. Each member of this handle consists of a wooden beam reinforced with steel bars. The racks fastened to their under sides as well as the pinions meshing with them are nickel-chrome steel castings. The dipper is attached to the extremity of the handle by means of steel hinge castings.

The dipper is of the square-back type, fitted with four center or digging teeth, provided with renewable points. The digging that this shovel has to perform is of the hardest kind, and the dipper is built to withstand the extreme duty and wear to which it will be subjected. Spring buffers are provided on the door hinges to absorb the shocks entailed in dumping.

A somewhat unusual but highly efficient detail embodied in this machine is the equipment used for tripping the door of the dipper. This operation is performed by means of a small totally inclosed alternating-current motor mounted on the under side of the dipper handle. The shaft of this motor is coupled to a drum upon which the trip rope, or in this case a

chain, is wound. To discharge the contents of the dipper, therefore, the shovelman merely closes a switch. This energizes the motor, which in turn trips the dipper.

All the direct-current motors installed on this machine are of General Electric make, designed to withstand the high peak loads, and the intermittent, varying-speed, reversing service incident to shovel operation. They are of steel-mill type with steel-casting frames, split horizontally, and fitted with fire-proof insulation, commutating poles, and series field windings. The frames are of the open type on the hoist and swing motors but of the inclosed type on the thrust motor.

All these motors are controlled by varying the fields of the generators that supply them with current, a separate generator being provided for the hoisting, thrusting and swinging operations. Master controllers manipulated by the shovel runner govern the generator field current, thus varying the speed, torque and direction of rotation of the several motors. The maximum torque of the hoist and thrust motors when the dipper is stalled in the bank, or that of the swing motor when it is accelerating, is limited by the differential field winding of the generators. As the current taken by the motor increases, the series field of the generator builds up, counteracting the shunt field, thus limiting the current taken by the motor. This holds the motor torque to a safe value even when the shovel operator holds the controller handle full on.

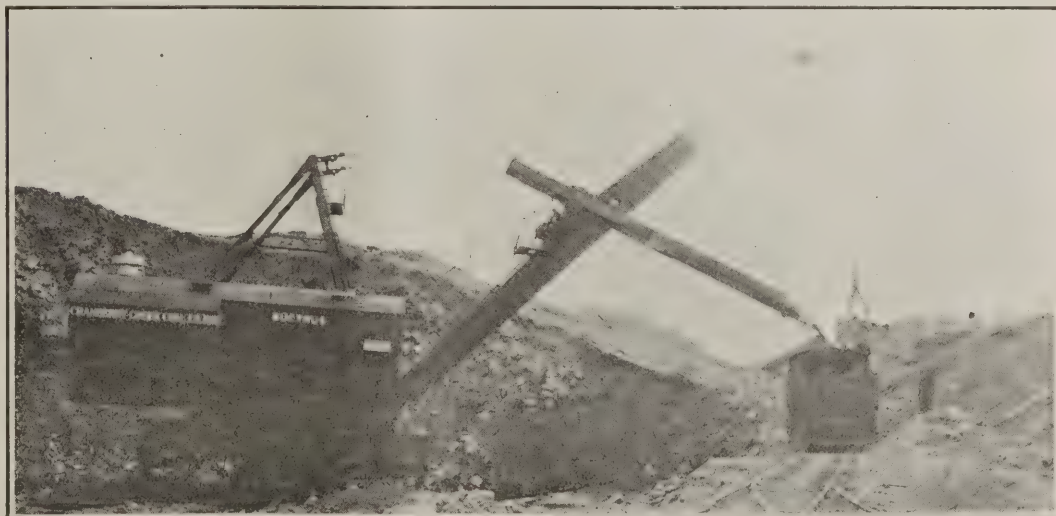
The hoist controller is so arranged that the weight of the descending dipper and handle drives the hoist motor as a generator, thus returning energy to the power line. This arrangement not only saves power and practically eliminates brake wear, but also makes the shovel easy to operate as it obviates the necessity of disengaging the hoist friction, lowering the dipper on the foot brake and then throwing the friction in again when digging is to begin.

All motors are protected against plugging or reversing, so that the machine cannot be jerked or the commutators damaged should the operator reverse the motors while they are running. All brakes are controlled by the motor controller handles through magnet valves. Thus any brake is set when its controller handle is in the off-position. The brake is released when the handle is thrown to either forward or reverse running position.

FIG. 2

#### Loading a Trip

Spoil may be placed on the car 187 ft. horizontally from, and 65 ft. above, the point from which it is dug. As shown, the dump cars may thus be spotted well back on the wide berm, provided alongside the shovel. This is an excellent feature where the ground is loose and the track accordingly uncertain.





An emergency trip is provided. Thus the shovel runner can apply all brakes and "kill" all generator fields almost instantly by pushing a conveniently located button. An alternating-current motor-driven compressor of about 25-cu.ft. per minute capacity, fitted with reservoir and governor, furnishes air for the operation of the various clutches and brakes. The pressure carried is about 90 lb. per square inch.

The lighting equipment comprises two flood lights, so mounted as to illuminate the operations of the dipper, and a number of smaller lamps lighting the interior of the shovel house, the various machinery units, the outside platforms and the area immediately surrounding the machine. A portable lamp with extension cord is also provided. All light wiring is in conduit, and 110-volt bulbs are used. So far as possible all electrical conductors are run in conduit.

Spoil dug from the bank is discharged into Clark automatic air-dump cars, each of 30-cu.yd. capacity. Each of the 40-ton locomotives can handle two of these cars per trip. It normally requires from five to seven dips of the shovel to fill a car. These cars and locomotives operate over standard gage (4 ft. 8½ in.) tracks laid with 80-lb. rails. The maximum distance the spoil is hauled will not exceed two miles and the steepest gradient traversed will not exceed 2½ per cent.

Arrived at the spoil bank both cars of a trip are dumped almost simultaneously by one man who merely throws a small lever or cock upon each car. Fig. 3 shows two cars in the act of dumping. Compared with the small hand-discharged contractors' side-dump car, used even today at many stripping operations, these cars represent a big step forward.

This Crystal Ridge stripping offers a good example of how coal deposits, or what is left of them, are today being reclaimed through the use of modern equipment. This basin of coal was first "worked out" by underground methods and abandoned. Next the outcrops were worked by steam shovel and after these machines had gone as far as their economic limits would permit the deposit was again abandoned. Now comes the big electric shovel by means of which all the coal left by the earlier methods—which forms a goodly portion of

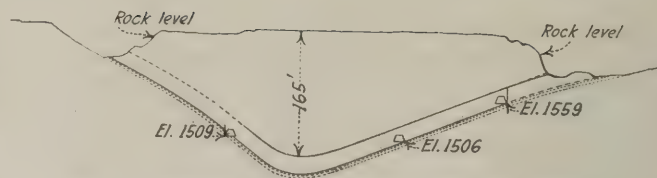


Fig. 4—Shovel Is Excavating a Natural Basin

Like most of the coal beds in the anthracite region, that at Crystal Ridge is folded. The crop has already been stripped and the rest of the coal has been partly worked, but much of it still remains and it is profitable to remove as much as 165 ft. of cover to get at it, as the bed is 25 ft. thick, and the product will be that luxury coal, anthracite.

the original deposit—will be reclaimed. This is true conservation. The same means and methods that are used here doubtless can be applied to many other coal basins throughout the anthracite region and elsewhere.

### Experiments on Rope Testing Progress

Investigations are being actively prosecuted into the fatigue of ropes by the U. S. Bureau of Standards, says the annual report of the Director. An advisory committee composed of representatives of national technical societies, Government departments, and large users and manufacturers of wire rope was organized and has been of great assistance in outlining the investigation.

The method which appeared to be most promising is that of magnetic analysis. This method has received much study as a nondestructive means of testing iron and steel products, but it was at once recognized that no magnetic means has yet been developed which gives results that are unambiguous and capable of definite interpretation. Therefore it was necessary to make investigations of a basic and fundamental nature to establish the relations between the magnetic properties of wires used in wire rope and the effect of the various causes of deterioration in wire rope in service.

A study of the effect of mechanical stress on the magnetic properties of steel wire has been completed and is nearly ready for publication. An investigation of the effect of wear is nearly completed, and work is in progress on the effects of fatigue and corrosion. Apparatus for field tests of rope is being designed and constructed.



FIG. 3

#### Over She Goes!

Two 30-cu.yd. car loads of spoil are being dumped simultaneously by one man who merely throws two small levers. This operation is in marked contrast to the discharge of a trip of small hand-operated dump cars such as are still in use at some strip-pings. The height of the car above the rail makes the rock fall some distance from the track making it possible to keep the ties well back on the solid.



# One Company Meters Its Loads at a Common Point Cutting Electric Bills 19 per Cent

Distribution Lines Have Their Peak Loads at Different Times, Hence, When Energy Is Measured at a Central Point the Combined Demand for Power Is Relatively Steady, Earning the Company a Better Rate

BY A. MACDONALD

Chief Engineer, Keystone Coal & Coke Co.,  
Greensburg, Pa.

**T**ODAY, MOST COAL operators admit the economy of purchased power, but many let it go at that, apparently not realizing the possibilities of what can be done at their end of the line toward cutting their power costs. The Keystone Coal & Coke Co., of Greensburg, Pa., has made surprising reductions in cost by giving close attention to the utilization of electric power and by a unification of distribution lines so as to be able to take advantage of a central metering point.

Definite figures cannot be given of the savings which the various changes hitherto made have effected because the present methods of keeping records have grown up rather than been inaugurated at a definite date. However, on the new distribution system concrete figures are available, and the officials are quite certain that an average saving of 19 per cent in monthly power bills has been made. In a field where power costs can be expected to run as high as 18c. per ton this saving is no insignificant sum.

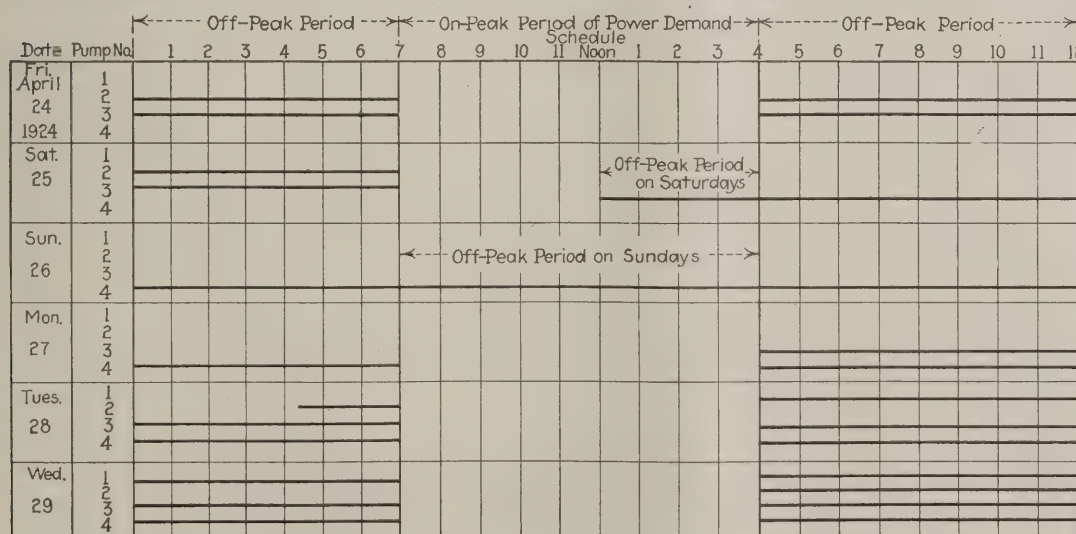
It was made possible by an arrangement, which the coal company completed last April, which provides for a central metering point at which is measured all the power purchased for the operation of its mines in the Greensburg basin. Formerly the monthly bills were computed from readings of six metering stations connected to 2,300-volt lines. Now all power is purchased at 25,000 volts and is metered at one central point. To make this change a large investment was made to install a new 25,000-volt distribution line and new switching, metering and transformer equipment. However, the rate of return on this investment is such as to make the installation stand out as an example of what can be done by taking advantage of wholesale power rates.

When considering the changes necessary for establishing a central metering point a careful estimate of the possible saving was made. After an exhaustive study of the demand charts of the six existing metering stations had been made it was estimated that the new arrangement would make possible a reduction of 17 per cent in the total power cost. The fact that this figure is so close to the saving of 19 per cent actually made indicates the accuracy with which such results can be predicted when dependable information such as that supplied by meter charts is available.

Power for this group of mines in the Greensburg field, and also for the other operations of the Keystone Coal and Coke Co., is purchased from the West Penn Power Co. The bills are computed according to Schedule J which is about the last word in rate making as based on the many and varying conditions affecting the cost of power delivered to the customer.

This schedule, allows a premium to customers who co-operate with the power company by helping it to reduce line losses and the equipment investment necessary for the delivery of power in such quantity and at such times as is desired. The company can do this by improving the power factor, reducing the instantaneous and 15-min. demands, controlling the load so as to hold down the demand during certain periods of the day and by concentrating loads and thus co-operating with the public utility company.

The new 25,000-volt central metering station is equipped for a capacity of 6,000 kw. To date the highest peak load has been 2,500 kw. However, at present, with the mines operating at approximately 55 per cent capacity, 195,000 tons per month, the 15-min. demand is only about 1,800 kw. The new metering station is located at Crows Nest mine, which is near the center of



## Visualizes Load

The heavy lines represent the periods of the day when each pump is in operation. This graph was made from the information reported from the Hannastown mine. When the graph is made it quickly shows the length of time each pump was in service. It is easy to detect which, if any, pumps are running during the on-peak period of the day. Note that on Saturday afternoon and all day on Sunday the pumps may be operated without being considered on-peak load.



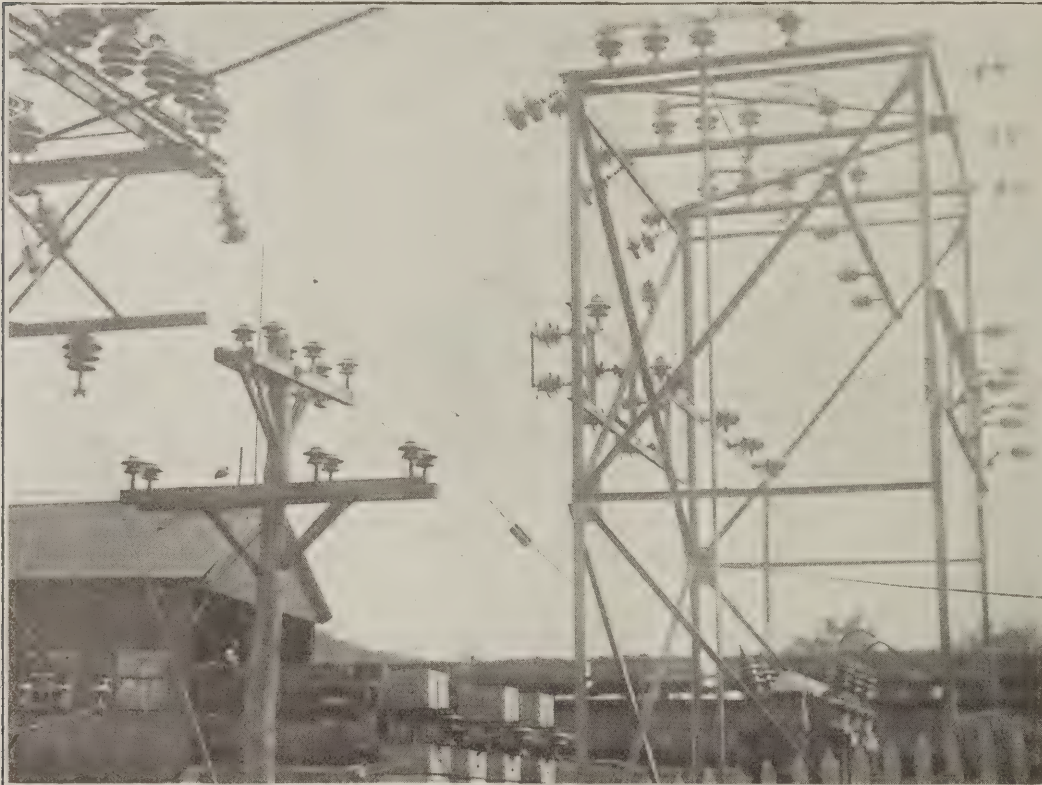
the Greensburg basin and therefore at the most advantageous point for the six operations served.

A noteworthy feature of the installation is the fact that the coal company also has its own set of meters, these being connected at the same point in the 25,000-volt line as those of the power company. There are two reasons why the coal company should have its own meters. Not only does it have the satisfaction of having a check on those of the power company, but by this provision it is enabled to have desirable charts and records for study.

The two sets of meters are mounted in weatherproof cast-metal boxes, installed out of doors on a concrete

former substation. These meters provide a means of determining just what saving is being made by the new arrangement. The combined demand at the common point, which is the billed demand, averages about 25 per cent less than the added demands of the six distribution meters. This reduction is due to the diversity factor, in other words to the fact that the 15-min. peaks of the various mines do not occur at exactly the same time. This 25-per cent decrease in demand is the item which cuts the largest slice off the company's monthly power bill.

The Keystone Coal and Coke Co. has now been operating since last April on the new arrangement and has



#### Where Savings Are Made

The steel tower, arresters and instrument transformers are part of the new 25,000-volt central metering station which has made it possible for the Keystone Coal & Coke Co. to save 19 per cent on its monthly power bills. The transformers and wood pole structure at the left are part of the 25,000-volt to 2,300-volt Crows Nest mine substation.

platform. This platform is at the base of the steel structure which supports the disconnecting switches and choke coils, and on which the instrument transformer connections are made to the 25,000-volt line. The boxes are set on concrete pedestals so that the meters are at a convenient height above the ground. The curve-drawing wattmeter is the most useful instrument that the company owns. It is from the charts of this meter that the average demand for the highest 15-min. load period of the month is obtained. Ordinarily, the maximum-demand records of the coal company and the power company are surprisingly alike. However, differences do occur, and when this happens representatives of the two companies get together and by comparing their charts easily locate the error and adjust the difference.

To distribute the power from the new central metering point at Crows Nest the coal company had to build about 18 miles of 25,000-volt lines. Wood poles and pin insulators are used, and disconnecting switches are installed on each branch. The line is well protected by oxide-film lightning arresters, one set being located at the metering point and one at each of the six transformer stations.

A curve-drawing wattmeter, owned by the coal company, is installed in the 2,300-volt line of each trans-

found that the saving in power will pay for the entire installation in from three to five years, depending, of course, on the mine production.

Fully realizing the desirability of keeping down the maximum demand the company makes every effort to dispatch the loads to the best advantage. About the only really flexible part of the load is that established by the large centrifugal mine pumps. The pumpmen are instructed to see that the sumps are free of water and the pumps stopped before 7 a.m., which is the beginning of the on-peak period of the power schedule.

Except for possibly two or three months of the year, no pumping is done in the day time. In wet seasons, when it becomes necessary to pump during the day, as much as possible is done at periods which do not coincide with the peak loads caused by the operation of cutting machines, mine locomotives, hoists, fans, tipples and washeries.

To be able to check and dispatch the loads it is necessary to have charts indicating the load characteristics of each important machine. Here is where the charts from the demand meters play another important part. The six distribution meters are geared for a chart speed of 3 in. per hour. The main meter is geared to 4 in. per hour. These charts properly show the characteristics of the load on each line.



Hannastown MINE				MONTHLY TIME SHEET FOR PUMPS												Keystone Coal & Coke CO.			
April, 1924																			
Day of Month	Pump No. 1 Gal. Per Min. 1200			Pump No. 2 Gal. Per Min. 2300			Pump No. 3 Gal. Per Min. 2300			Pump No. 4 Gal. Per Min. 3800			Pump No. 5 Gal. Per Min.			Pump No. 6 Gal. Per Min.			Remarks
	Start	Stop	Hours	Start	Stop	Hours	Start	Stop	Hours	Start	Stop	Hours	Start	Stop	Hours	Start	Stop	Hours	
24	A.M.			12:00	7:00	7	12:00	7:00	7										
	P.M.			4:00		8	4:00		8										
25	A.M.				7:00	7		7:00	7										
	P.M.									12:00		12							
26	A.M.											12							
	P.M.											12							
27	A.M.										7:00	7							
	P.M.						4:00		8	4:00		8							
28	A.M.			4:35	7:00	2 <sup>1</sup> / <sub>13</sub>		7:00	7		7:00	7							
	P.M.	4:00		8			4:00		8	4:00		8							
29	A.M.		7:00	7				7:00	7		7:00	7							
	P.M.	4:00		8	4:00		8	4:00		8	4:00		8						

Pumping Reports Like this Are Made at Every Mine. From These Records the Engineering Department Plots a Service Graph

Every mine submits a report showing the time each pump is in operation. All pump men are instructed not to run or even start a pump during the on-peak period of the power schedule. Aside from advantages to the power company there are many advantages to the coal company if it takes on-peak power only for that equipment which must be operated during that period. A pumping load added to the day load of the mines increases the maximum demand charge even if a pump runs for but a short interval of time.

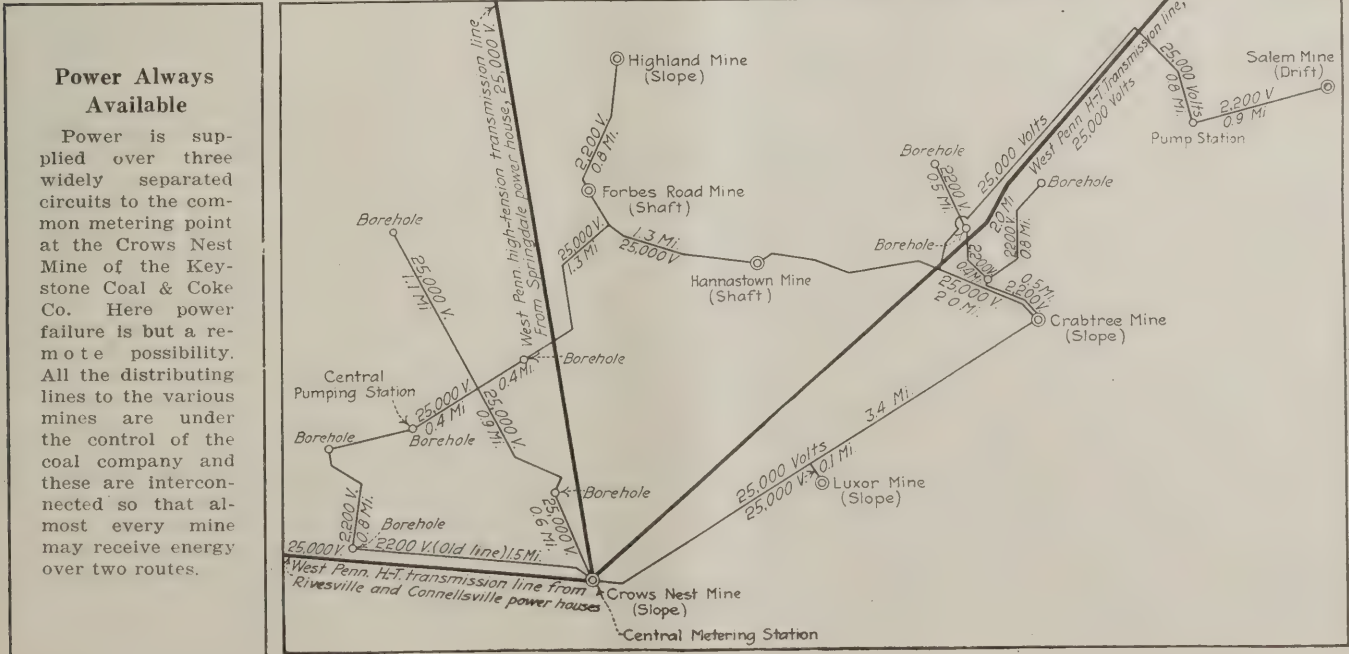
The charts from these meters are used with the daily pump reports for determining if the pumps are responsible for any of the peak loads. The pumping records show the total hours and the exact time of day or night that each pump was in operation. A graph is made of these data, the operating periods of the various pumps being indicated by a series of colored horizontal lines. It requires but a glance at this graph to determine if any and how many pumps were operating at a given time.

In case it is found that a pump was running at the time of a peak load an investigation is made to determine if the pumping was necessary. As the larger pumps are equipped with 400-hp. motors, the operation of any pump shows up clearly on the chart of the respective distribution meter, even though it takes place at the same time as the heavy fluctuating day load. This

fact makes it possible to check at any time the daily reports made by the pumpmen and therefore prompts the men to keep accurate records.

The methods taken by the Keystone Coal and Coke Co. to obtain the most advantageous power rate, and its constant effort to hold down the maximum demand has resulted in reducing its overall cost per kilowatt-hour so as to compare favorably with that of the customers of the West Penn Power Co. having the lowest rates. Low rates, of course, are not the only consideration of purchased power.

The Keystone people report that interruptions are almost unknown. Although the company operates mostly shaft mines, and electricity is used to the exclusion of steam for all drives, such as ventilating fans, hoists, pumps and driving generating units, no auxiliary drives have been found necessary.







Marvel Village, Bibb County, Alabama

## Marvel Plant Largest of Any in Cahaba Field

All Coal Drawn from Steep Slopes—Pitch Near Surface 15 deg.—Vibrating Screens and Tables Used for Cleaning Coal  
—Equipment Provided for Every Ordinary Type of Repair

ONE OF THE leading mines in the Cahaba field of Alabama is that of Marvel, belonging to the Roden Coal Co. The coal which is of the Clark seam is 48 in. thick and lies at the outcrop on a pitch of 15 deg. At a point 5,000 ft. distant from the outcropping the pitch has decreased till it is only 5 deg. It is estimated that the bottom of the basin will be reached 3,000 to 4,000 ft. further in. The coal is a high-volatile bituminous fuel and makes an excellent domestic fuel, of the following analysis: Moisture, 0.57 per cent; volatile, 36.81; fixed carbon, 57.96; ash, 4.66; sulphur, 0.65. Its heating value is 14,200 B.t.u. As the coal has a rash under it and a parting, that at times disappears and at other times is 3 in. thick the screenings have to be washed.

The coal is loaded at the face in  $1\frac{1}{2}$ -ton mine cars. It is hauled by mules to the slope, assembled into fifteen-car trips and hoisted to the tippie. At Mines Nos. 2 and 3 the slopes have double tracks. Coal from No. 3 mine is hauled by a 16-ton steam locomotive over a track laid with 60-lb. rail to the tippie of No. 2 mine.

Here, coal is discharged on a crossover dump into a 20-ton bin from which it is delivered to a plate feeder which in turn delivers it to the main shaking screen, where three sizes are made; 3-in. screenings, 3x6-in. egg and 6-in. fancy lump. The lump and egg sizes then pass over loading booms to railroad cars, the screenings being conveyed to a 1,500-ton coal bin. Under this bin run two concrete tunnels where, on apron conveyors, coal is conveyed to four universal vibrating screens on which the coal under  $\frac{1}{4}$ -in. is removed for washing on two Plat-O and two Deister-Overstrom tables.

The coal between  $\frac{1}{4}$  and 3 in. is washed on two Shannon jigs. After the coal leaves the jigs the  $\frac{1}{4}$ - to 3-in. coal may be remixed with the coal under  $\frac{1}{4}$  in. and loaded as 3-in. steam or it may be passed over a shaking screen, where the 1x3-in. nut is taken out. The  $\frac{1}{4}$ - to

1-in. coal is then mixed with the coal below  $\frac{1}{4}$  in. to make a 1-in. slack. Nut coal, when made, is conveyed by a belt conveyor to a 90-ton bin over the railroad track and rescreened before loading into cars. It is then carried by loading booms and discharged carefully by them into the railroad cars. The ash in the 1-in. washed slack and in the 3-in. steam averages from  $6\frac{1}{2}$  to 8 per cent.

One-inch slack is used in the Wickes vertical water-tube boilers for the generation of steam at the mine. Of these there are three, each of 300 hp. capacity and equipped with Murphy stokers. Natural draft is provided by a steel stack, 150 ft. high and self supporting. Its diameter at the base is 14 ft. and at the top, 6 ft.

At No. 2 mine the coal is hoisted up the slope by a 28x48-in. double engine with an 8-ft. drum having steam-operated brakes, friction and reverse. The hoist at No. 3 mine is a 24x36-in. double engine with a 6-ft. drum having steam friction but brakes which are operated by hand. Two belted Sirocco fans are installed, one of 72-in. and the other of 96-in. diameter. These are belted to 2,200-volt induction motors. To remove the water collecting in the mine three four-stage centrifugal pumps are provided capable of acting against a 436-ft. head, one with a capacity of 280, one of 440 and a third of 570 gal. per minute. Single-drum electric hoists are used for sinking slopes and manways and small triplex pumps, motor-driven, remove the water from the slope faces.

Mine No. 3 has four inclined entries, the two center slopes measuring 7x10 ft. and being used for haulage. The return airways which are placed one on each side of the haulageways measure 6x13 ft.

Permanent construction has been used everywhere. The boiler house, power house, shop and fan house are of brick with steel roof trusses and a tile roof. The washer, tippie and No. 3 hoist house are of steel-frame



construction covered with galvanized corrugated iron. Steel window sash affords copious light. The equipment in the power house outside of the main hoist for No. 1 mine is a 150-kw. and a 225-kw. steam driven 2,200-volt generator with a five-panel switchboard and a 10-ton crane which travels the full length of the building.

The shop contains a 50-ton hydraulic press, a 6x6 power hack saw, a 22-in. x 8-ft. engine lathe, a bolt and pipe machine, a power punch and shear, a 26-in. drill press, a 6-in. pipe machine, a power hammer, an air compressor, a rock-drill sharpener, a band saw, two blacksmith's forges, four emery wheels, a welding and cutting outfit and electric and air drills for wood and metal—quite a complete equipment for a plant only thirty-one miles from a big and well-equipped city like Birmingham. Scrap lengths of round iron are bolt-headed on the drill sharpener by the use of special dies and then threaded on the bolt machine.

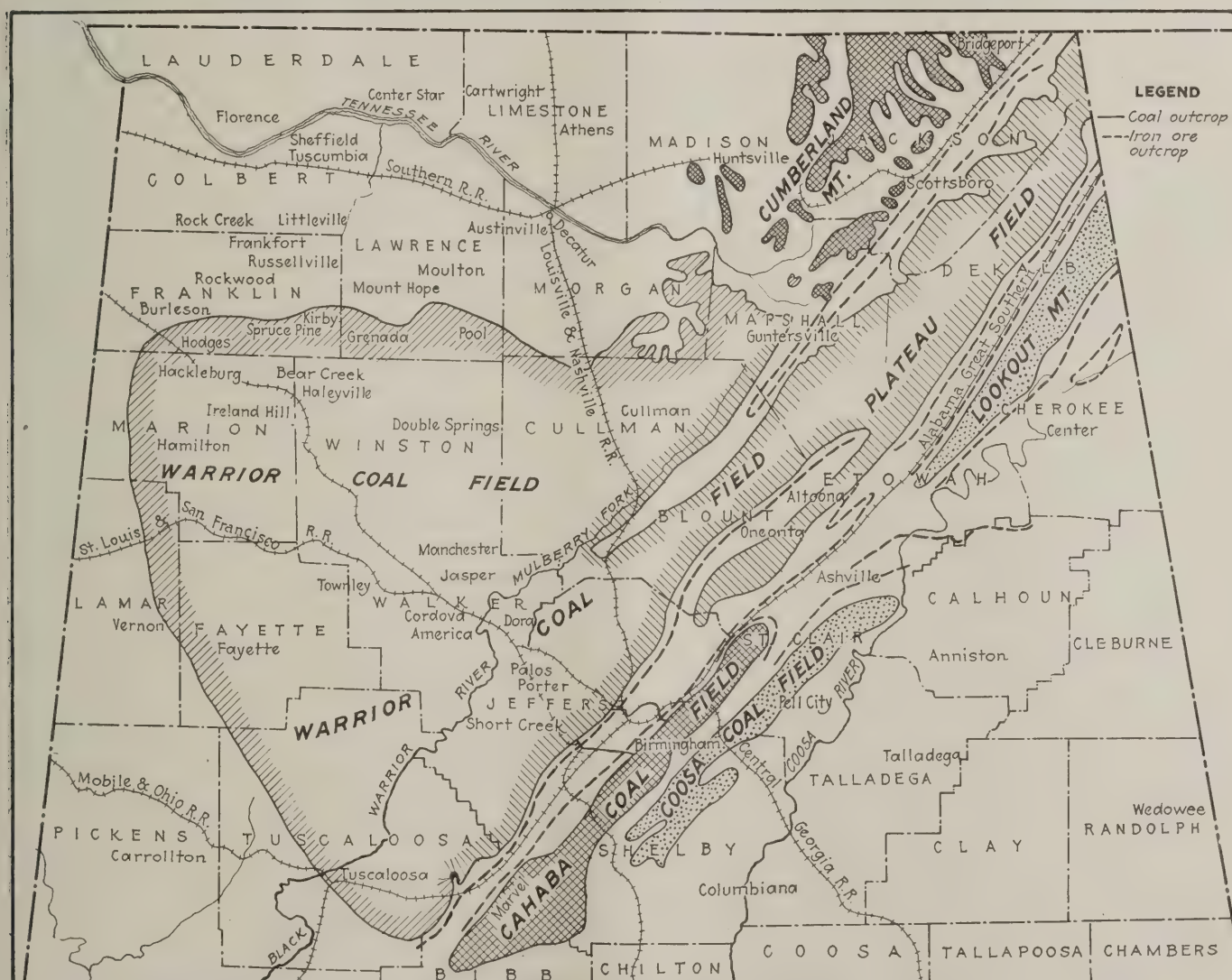
Two supply houses keep the mine free from delays. One house, measuring 28x78 ft. keeps small items in



Company Store at Marvel

This store, which supplies almost every conceivable need to the over three hundred families domiciled in Marvel, measures 60 x 120 ft.

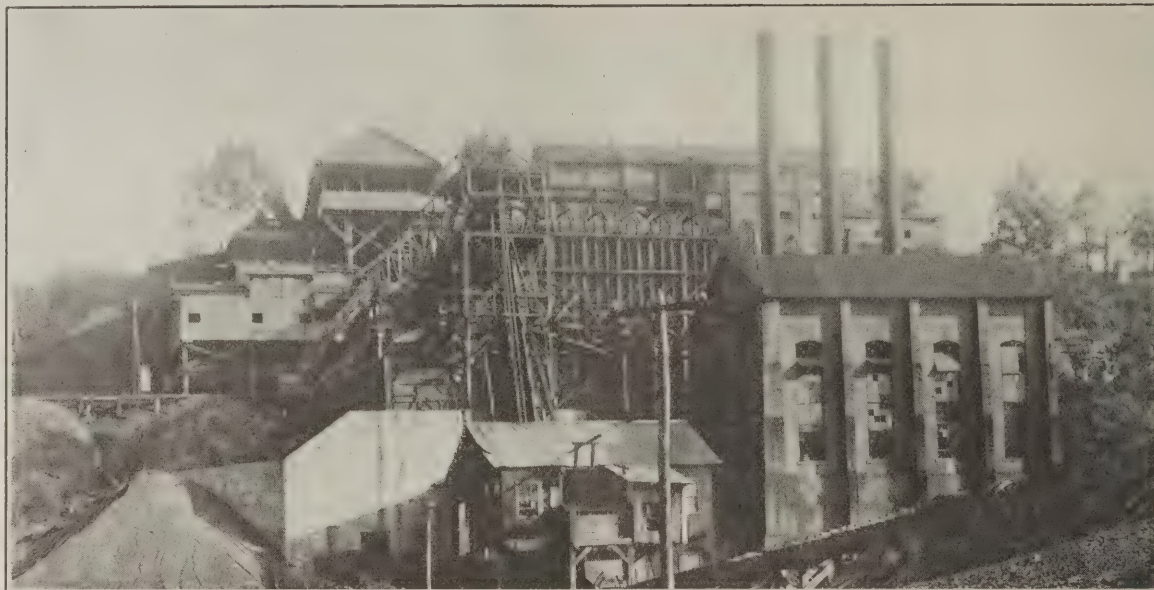
stock, the other, which is two stories high and 48x60 ft. in plan, is used to keep on hand heavy items such as reserve pumps, wire ropes, sheaves, pipe, bar iron, large gears, dwelling-house repairs, such as doors,



#### The Seams in Alabama Lie in Basins the Outlying Edges Often Dipping Heavily

The largest coal field is the Warrior of which the Plateau field forms a part. The latter field, however, has not in general been found profitable to operate. The Coosa field also is little operated. The Cahaba field, in which is the Marvel Mines of Bibb County, has several active mines, engaged in the production of coal for domestic and industrial purposes. It is 68 miles long and 5 to 8 miles wide and it covers a surface area of 39½ square miles. Most of the seams pitch, have a weaker roof than those in the Warrior field and make more water than the seams in the latter field. The mines also contain much methane. In 1923 the tonnage from the Cahaba field was 2,966,505 tons of which 1,198,110 tons or nearly one half was from Bibb County, which lies to the extreme south.





**Tipple and Washer at Marvel. Alabama Mines Are Keen Advocates of Coal Washing**

As all the coal in the Cahaba and Warrior fields has its partings, washing of coal is the general practice. Much aggressive action has been taken. This washer has, for instance, both jigs and tables, the coal between  $\frac{1}{2}$  and 3 in. going to jigs and the still smaller coal being cleaned on the tables. The ash in the 1-in. washed slack and in the 3-in. steam runs from  $6\frac{1}{2}$  to 8 per cent.

windows and roofing, extra motors, spikes, nails, etc. During working hours a supply clerk is in attendance. Supplies are handled solely on presentation of written requisitions and a perpetual inventory is kept.

For the employees 305 dwellings, a 60x120-ft. store and two school buildings, one for white and one for colored children, are maintained by the company. The dwellings have running water and electric lights. The streets have been graded and covered with 6 in. of crushed sandstone and 3 in. of crushed slate from the company's rock-crushing plant which also furnishes crushed sandstone for concreting. All the overcasts in the mine are built of concrete. The stoppings are of brick. As many thousands of cubic yards of concrete have been used, a one-bag motor-driven mixer has been provided, as well as a one-third bag hand mixer for smaller work.

#### WATER SUPPLY OBTAINED FROM SPRINGS

For boilers and domestic supply, water is obtained from springs  $1\frac{1}{2}$  miles from the power house, the water for domestic purposes being stored in a 50,000-gal. concrete tank mounted on a 60-ft. concrete tower. Fire plugs and several thousand feet of  $2\frac{1}{2}$ -in. hose scattered around the town provide fire protection. Non-acid mine water is used in the washer, for strange to say the mine waters of Alabama are unusually free of acidity. A 400,000-gal. concrete-lined reservoir is used to store water for the washer, a 60,000-gal. reservoir provides the water for No. 2 boilers, and a 40,000-gal. reservoir that for No. 3 boilers. The outside water mains are of 4- and 6-in. bell-and-spigot pipe, and all the underground discharge lines are of 6- and 8-in. Universal pipe.

B. F. Roden is president of the company and the active superintendent of its operations. The mines are located on the Louisville & Nashville and Southern railroads.

#### Cauca Valley Coal Convenient to Panama

Four hundred and fifty miles from the Panama Canal in the Department of El Valle is the coal field of Cali, located in the Cauca Valley of the west coast of Columbia, only a few miles inland from the Pacific Ocean. It is connected with the port of Bona Ventura by the Pacific R.R. Cali is the capital of the Department of El Valle.

The region immediately surrounding this city is not well suited for mining, says the *Municipal Gazette* of Cali, but nevertheless its principal wealth consists of coal of which there are extensive deposits. The beds which have been discovered are on the western slope of the Andes Mountains and extend for a distance of more than 52 miles. There is every indication that other deposits exist in the neighborhood which will be exploited some day in the future.

The coal that is now being mined is a semi-bituminous fuel, having the following analysis: Carbon from 68 to 71 per cent; volatile matter, 23 per cent; ash, 5.4 to 7.6 per cent; sulphur, 0.8 per cent. Large quantities of coal are needed not only on the Panama Canal but at many points on the west coast of South America both for railroads and steamers. Practically only in Chile can any native coals be found on the market.

At the present time six coal mines near Cali are being operated, the aggregate production of which is about 3,000 tons per month. Nearly all of this is consumed by the Pacific R.R., the cost to that railroad being \$5.44 per net ton. This production is low because only rudimentary and costly methods of operation are employed, no new or modern machinery being used. With these installed all the steamers which run up and down the west coast of South America could be supplied with Cali coal, and it could be shipped to Peru, Ecuador and Chile, all of which offer a splendid market for this product.



## Engineers of Western Penna. Comment on Rock Dust

May Rockdusting Lawfully Replace Water  
Sprinkling?—Dusting of Shotholes—  
Getting Dust Into Aircourses

**A**T A well-attended meeting of the Engineers Society of Western Pennsylvania, Mining Section, on the evening of Nov. 24, in the William Penn Hotel, Pittsburgh, Pa., a paper on "Rock Dusting in Bituminous Coal Mines," was read by T. G. Fear, general manager of the Inland Collieries Co. Mr. F. A. McDonald presided, and in introducing the speaker said, "In the last fifteen years in this country 215 explosions killed 4,400 men. A thought of these catastrophes in itself is enough to drive any conscientious man to rock dusting."

"Aside from preventing coal-dust explosions, rock dusting," said Mr. Fear, "improves materially underground illumination; it lodges on wood timbers and makes them fireproof and to an extent, protects the roof from the slacking action of the air." Rock dust stemming is advocated in shooting, because it produces more lump coal, decreases smoke and suspends incombustible dust in the air at the instant when the danger is greatest that coal dust will be ignited by a blown-out shot. Of the particles of coal dust brushed from a timber set in the Indianola mine as much as 83.5 per cent pass through a 200-mesh screen. This indicates the explosive quality of the dust. It has been proved that average bituminous coal dust so long as it will pass through a 20-mesh screen is of an explosive character.

Basing his figures on his experience in the Indianola mine, Mr. Fear said a mine producing 61,000 tons of coal per month can rock dust at a cost of two mills per ton applying the dust three times a year; if the rock dust is applied four times a year the cost would be three mills per ton. (These figures apply only to the rock dusting of haulage entries, not aircourses, and assume that the rock-dusting program is well under way.)

In the discussion that followed, W. L. Affelder asked Mr. Fear if he sprinkled the Indianola mine with water before he started rock dusting. "Yes, extensively," said Mr. Fear. "How then," continued Mr. Affelder, "are you going to get around the Pennsylvania mine laws which specify in no uncertain terms that the mine must be sprinkled?" According to T. G. Fear, there must be a way around this difficulty. Illinois operators do not water-sprinkle rock-dusted areas. "Anyway," he interrogated, "isn't rock dusting sprinkling?" Mr. Affelder wondered what the defense would do if a state mine inspector would take a company to court that is rock dusting charging it with breaking the state mining laws.

Mr. Fear thought a state inspector would have no grounds for accusing a company of breaking the law but Mr. Affelder said the present mine laws of Pennsylvania were obsolete, and put the inspector, operator and miner alike in an extremely difficult position. Mr. Fear said that Secretary Walsh intended to endeavor to put a clause requiring rock dusting in the mine law at the next meeting of the state legislature. The Federated Engineering Society has appointed a committee to decide what shall be called standards in practice in rock dusting so that these might be utilized by the members of state legislatures in making mine laws.

A. R. Chambers, of the Michigan Limestone & Chemical Co., said that the cost of pulverized limestone, at the sending end is not high, but the railroad freight rates may be, and usually are. Marble dust has been shipped from Vermont into the Pittsburgh district, but the freight rates made delivery cost prohibitive. His company quarries limestone at the Port of Calcite, 200 miles north of Detroit and ships the screenings by water to Buffalo where they are pulverized and distributed.

Mr. Fear described one of his methods of getting dust on his aircourses. A hole is knocked into a stopping through which a 4-in. galvanized sheet-iron pipe is inserted. One end of this pipe is connected to the distributing machine and to the other end are attached 10-ft. sections of the same kind of pipe to give whatever length is desired. Short sections of automobile-tire inner tubes are sometimes used over the pipe joints. This method works quite satisfactorily.

In a single day twenty samples of mine dust can be taken and tested by the volumeter method to ascertain the percentage of incombustible material, said Mr. Fear. He recommends the use of rock-dust barriers on main return entries in addition to dust floated in on the air-current.

## Air Lift and Mines of Japan Interest Anthracite Engineers at Scranton

**A**T A MEETING held by the Engineers' Club of Scranton, Nov. 25, light was thrown on the unwatering of the Taylor mine and on the peculiar difficulties with which Japanese coal-mining engineers have to contend in their work, the papers being illustrated by lantern slides and diagrams.

Herbert Axford, formerly hydraulic engineer for the Glen Alden Coal Co., and now with the Ingersoll-Rand Co., read an interesting paper describing the use of the air lift at the Hampton Pumping Station of the Glen Alden Coal Co.

Last summer when the Lackawanna River broke into the Taylor mine the water completely submerged the Hampton pumps, located in the Clark bed, and also filled the Dunmore beds Nos. 1, 2 and 3 which are below the Clark.

There was no feasible way to get to the Dunmore beds and install pumps, therefore three air lifts were used. Two of these lifts discharged through 16-in. pipes and the third through a 12-in. pipe. Between April 30 and Aug. 14 these lifts raised 660,000,000 gal. of water from the Dunmore beds to the Clark bed where five 5,000-gal. per minute centrifugal pumps delivered the water to the surface.

J. W. White, manager of the Scranton office of the Jeffrey Manufacturing Co., spoke about his recent trip through the coal fields of Japan. Mr. White's story was well told. He spoke of his personal experiences inside and outside the mines. "Cheap labor and the employment of girls and boys in the mines prevent the extensive use of machinery in the mines of Japan," said Mr. White.

The high temperature—at places it is 90 deg. F.—and the dampness of the mine interior, often near the saturation point, make it extremely difficult to mine coal in Japan. Nearly all the mines are started from the outcrop and there are few mine shafts. One of the mines visited by Mr. White extended about three miles under the sea; another mine he saw has since become a geyser, boiling water now coming up the shaft.





## News Of the Industry



### Brophy Rejects Proposal to Adjust The Jacksonville Wage Agreement; Seeks Curb on Opening of New Mines

Flat refusal is the reply of the executive board of the United Mine Workers of district 2 to the recent letter of the Central Pennsylvania Coal Producers' Association proposing a readjustment of the Jacksonville wage agreement. The union officials disclaim the predictions of prosperity imputed to them in the communication from the operators and declare that the only solution of the problem brought about by the depressed condition of the coal industry in central Pennsylvania is "the development of new coal fields, and the opening of new mines must be checked until the demand and the supply counterbalance." The statement of the miners, which is signed by John Brophy, president; James Mark, vice-president, and Richard Gilbert, secretary, is as follows:

"Permit us to call your attention to the fact that you err in imputing to us the prophecy of 'prosperity' of which you speak in your letter of Nov. 7. To the *Coal Trade Journal* of Aug. 20 belongs that honor. The rôle of prophet has ever been assumed by the operators and not by the miners.

"For instance, in your statement dated April 2 you said it was agreed by many in the business that central Pennsylvania would not produce more than 15,000,000 tons throughout the coal year. However, up to Oct. 18, according to your own figures, we produced 30,670,782 tons.

#### Output Up Despite Gloom

"The *Coal Trade Journal* states on Nov. 12 that 'central Pennsylvania is sharing in the improved conditions in the industry in the country at large; that October loadings amounted to 66,782 cars, proving larger than anticipated and were the largest of the year except January.' Again in the same issue it says 'optimism prevailed in the country's bituminous markets during the past week' and that 'the consensus of opinion was that the next two weeks would see a marked increase in demand and that the worst was over.'

"These statements are more nearly in accord with the facts than such as have been issued periodically by the officers of your association ever since the present contract was signed on March 29 of this year. This contract your association signed voluntarily, yet the ink of the signatures was scarcely dry when you issued (April 2) a state-

ment which could have no effect other than undermining confidence in the contract.

"It is true that when you were questioned as to whether you would stand by the contract you stated (April 19): 'The present wage agreement for a period of three years will be carried out as faithfully by the operators as all preceding agreements.' Yet you have continued to issue from time to time statements carrying prophecies of practical ruin unless there were reductions. Is this an evidence of good faith on the part of the operators or is it an attempt to destroy the contract?

#### Trade Papers Optimistic

"It is true also that there is much idleness and slack work in this district. The miners feel it even more keenly than the operators. But it is not true that this district alone is affected, nor is it affected in greater degree than some of the adjoining districts. Even West Virginia, to which you constantly refer, has been and is far from operating steadily. If the optimism of the coal trade papers should be justified the condition of the industry would still be far from satisfactory because of the overdevelopment which makes slack work chronic.

"The solution you offer for the coal problem—a reduction in wages in this district—seems a simple one. But you are, or should be, just as fully aware of its real significance as are the miners. Should there be made in this district any wage concessions, the operators of all other districts signatories to the Jacksonville agreement would demand, and justly so, the same concessions. The non-union operators would promptly reduce wages still further, and the same relative positions between the districts would obtain. The only change accomplished would be that the miner would have still less money. There would be no more work.

"It is needless to say that District No. 2 is not willing to enter into a competitive wage war which could bring nothing more than increased poverty and desolation to the miner and his family. The early history of this district is replete with wage wars, and the results were always the same—added poverty and suffering for the miners and consequently their communities, and no gain for the operators. It is only since the wage contract has checked cut-throat competition that

#### Will Use Sulphur Gas To Make Ghost Walk

Men of the Coalton mine, at Nokomis, Ill., are looking for a supposed ghost which they say they have seen and that may be the cause of strange lights that appear and suddenly disappear around the mine. St. Louis detectives are looking for Frank Deverick, a former employee of the mine, who is alleged to have stabbed a companion to death in a St. Louis drinking party last spring. Deverick has not been seen since the tragedy and miners of a superstitious nature are inclined to think he may be dead and his spirit hiding in the mine. Officials of the mine are planning to use "sulphur gas" to smoke the ghost out.

even the slightest stability has been known in the coal industry.

"We, the Executive Board of District No. 2, therefore, reject as unsound your solution of the coal problem.

"You ask us what suggestions we have to make to relieve the union miners, the union coal operators and the business interests of the communities in which we reside.

"We reply: The nation consumes only enough coal to supply her needs. Were the miners to produce without pay coal in excess of that amount, the consumption would not increase. We are now supplying sufficient coal to meet all demands, yet work is slack and idleness is widespread in all bituminous districts. This is because there is a large overdevelopment in the coal industry.

"There is only one solution to this problem—the development of new coal fields and the opening of new mines must be checked until the demand and the supply counterbalance. Until this is done and not until then can you hope for substantial, permanent improvement in the bituminous coal industry."

Coal to the extent of 253,612 tons was used in the manufacture of explosives during 1923, according to figures issued by the Bureau of the Census. Similar figures on other industries are as follows: Coffins, burial cases and undertakers' goods, 78,503 tons; nets and seines, 2,833 tons; glass cutting, staining and ornamenting, 14,818 tons; china decorating, not done in potteries, 1,111 tons; sporting and athletic goods, 25,861 tons; straw hats, 21,647 tons; feathers and plumes, 291 tons; professional and scientific instruments, 24,288 tons.



## Mayor Hylan Warns Against Coal Gougers in New York

To prevent suffering and discomfort among the poor of New York City this winter through lack of coal Mayor Hylan directed Health Commissioner Monaghan on Nov. 27 to take the usual steps to see that the poor receive coal this winter and that they are not made the victims of profiteers. The Mayor wrote:

"The cold weather, bringing greater demands for fuel, is the open season for profiteering by unscrupulous retail coal dealers. I feel that the Health Department could help considerably by a check-up of the retail coal dealers in this city, particularly the so-called cellar men. We have heard of no particular shortage of anthracite coal this year, but this is not likely to deter some of the retail dealers from charging exorbitant prices.

"The Mayor's Committee of Women have been carrying on splendid work for the last seven years, issuing priority tickets to the poor and insuring the delivery of small quantities of coal for home purposes. Their work of distribution would be greatly aided if there were some assurance that a proper supervision and regulation were maintained over prices. The Health Department might very properly undertake this work and call upon any other commissioner or department, such as Commissioner O'Malley of the Department of Public Markets, to help in the stabilization of the price of coal.

"Will you, therefore, proceed at this time to make such arrangements as will tend to prevent profiteering in this essential commodity so that the people who must depend upon the purchase of small bags of coal from cellar men and other dealers will not be forced to pay an excessive price to keep from freezing during the winter months."

## Speed Return of Empties To Avert Car Shortage

Traffic officials of the various mining companies on the Louisville & Nashville Ry. system have been meeting with officials of the road to work out a helpful system of routing that would cut down the time on the return of empties for renewed service—this in view of obviating to the fullest extent possible car shortage during the winter. The plan is to leave intermediate routing open whenever possible and let the main routing take the course that will get the car home quickest.

## More Coal Being Stored, Say Purchasing Agents

Notwithstanding the feeling in the coal industry that consumers were not storing coal during October, according to the monthly survey of the National Association of Purchasing Agents the amount of hard and soft coal in the bins of industrial consumers on Nov. 1 was 77,754,054 net tons as compared with 52,458,736 tons on Oct. 1, a gain of 25,285,343 tons. The survey shows that consumption during October increased by more than 1,200,000 tons over the September figures, the reports showing that the larger concerns are using more coal and the smaller firms an even greater increase than in September.

For heating industrial buildings during October the coal used was about 300,000 tons greater than in September.

It is estimated that on Nov. 1 there was sufficient coal in the hands of industrial users to last 66 days, based on the average daily consumption for October.

## Alberta Coal Probe Halts for Collection of Data

After having been in session for a week, the commission recently appointed to make a survey of the coal industry in Alberta has taken one week's recess pending the arrival of certain information from various points in eastern Canada, the United States and England where similar investigations have been conducted in former years. According to H. M. E. Evans, chairman of the commission, there is much preliminary work to be done and non-contentious material to be gathered before witnesses will be heard, but it is hoped to begin taking evidence within a few weeks.

Broad powers have been conceded to the commission for the purpose of collecting accurate information in regard to every branch of the coal industry and these powers will be utilized to the full, it is announced. The scope of the inquiry, according to the original motion passed in the Provincial House last March, will include wages, housing conditions, profits made by companies, coal reserves, systems of mining, grading and inspection and all matters relating to marketing. This latter clause probably will include the matter of the Ontario and Manitoba markets for Alberta coal.

Owing largely to the big railway contracts having been postponed, production is slow among the steam coal mines in the province though the domestic mines are all working steadily. The Mountain Park Colliery has closed down until January, causing much distress among the miners who have been idle all summer owing to the strike. Other mines are working only short shifts until more orders can be obtained.

Prospects for next year, however, are bright and at least one company, the Luscar Collieries, Ltd., is preparing for an increase of business. A modern steel tippie capable of handling an output of 2,000 tons every eight hours is in process of erection in addition to a box loader, a new power plant and an extension to the siding.

## Hayes Loses \$35,000 Suit to Vinton Collieries Co.

An echo of the miners' strike of 1922 in the central Pennsylvania coal field was heard from New York on Nov. 24, when Arthur Garfield Hayes lost his suit in court there against the Vinton Collieries Co., of Vintondale, Cambria County, for \$35,000 damages for alleged false arrest. Hayes was a prominent figure in the 1922 strike and a leader of the miners. When he attempted to hold a meeting in Vintondale he was placed under arrest and fined by a local justice of the peace. Returning to New York he entered suit against the collieries company, alleging false arrest and invasion of his constitutional rights. The case was tried before Judge Franks, who directed a verdict for the defendant company on several counts, passing several others to a jury for determination. The jury held the collieries company not guilty and the case was dismissed.



## New Englanders Inspect Virginia Coal Mine

Some of the twenty New England business men who toured Virginia last month in the interest of commercial reciprocity, just before being taken in mine cars to inspect the Derby Shaft in southwest Virginia. The trip was arranged by the Virginia State Chamber of Commerce in the interest of closer trade relations between the mining interests of Virginia and the big consuming centers of the East and North. On the right hand side, sitting in the first car, are Dr. Joseph H. Smith, president of the Virginia State Chamber of Commerce; Clifford S. Anderson, president of the Associated Industries of Massachusetts; John W. Bray, general sales manager of the Bullard Machine Tool Co., of Bridgeport, Conn.; Romeo W. Miller, of the Bridgeport Crane Co., and Lee Long, vice-president of the Clinchfield Coal Corporation.



## Rate Cut to Northwest in Effect Soon; Will Adjust 15c. L. & N. Differential

An agreement was reached before the Interstate Commerce Commission in Washington, Nov. 26, between representatives of the Norfolk & Western, the Chesapeake & Ohio and the Louisville & Nashville whereby the tariffs on coal for the Northwest which were to have become effective Dec. 5 and 6 will be withdrawn, but the lower rates to the Northwest will go into effect. The tariffs are to be withdrawn so as to allow an adjustment of the 15c. differential which the Louisville & Nashville has enjoyed.

Representatives of the Western lines came home from Washington to carry out the positive suggestion made by the commission that they check out a new basis for joint through rates from Eastern mines to destinations in Western Trunk Line Territory. This rate check was to be held in Chicago Tuesday, Dec. 2. These new rates will be predicated to a large degree on the \$5.40 rate the commission found reasonable for L. & N. coal to the Twin Cities. This means that rates on eastern Kentucky and West Virginia coal will without doubt be somewhat increased to destination points on the Minneapolis & St. Louis, the Chicago Great Western and the Wabash, which previously have been enjoying low L. & N. joint through rates, but will be decreased on other lines. The exact method of determining these new rates has not been determined.

## Instructive Program Planned For Engineers' Meeting

A program to aid the engineer in solving his problems, especially that of trimming operating cost, has been arranged for the fourth annual convention of the West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers, to be held at the Frederick Hotel, Huntington, W. Va., Dec. 12 and 13.

The two-day meeting will open Friday morning, Dec. 12, when F. M. Reigher, electrical engineer, American Coal Co. of Allegheny Co., Bluefield, W. Va., will present a paper, "Rotary Converters as Compared with Motor Generators." Another comparison will be made by N. A. Johnson, chief electrician, Buffalo-Eagle Coal Co., Brae-holm, W. Va., who will discuss "Anti-Friction Bearings as Compared with Plain Type Sleeve Bearings for Mining Machinery." The remainder of this session will be devoted to open discussion on the following questions: "What Can Be Done to Prevent Theft of Rosettes, Lamps and Cord?" "How Should Mine Foremen Co-operate with Mine Electricians so That Both Can Be of Most Value to Their Company or Employer?"

In the afternoon meeting, Byron B. Minnium, of the Electric Storage Battery Co., Cincinnati, Ohio, will discuss "Voltage Control in Mines by Use of



John J. Lincoln

Treasurer, Pocahontas Coal Operators' Association, and general manager, Upland Coal & Coke Co., Elkhorn, McDowell County, W. Va.

Storage Batteries," and F. A. Singer, electrical engineer, Southern Mining Co.'s Interests, Williamsburg, Ky., will describe the "Electrical Department Methods of the Southern Mining Co."

The problem of trimming operating cost will be tackled in the Saturday morning session by J. H. Edwards, electrical engineer, associate editor, *Coal Age*, Huntington, W. Va., who will present a paper: "Reducing Cost by Proper Supervision of Mechanical and Electrical Equipment." After Mr. Edwards' talk the following questions will be presented for open discussion: "How Should Feeders Be Installed in Boreholes?" "What Important Repair Jobs Are Being Done by Electrical Welding?" "How Should Carbon Brushes Be Applied to Flush and Undercut Commutators?" The regular business meeting will conclude the morning program. In the afternoon the members of the association and their friends will inspect industrial plants of interest.

## New York Coal Exporters Charge Alien Plot

J. W. Stinson, attorney for Gano, Moore Co., coal exporters, of New York City, alleges that alien interests inspired the complaint of the Federal Trade Commission against the firm in a reply to the commission Nov. 25. Such aliens now are engaged in litigation with his clients, Mr. Stinson declared, and for that reason he contended that the commission is without authority to institute investigation "upon information or complaint of aliens in company with persons represented to be the friends of agents or of counsel of the commission, but in fact the undisclosed legal representatives of such aliens."

The commission's complaint had alleged that the Gano, Moore Co., Gano Moore Coal Mining Co., and M. Rea Gano, their president, violated contracts for the sale of coal to purchasers in Argentina, by delivering coal of an inferior quality to that specified, or failing to make deliveries of the proper quantities, under the contracts, "thereby tending to bring into disrepute and injuriously affect the entire exporting trade of the United States with and into the Argentine Republic."

Referring to a statement in the complaint that the United States has about three billion dollars invested in the merchant marine and that millions of dollars annually are appropriated out of the public treasury for the purpose of retaining and extending foreign commerce and trade, the Gano, Moore Co.'s attorney denied that this is relevant to the complaint and further denied influence arising from this allegation.

Wilful or negligent default from the terms of the contracts with Argentine purchasers also was denied on behalf of the respondents, and none was admitted except such as were beyond their control. "Full, reasonable and substantial performance ultimately has been given notwithstanding such circumstances and heavy loss to the respondents in pursuance of contracts whose mutual consensus imposes still unfulfilled obligations upon the purchasers," the commission was informed.

## Coal Produced Per Man and Average Number of Days Worked Per Year by States in 1921, 1922 and 1923 (a)

	1921			1922			1923		
	Days Mine Worked	Average Tonnage Per Year	Per Day	Days Mine Worked	Average Tonnage Per Year	Per Day	Days Mine Worked	Average Tonnage Per Year	Per Day
Alabama.....	166	487	2.93	215	647	3.01	232	680	2.93
Arkansas.....	112	340	3.03	81	269	3.32	97	329	3.39
Colorado.....	164	628	3.83	191	740	3.87	174	774	4.45
Illinois.....	152	729	4.80	120	606	5.05	158	795	5.02
Indiana.....	128	622	4.86	110	571	5.19	136	738	5.43
Iowa.....	148	398	2.69	131	334	2.55	181	498	2.75
Kansas.....	137	422	3.08	125	377	3.02	149	504	3.38
Kentucky.....	152	625	4.11	140	684	4.89	152	735	4.83
Maryland.....	120	392	3.27	101	318	3.15	178	608	3.42
Michigan.....	196	516	2.63	162	429	2.65	222	593	2.67
Missouri.....	166	415	2.50	113	326	2.88	155	477	3.07
Montana.....	143	654	4.57	140	704	5.03	179	896	5.00
New Mexico.....	150	536	3.58	216	779	3.61	216	708	3.28
North Dakota.....	194	813	4.19	175	769	4.39	182	837	4.60
Ohio.....	134	617	4.60	100	492	4.92	150	742	4.95
Oklahoma.....	141	380	2.70	114	356	3.12	133	398	2.99
Pennsylvania:									
Anthracite.....	271	567	2.09	151	349	2.31	268	592	2.21
Bituminous.....	151	609	4.03	154	592	3.84	213	882	4.15
Tennessee.....	154	431	2.80	163	422	2.59	183	536	2.93
Texas.....	139	336	2.42	185	389	2.10	178	484	2.72
Utah.....	151	922	6.10	204	1,057	5.18	160	1,077	6.73
Virginia.....	166	628	3.78	198	779	3.93	212	832	3.92
Washington.....	159	560	3.52	194	575	2.96	213	680	3.19
West Virginia.....	149	715	4.79	143	729	5.10	169	919	5.44
Wyoming.....	167	849	5.08	128	659	5.15	192	1,004	5.23

(a) Compiled by U. S. Geological Survey. (b) See p. 647 of Coal in 1919, 1920 and 1921 for explanation of this figure, which though correctly computed is misleading.



## Hoover Asks Clear-Cut Ruling on Activities of Trade Associations; Reviews Work of His Department

Herbert Hoover, Secretary of Commerce, in his annual report, made public Nov. 27, appeals for clarification of the laws affecting trade association activities.

"It is imperative," said the Secretary in referring to trade associations, "that some definition should be made by which an assurance of legality in proper conduct can be had and by which illegality or improper conduct may be more vigorously attacked.

"Any collective activity can be used as a smoke screen to cover conspiracy against the public interest, but that is no reason for condemning all collective activities. Just because automobiles are sometimes used by bootleggers for the illegal transportation of liquor we do not prohibit their manufacture or their use."

Elimination of national waste is urged by Mr. Hoover. Under this heading he reviews the accomplishments of the department during the first three years of the present administration, notably in the field of unemployment, seasonal construction, coal, superpower, standardization, simplified practice, co-operative marketing and the reduction of housing costs.

### Trade Bodies Cut Waste

In the section of the report dealing with trade associations Mr. Hoover says:

"One of the most important agencies through which the elimination of waste may be promoted is the trade association. It is true that a small minority of these associations have been in the past used as cloaks for restraint of trade by such activities as open-price associations and other attempts to control distribution or prices. It is equally true that the vast majority of trade associations have no such purpose and do no such things. The dividing line, however, between what activities are in the public interest and what are not in the public interest is not today clearly defined either by the law or by court decision.

"In consequence of recent decisions of the courts many associations are fearful of proceeding with work of vital public importance, and we are losing the value of much admirable activity. At the same time we are keeping alive the possibility of wrongful acts."

Turning to the bituminous coal industry the report says that investigations made early in the present administration revealed the high instability of this industry and the fact that it was functioning at great national loss. Of accomplishments in this field Mr. Hoover says:

"Through co-operation of trade associations of the principal industrial consumers, through chambers of commerce and public utilities a large amount of regular summer storage has been induced. Through the fine co-operation of the railways greater equipment and terminal facilities have been provided and car shortages have been largely

eliminated. Through co-operation by the department with the unionized operators and with the leaders of the United Mine Workers a long term agreement has been entered upon, which insures industrial peace in the industry."

The program of the Northeastern superpower committee, under Mr. Hoover's chairmanship, is discussed as another effort in the direction of waste elimination.

### Mine Guard System Enjoined By West Virginia Court

An injunction against employment of "mine guards" by Don Chafin, Sheriff of Logan County, West Virginia, was issued Nov. 22 by Judge A. P. Hudson, of the Kanawha County Circuit Court.

Besides Sheriff Chafin, the injunction is directed against Circuit Court Judge Robert Bland, of Logan; Prosecuting Attorney John Chafin, of Logan; W. F. Farley, Johnson Queen and P. M. Toney, the Logan County commissioners; C. L. Estep, Assistant Prosecuting Attorney, approximately 250 deputy sheriffs and about 50 Logan County coal companies.

The order restrains the Sheriff, County Court and other officials from appointing deputies to act as watchmen for private individuals or corporations, and restrains the coal companies from paying money directly or indirectly to the deputies for any services to coal companies or to Sheriff Chafin.

### Indiana Consolidation Talk Is Revived

The long-discussed movement to consolidate the coal mines of District No. 11, which includes the entire Indiana bituminous coal field, is being considered again by the coal operators about Terre Haute. Reports of such a movement have been current for several months, but it is evident that the effort has been somewhat accelerated recently by the general hard time which the whole state has met.

The plan is said to provide for the consolidation of all the shipping mines in the state, numbering approximately 125, and is considered with the view to reducing the cost of production and thereby arming the industry in the state with more power and ability to meet competition, which it seems it is utterly unable to do at the present time.

"I have no definite knowledge regarding such a movement," said Phil. H. Penna, secretary of the Indiana Bituminous Coal Operators Association, "but I do know in a general way that the consolidation of the mines of the Indiana field, or perhaps the forming of several consolidations, is being considered by some of the operators. The plan is very desirable, and must be effected if we expect to remain in business."

At present the Indiana mines are producing only about 35 per cent of their potential capacity. Every oper-

### Lewis' Strength Slipping In West Kentucky

It is reported from Central City, Ky., that the Oakland Coal Mining Co., which had been operating in a limited way for a week or so on the 1917 wage scale, succeeded last week in getting its workers to sign up on a local union basis, the men breaking away from the United Mine Workers, as was the case in Webster, Hopkins, Union and Henderson counties. In the Muhlenburg County field, around Central City, the Oakland is the first mine to operate since April 15. The Gibraltar Coal Mining Co. has been cleaning up and getting ready to operate and others probably will start soon, which makes it appear as if the régime of the United Mine Workers in western Kentucky is nearing an end.

It is reported that more than one hundred men started work for the Oakland company last week.

ator is continuing with the hope that conditions will improve. Under a statewide consolidation a great many mines not being operated at present and which are a burdensome expense would be abandoned or indefinitely closed, and only those mines which are necessary to supply the demand would be operated. Co-operative buying and selling would be counted on to reduce expense.

Two similar movements toward consolidation have been talked of in the Illinois mining districts, according to reports received in Terre Haute. Thirty-five mines in the Belleville district are said to be involved in one negotiation and the other scheme includes a number of operations in central Illinois.

### Orders Pittston Strikers to Work or Lose Charters

Scranton, Pa., Dec. 2.—D. W. Davis, international organizer of the United Mine Workers, yesterday called a meeting of District 1 executive board, at which it was decided to give the 12,000 miners of the Pennsylvania Coal Co. engaged in an outlaw strike until Wednesday to return to work before revoking the local union charters.

John L. Lewis, international president of the mine workers, evidently has become weary of complaints from anthracite operators that the contract between the operators and the union is being continuously broken by unauthorized strikes over alleged grievances. He evidently suspects what is taken for a general fact in the anthracite region, that the strikes are just as much a piece of union politics against the presiding district officials as a protest on conditions at the mines. Lewis' attitude was expressed late last week in a telegram ordering the district officials to turn over their problems to Mr. Davis, an Illinois man.

What attitude the Pennsylvania Coal Co. strikers will assume in face of the threat issued by the district board remains to be seen, but it is not expected to bring the strike to an end.



## Program to Eliminate Waste of Wood May Presage Better Mining Methods

Coal Industry Encourages Plan to Conserve Forest Products—Decline  
in Use of Wood for Fuel Promises New Outlet for Coal—  
Economies in Improved Machinery

By PAUL WOOTON

Washington Correspondent of *Coal Age*

The Washington conference on utilization of forest products emphasized the fact that the coal industry has a selfish as well as an altruistic reason for encouraging the research program which aims to eliminate waste of wood. This includes, of course, the utilization of waste for higher purposes when that is possible. The time practically is past when any large portion of so-called forest waste is burned simply to get rid of it. Large amounts of it, however, are being used as fuel.

Higher uses, it was contended at the conference, can be found even for sawdust. Wood fiber lends itself admirably to the making of paper. It was revealed at the conference that a means has been perfected whereby the less valuable American hardwoods can be converted into newsprint paper, a product for which our requirements are large and which now is largely imported. The manufacture of kraft paper from Southern pine of itself in recent years has become a great industry. With the use of paper packing boxes becoming general a great market is being established for container board. The insulating properties of dead air cells have even built up a market for "synthetic" lumber, which consists of boards rolled from a pulp made from timber waste.

The advance already made along these lines, with the comprehensive research program now planned, promises to reduce still further the amount of wood available for the production of energy and heat. Many overlook the extent to which wood is a competitor of coal. In 1922, according to Forest Service figures, 100,000,000 cords of wood were used by the United States. This is equivalent to 60,000,000 tons of coal.

### Much Wood Still Used as Fuel

Sight frequently is lost of the fact that wood was the principal fuel in the United States until 1880. In that year 140,000,000 cords were used, or the equivalent of 90,000,000 tons coal. In the forty-five years since that time it has held on tenaciously and, as stated, still is displacing coal to the extent of some 60,000,000 tons. For the reasons mentioned, however, a much more rapid decline in its use may be expected in the future with something of a windfall to the coal industry, which eventually will absorb most of the 60,000,000 tons—an item of new business which will not be sneezed at.

In the whole forest products conference there was much of interest to coal, in that the steps now being taken to conserve wood eventually will be taken to conserve coal. In its development coal is a generation or more behind the lumber industry. A genera-

tion or two ago forests were so extensive that waste came in for little consideration. It was induced on every hand by cutthroat competition. Some of the very men who had no patience with the Roosevelt-Pinchot plea for conservation, voiced in 1907, were leaders in this recent forest products meeting and are strongly behind the conservation of our forest resources from the trees in the woods to the use of the board by the carpenter who nails it in its final place. They even went further and are urging that the board be protected from decay after it has been placed in final use.

Coal operators in their present state of mind have no great interest in preventing wastes in mining or other avoidable losses, particularly if it adds anything to the cost of production, but if forest products furnish a proper criterion the day is not distant when more is going to be heard of the elimination of waste in coal.

### Economies of Machinery

A union in the height of its power might block a move to utilize roof coal in the Pittsburgh bed, but it might be more conciliatory today when the Pittsburgh operators are so hard pressed in the competitive struggle. The common defense of waste in mining is that the competitive situation is such that full utilization of mine resources is not practicable. It is certain that definite limits exist as to the amount of coal which can be mined, but by using the latest mechanical appliances, under close supervision, it is known that much less coal can be left unmined than usually is the case. Not only that; it has been demonstrated that such a course results in economies which before had not been considered.

Employment of mechanical equipment in the larger scale operations cuts down the time required to work out a given area and reduces the fracture caused by subsidence. The coal industry has not reached the point where it is catching at every straw that suggests an opportunity to lessen waste, but if experience in the lumber industry is duplicated each passing year will see more and more pressure brought to save the maximum amount of a great resource.

### Systematic Research Advisable

In fact the coal industry might be forewarned by the experience in some other industries and undertake more systematic research before such a program is forced upon it. The nitrate producers of Chile, for instance, have gone along blithely for many years mining their product in an antiquated manner and with little regard for the economies of better practice. The synthetic nitrogen industry began to

## Ford Moves Coal Records By Wagon Train

Although Henry Ford, the flivver king, has built millions of automobiles and has money enough to command any known means of transportation, when he found it necessary to move the records of the Fordson Coal Co. from the Redbird operation at Pineville, Ky., to the little community of Annalee, in the heart of the Cumberland Mountains, he had recourse to a wagon train to negotiate the twenty miles.

Whether the transfer meant the early opening of Ford holdings in the mountains could not be verified by officials, who said the move had no special significance.

The equipment will be taken to Garrard Station by train and then loaded on a wagon for the twenty-mile trip over the trail to Annalee.

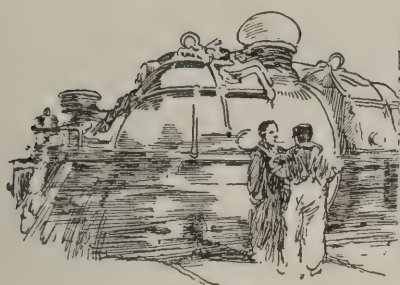
There has been much talk of a railroad to be built by the Ford interests into the heart of the mountain properties, but these reports have always been denied by those in authority.

develop. It had a small beginning and its growth has been at isolated plants scattered throughout the world. The Chilean producers gave little heed, as they felt certain no manufactured product could compete with a great natural resource. Within a year, however, they have been confronted with an aggregate production from many small plants which has cut heavily into their market. At a meeting of these producers in Chile recently the situation was appraised in its significance and a pretentious research program authorized. This is only one example of a general trend. Even industries that are not hard pressed are finding that investments in research pay big dividends.

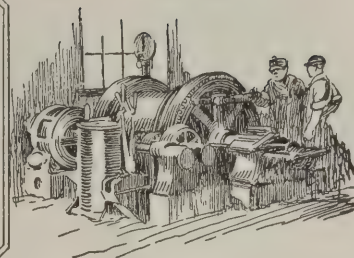
## Nova Scotia Miners Prepare To Demand Higher Wages

Wage demands to be made by the executive officers of District 26, United Mine Workers (Nova Scotia), in negotiating with operators for a new agreement were decided upon at the miners' convention at Sydney, N. S., on Nov. 21. They will ask 25 per cent increase for datal men, 10 per cent increase for contract workers; 10 per cent additional increase for all miners working on night shift or two-shifted places, and a 15 per cent increase for all three-shifted places. The opinion expressed during the discussion was that companies should do away with the double and triple shifts and that the only way to effect this was to force up operating costs by demanding high wages for the men employed in these places. The convention adopted a resolution to the effect that the Executive Board use its influence with the British Empire Steel Corporation and the Department of Mines to have all mines now working continue to operate, failing which "direct action" will be taken by the district.





## Practical Pointers For Electrical And Mechanical Men



### Explosion Cannot Injure This Mine Fan

Weak Section Built in Air Duct Acts as Safety Valve  
—Auxiliary Doors Cover Blown Out Section in Air-  
Way and Ventilation System Is Quickly Restored

Records compiled by the U. S. Bureau of Mines show conclusively that in the event of an explosion or mine fire, if the fans can again be quickly put in service, damage to the mine and injury to the workmen may be greatly reduced.

At the J. K. Dering Coal Co. mine near Eldorado, Ill., an old hoisting shaft is now used as an airway. The fan house is built adjacent to the old shaft, and a concrete duct connects the fan to the shaft. An interesting feature about this airway is that part of it is constructed of light wood boards which have been covered with a thin layer of cement to make them airtight. Should an explosion occur, this section is expected to act as a safety valve. The force of the explosion will probably blow out the boards and thus relieve the fan from the full force of the blast.

In such an event, if it is desirable, as it usually is, to get the fan in operation, the auxiliary sheet-iron doors hinged to the edge of the weak section in the airway, which have hitherto been left open, may be closed, repairing the breach that the explosion has caused. The facility with which this operation can be performed makes this provision of unusual value. The illustration shows a diagrammatic sketch of the airway, fan and airshaft. Fig. 1 shows the doors raised for the purpose of ex-

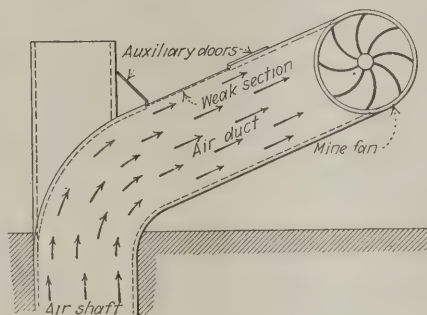


Fig. 2—Mine Fan with Relief Section

An explosion in the mine ventilated by this fan would no doubt blow out the weak section of the air duct, which has been arranged to relieve the fan of the full force of the explosion.

hibiting their location on the fan duct. It is possible to close both of these doors just as soon as any part or the whole of the weak portion of the airway is blown out.

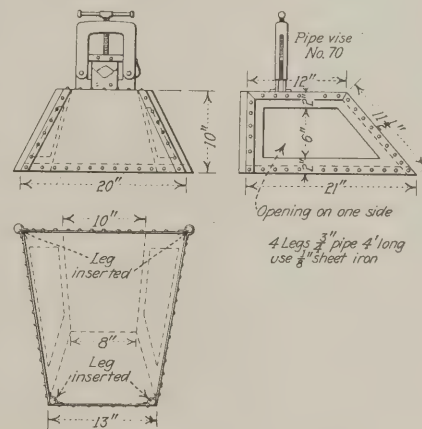
### Portable Pipe Vise, Another Time Saver

Running conduit in a breaker may be made a hard job or an easy one according to the way in which it is handled. At Hazleton Shaft Colliery, of the Lehigh Valley Coal Co., new

construction made necessary the tearing out of some of the old lighting lines faster than replacements could be made. The need for lights made it essential that the work be speeded up, and the question was raised as to the cause for the slow progress.

An investigation located the trouble easily. The method previously used was to strap a pipe vise on whatever beam was handiest. As the conduit line advanced, the vise had to be moved to another beam and fastened to it. This consumed much time, because, if there was no beam handy, the vise had to be taken back to the old set-up which in some cases was some distance away. More than once the vise disappeared over night or over the week end, because being so readily portable someone had borrowed it and then had failed to put it back in its place.

In order to avoid these difficulties, a sheet-metal body was constructed ar-



### Portable Pipe Vise Easily Made

All the necessary fittings for a conduit construction job are carried with this one-man vise and stand.

ranged for the reception of four pipe legs. The pipe vise was permanently mounted on the top of this body, forming a portable, one-man equipment, complete and ready to be set up anywhere desired. Underneath the vise is a pocket which holds a collection of conduit fittings, a can of white lead, pipe straps, nails, etc., necessary in making a conduit installation. When the vise is moved, the small tools and parts are carried with it.

The sketch gives a fair idea of how this handy tool was constructed, and anyone who can make use of the contrivance is welcome to build one like it.

Hazleton, Pa. JOHN FRANCIS,  
Electrician.  
Employees' Magazine Lehigh Valley Coal Co.

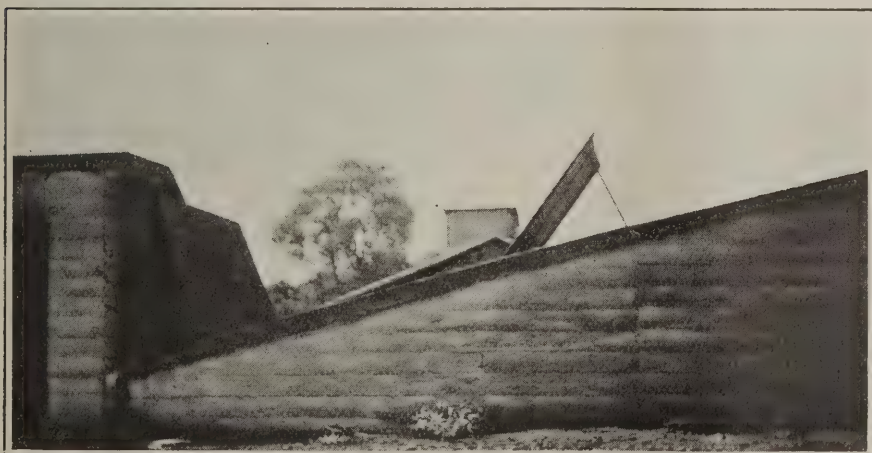


Fig. 1—Sheet-Iron Fan Doors Ready to Be Closed

By closing the sheet-iron doors the damaged part of the airway may be quickly sealed off and the fan started after an explosion. Even greater protection would have been afforded had a somewhat larger weak section been placed in the direct line of the shaft. Probably some reason not apparent prevented a choice of this position.



## Put Sand in the Boxes and Not in the Bearings

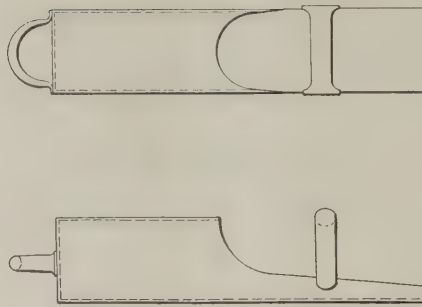
Sand, dust and dirt cause more damage to bearings in a few minutes than months of ordinary wear. Mine locomotives are built close to the ground, and consequently axle bearings and motors soon become covered with dirt and fine road dust.

Even though it is necessary to sand mine rails, the practice has its disadvantages. The sand is easily picked up by the motor wheels and dropped on the bearings. However, this cannot be avoided, but with care the sand that usually enters the bearings when the sand boxes are being filled can be prevented from so doing.

At some mines an extra supply of sand is carried on the locomotive so that if the sand boxes are emptied they can be promptly filled even though the locomotive may be a long distance from the sand bin.

### STOP LEAKAGE OF SAND

Sand which is carried on the top of a locomotive sooner or later leaks and gets into the bearings. Therefore, this practice should be discouraged.



**Handy Scoop Prevents Sand from Spilling on Bearings**

It is easy to shoot sand into locomotive sand boxes when this device is used. Sand that gets into the bearings grinds them out and increases maintenance costs.

On some locomotives the holes for the sand boxes are so located that it is difficult to fill them without spilling sand on the ground or on parts of the locomotive. The sketch shows a handy scoop with two handles. This accessory makes it easy to dig into the sand pile and facilitates filling the boxes. It is both a bucket and a chute, and when used prevents sand from getting in the axle bearings.

## Battery-Locomotive Meter Put in Negative Line

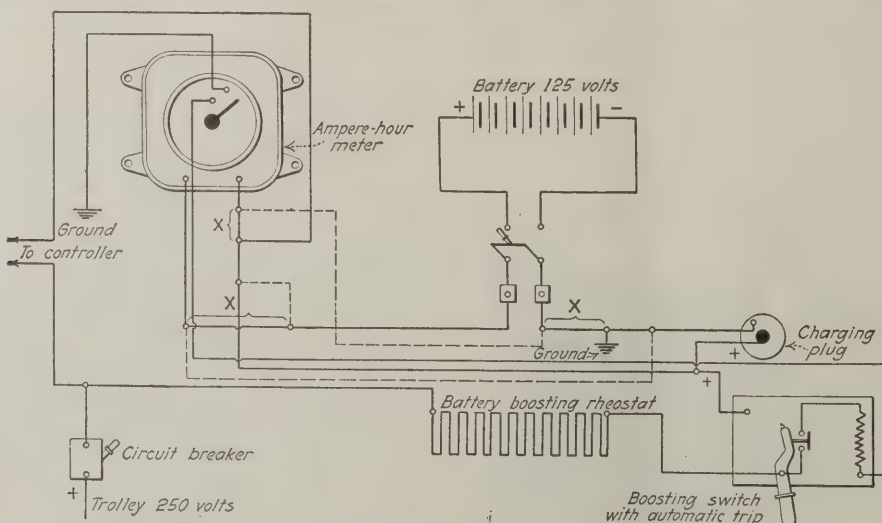
Trouble with ampere-hour meters on our combination battery-and-trolley locomotives has been greatly reduced by a simple change in the wiring. These locomotives are equipped with 180-volt motors which are supplied with 250 volts when operating from the trolley and with 125 volts when operating from the battery. The change from one voltage to the other is made by connections on the reverse cylinder of the controller. The fact that these are combination locomotives makes it necessary to have the negative wiring grounded to the frame as with the ordinary trolley-type locomotive.

As originally received these locomotives had the meter connected in the positive side of the battery circuit.

This arrangement, together with the permanent ground of the negative to the frame, caused a difference of potential between the wiring in the meter and the meter case of 100 to 150 volts. It frequently happened that the meters were severely damaged by arcs to the ground, the arcs generally being caused by the meter cover while being removed coming in contact with the meter windings. Changing the wiring so as to place the meter in the negative line, has entirely eliminated this trouble.

### CHANGED ORIGINAL CONNECTIONS

The original wiring is indicated by the full lines in the accompanying drawing. The scheme of the revised wiring, placing the meter in the negative, is indicated by the additional dotted lines and by the marks X which denote that certain wires were cut.



### Meter Shifted to Negative Line Prevents Damage

To make this change required cutting the old wiring in three places, shown at X, and making additional connections illustrated by the dotted lines. Now the difference of potential between the meter circuits and the meter case is so low that insulation breakdowns and short circuits are almost impossible.

Before the change an average of six meters per year, from the five combination locomotives in use, were damaged by grounds. The position of the meters was changed to the negative conductor over two years ago and since that time not one of the meters has been damaged by grounding or internal arcing.

R. R. WEBSTER,  
Master Mechanic.

Elkhorn Piney Coal Mining Co.,  
Weeksbury, Ky.

## How to Weld Cast Iron with A Self-Fluxing Electrode

An electrode has been devised by the General Electric Co., and will be described in the New Equipment section soon, which consists of a metal core surrounded by a suitable coating of flux, the whole being provided with a sheath so that the operative has in the metallic rod all the material for the making of the weld except the torch and tanks. The method of using such electrodes is as follows:

(1) The electrode should be held at right angles to the work, maintaining a short arc, except when it is difficult to fuse the metal properly, which is due to what is commonly called a hard or sandy condition in the base stock. When this occurs the arc should be lengthened temporarily to afford the desired fusion.

(2) The arc should travel in a direct line along the seam when welding thin parts, and be moved back and forth across the joint on heavier parts. The arc should never be vibrated or weaved to and fro as is the practice when using ordinary base electrodes.

(3) The fact that the welding electrode fuses more rapidly than other electrodes should not encourage rapid travel. Slow travel tends to avoid rapid cooling and thus produces softer and sounder welds. The flux coating deposited by the electrode also materially assists in retarding the rates of cooling.

(4) Where practicable, the weld should be completely filled in one continuous deposit rather than in successive layers. In welding heavy V'd parts, the V should be completely filled from bottom to top during the advance along the line of the weld.

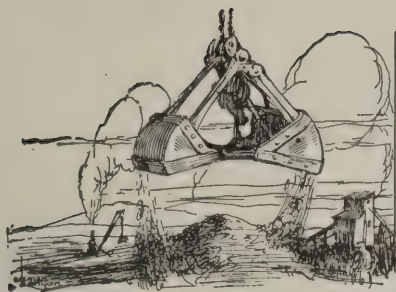
(5) To insure against slag inclusions, any accumulations of flux scale may be occasionally removed, although thin layers of this scale are easily fused and float to the top with the slow travel of the arc.

### Current Values for Various Sizes of Electrode

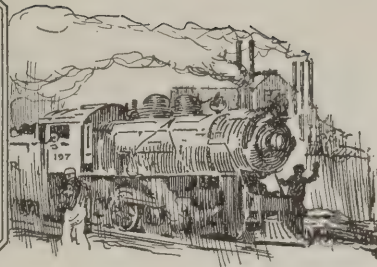
Diameter Electrode in In.	Current in Amp.	Diameter Electrode in In.	Current in Amp.
$\frac{3}{8}$	50	$\frac{3}{8}$	140
$\frac{1}{2}$	Up to 110	$\frac{1}{2}$	180

Suitable current values for the various sizes of electrode are given in the accompanying table. For some purposes current values greater than those herein mentioned may be used to advantage.





# Production And the Market



## Spottiness Characterizes Soft-Coal Market; Anthracite Business Easier

Spottiness continues to characterize the coal business of the country. A taste of winter weather in the Middle West has given stimulus to domestic demand, but the supply is more than sufficient to meet all requirements. In Kentucky and Ohio, however, a return of mild temperature has brought about a weakening tendency, which has been intensified by the virtual close of lake shipping. There is a slight improvement in West Virginia for both steam and domestic grades. The Pittsburgh market has sagged again after several weeks of gradual upturn. The Atlantic seaboard as well as the Southwestern markets are holding to a fairly even keel, marked neither by high lights nor dark shadows. New England is in the throes of a dull period from which there is no immediate prospect of relief.

In most sections steam coal is moving largely on contract, and consumers are taking comparatively small quantities. Those not parties to agreements are jogging along on the old hand-to-mouth scheme, reassured by the weather, the volume of output and continued good performance by the railroads. Despite the heavy grain movement there has been practically no car shortage, but some easy-going consumers may have overlooked the developments that probably would follow in the wake of a snowstorm or a real cold wave.

### Anthracite Business Featureless

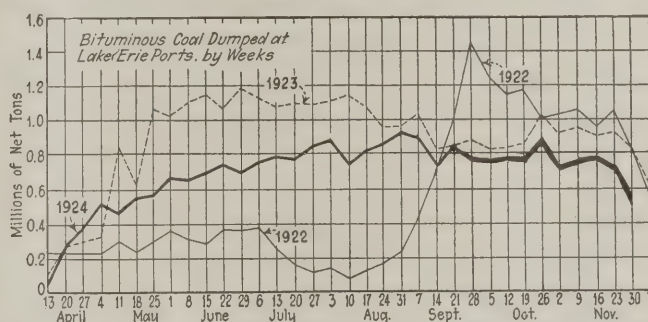
A somewhat complacent attitude marks the anthracite trade, consumers being disposed to take things easy. Shipments have been irregular because of intermittent outlaw strikes at the mines, but independent quotations have not been much affected. In general the call for stove has been in excess of the supply, though Philadelphia shows a preference for nut. Egg moves only moderately well, but pea is sluggish. Steam coal shows medium activity, buckwheat being somewhat improved and rice and barley a little easier.

Coal Age Index of spot prices of bituminous coal

advanced one point last week, standing on Dec. 1 at 171, the corresponding price for which is \$2.07.

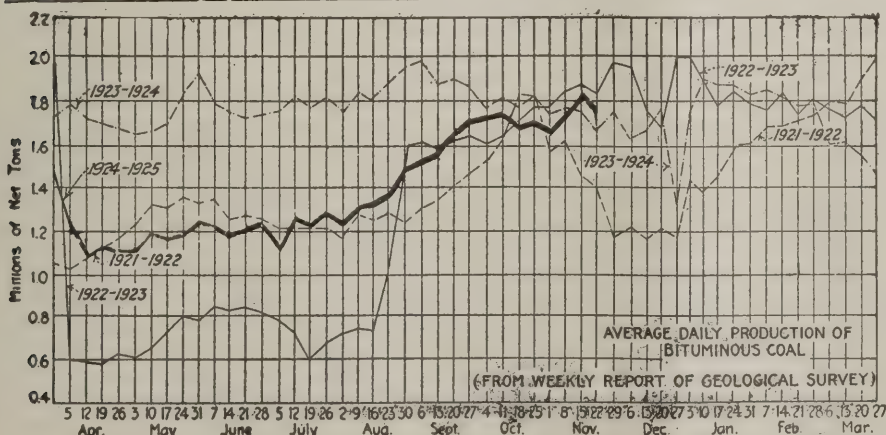
A pronounced slump marked activity at Hampton Roads last week, dumpings of coal for all accounts for the seven-day period ended Nov. 27 totaling 299,555 net tons, compared with 369,793 tons the week before.

The lake navigation season practically came to an end last week, when dumpings at Lake Erie ports up to and including Nov. 30, according to the Ore & Coal Ex-



change, were as follows: For cargo, 562,467 net tons; for fuel, 20,802 tons, compared with 704,930 and 28,698 tons respectively during the preceding week.

There is not much change in the daily rate of production of bituminous coal, for although the total output for the week ending Nov. 22, according to the Geological Survey, was 10,588,000 net tons, an increase of 459,000 tons over the preceding week, the lower figure for that week was due to the partial observance of Armistice Day. It is interesting to note, however, that this is the second time that output has exceeded that of the corresponding week of 1923. Anthracite production in the week ended Nov. 22 totaled 1,827,000 net tons, compared with 1,674,000 tons in the previous week and 2,031,000 tons in the corresponding week of last year. Local strikes have been limiting hard-coal output.



### Estimates of Production

(Net Tons)

#### BITUMINOUS

	1923	1924
Nov. 8.....	10,726,000	9,331,000
Nov. 15 (a).....	9,717,000	10,129,000
Nov. 22 (b).....	10,160,000	10,588,000
Daily average.....	1,693,000	1,765,000
Cal. yr. to date (c).....	495,428,000	413,574,000
Daily av. to date.....	1,795,000	1,498,000

#### ANTHRACITE

Nov. 8.....	1,903,000	1,592,000
Nov. 15.....	1,669,000	1,674,000
Nov. 22.....	2,031,000	1,827,000
Cal. yr. to date (c).....	84,424,000	81,227,000

#### COKE

Nov. 15 (a).....	254,000	149,000
Nov. 22 (b).....	257,000	158,000
Cal. yr. to date (c).....	16,640,000	8,608,000

(a) Revised since last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.



### Midwest Is Colder Now

Some improvement in a sagging domestic market was felt throughout the Midwest during the week because of the snappy weather. There were no price changes worthy of note, however, except in Standard screenings because the supply always is so ready to meet and overwhelm the demand. This situation explains why not all the lump and egg coal standing unbilled on wheels in Illinois and Indiana has been shipped. Steam business throughout those two states is only fair. Too many mines have reopened lately for the good of the market.

Railroad business from Illinois mines is easy, a few roads taking a little coal. Strip mines continue to show good production and are selling at what the market will bring and usually are in competition with the low prices of the non-union west Kentucky field. Cars are plentiful and mines are getting from two to four days a week.

Mt. Olive is still slow in domestic and mines are getting but two and three days a week; those working three are loading railroad coal. Steam is going mostly on contract. In the Standard field there has been an advance in the price of screenings, which is now \$1@1.15. Everything else from that field is dragging.

Seasonable weather in St. Louis has created a little domestic demand for middle grade coal. The weather as yet has not brought the demand for Standard that it will later.

There is practically no anthracite, smokeless or coke moving, and this is discouraging. The only answer is that people who usually buy this kind of coal have not bought it thus far and will not because they have oil burners. Local wagonload steam is fairly good and carload is slow. Country demand for steam is nil and country domestic is good in spots only.

### Kentucky Business Is Spotty

Further weakness has appeared in the Kentucky market for prepared coal over the week due to lack of ready demand on account of warm weather and slow buying tactics of consumers and retailers. Steam prices remain unchanged, with both eastern and western Kentucky quoting screenings at 85c.@1 and mine run \$1.50@1.75, some houses asking as high as \$1.85 for mine run. In western Kentucky lump sizes are weaker, block being offered at \$2.75@3; lump, \$2.40@2.75; egg, \$2.25@2.75; nut, \$1.60@2.10. In eastern Kentucky 4-in. block is \$2.75@3.25; lump, \$2.25@2.75; egg, \$1.90@2.25; nut, \$1.60@1.90.

General conditions are good and Kentucky has been getting a good volume of business considering other fields and weather conditions. It also is believed that over winter volume will be greater than in past seasons, due to the fields being favored by low production cost on the non-union basis and ability to absorb freight rates, etc., and get into territory usually served by union mines to the north.

### Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern		Market Quoted	Dec. 3 1923	Nov. 17 1924	Nov. 24 1924	Dec. 1 1924†	Midwest		Market Quoted	Dec. 3 1923	Nov. 17 1924	Nov. 24 1924	Dec. 1 1924†
Smokeless lump.....	Columbus....		\$4.10	\$4.10	\$4.25	\$4.00@4.25	Franklin, Ill. lump.....	Chicago.....	\$4.10	\$3.35	\$3.35	\$3.25@3.50	
Smokeless mine run.....	Columbus....		2.10	2.00	2.00	1.75@2.25	Franklin, Ill. mine run.....	Chicago.....	2.35	2.35	2.35	2.25@2.50	
Smokeless screenings.....	Columbus....		1.30	1.25	1.25	1.20@1.35	Franklin, Ill. screenings.....	Chicago.....	1.55	1.35	1.45	1.35@1.60	
Smokeless lump.....	Chicago.....		4.10	4.10	3.85	3.75@4.00	Central, Ill. lump.....	Chicago.....	3.10	2.85	2.85	2.75@3.00	
Smokeless mine run.....	Chicago.....		2.00	1.85	1.85	1.75@2.00	Central, Ill. mine run.....	Chicago.....	2.10	2.20	2.20	2.15@2.25	
Smokeless lump.....	Cincinnati.....		3.10	3.75	4.00	3.75@4.25	Central, Ill. screenings.....	Chicago.....	1.35	1.25	1.30	1.25@1.30	
Smokeless mine run.....	Cincinnati.....		2.00	1.85	1.85	1.75@2.00	Ind. 4th Vein lump.....	Chicago.....	3.35	3.10	3.10	3.00@3.25	
Smokeless screenings.....	Cincinnati.....		1.35	1.15	.95	.75@1.15	Ind. 4th Vein mine run.....	Chicago.....	2.60	2.35	2.35	2.25@2.50	
*Smokeless mine run.....	Boston.....		4.60	4.30	4.25	4.20@4.35	Ind. 4th Vein screenings.....	Chicago.....	1.55	1.45	1.55	1.50@1.60	
Clearfield mine run.....	Boston.....		1.85	1.90	1.95	1.70@2.25	Ind. 5th Vein lump.....	Chicago.....	2.50	2.85	2.75	2.50@3.00	
Camelia mine run.....	Boston.....		2.50	2.30	2.30	2.00@2.60	Ind. 5th Vein mine run.....	Chicago.....	2.10	2.10	2.10	2.00@2.25	
Somerset mine run.....	Boston.....		2.10	2.05	2.05	1.80@2.35	Ind. 5th Vein screenings.....	Chicago.....	1.30	1.10	1.20	1.10@1.35	
Pool 1 (Navy Standard).....	New York.....		3.00	2.75	2.80	2.65@3.00	Mt. Olive lump.....	St. Louis.....	3.10	3.00	3.00	3.00	
Pool 1 (Navy Standard).....	Philadelphia.....		3.00	2.70	2.70	2.50@2.90	Mt. Olive mine run.....	St. Louis.....	2.25	2.35	2.35	2.25@2.50	
Pool 1 (Navy Standard).....	Baltimore.....		3.00	2.30	2.30	2.10@2.50	Mt. Olive screenings.....	St. Louis.....	1.25	1.10	1.10	1.00@1.25	
Pool 9 (Super. Low Vol.).....	New York.....		2.35	2.10	2.10	2.00@2.25	Standard lump.....	St. Louis.....	3.05	2.75	2.75	2.75	
Pool 9 (Super. Low Vol.).....	Philadelphia.....		2.30	2.15	2.15	1.95@2.35	Standard mine run.....	St. Louis.....	2.05	1.95	1.95	1.90@2.00	
Pool 9 (Super. Low Vol.).....	Baltimore.....		2.05	1.70	1.70	1.65@1.80	Standard screenings.....	St. Louis.....	.55	.65	.65	1.00@1.15	
Pool 10 (H.Gr.Low Vol.).....	New York.....		2.00	1.85	1.85	1.65@2.00	West Ky. lump.....	Louisville.....	3.00	3.05	3.00	2.75@3.00	
Pool 10 (H.Gr.Low Vol.).....	Philadelphia.....		1.85	1.75	1.75	1.65@1.90	West Ky. mine run.....	Louisville.....	1.70	1.60	1.60	1.50@1.75	
Pool 10 (H.Gr.Low Vol.).....	Baltimore.....		1.90	1.55	1.55	1.50@1.65	West Ky. screenings.....	Louisville.....	.70	.80	.90	.85@1.00	
Pool 11 (Low Vol.).....	New York.....		1.65	1.60	1.60	1.50@1.75	West Ky. lump.....	Chicago.....	2.85	2.75	2.75	2.50@3.00	
Pool 11 (Low Vol.).....	Philadelphia.....		1.70	1.45	1.45	1.35@1.60	West Ky. mine run.....	Chicago.....	1.75	1.55	1.55	1.40@1.70	
Pool 11 (Low Vol.).....	Baltimore.....		1.75	1.45	1.45	1.40@1.50							
High-Volatile, Eastern							South and Southwest						
Pool 54-64 (Gas and St.)..	New York...		1.60	1.50	1.50	1.40@1.65	Big Seam lump.....	Birmingham..	3.85	3.10	3.10	2.75@3.50	
Pool 54-64 (Gas and St.)..	Philadelphia..		1.65	1.50	1.50	1.40@1.60	Big Seam mine run.....	Birmingham..	1.95	1.70	1.70	1.50@1.90	
Pool 54-64 (Gas and St.)..	Baltimore.....		1.70	1.45	1.45	1.40@1.50	Big Seam (washed)....	Birmingham..	2.35	1.85	1.85	1.75@2.00	
Pittsburgh sc'd gas.....	Pittsburgh....		2.55	2.40	2.40	2.30@2.50	S. E. Ky. lump.....	Chicago.....	3.10	2.75	2.75	2.50@3.00	
Pittsburgh gas mine run..	Pittsburgh....		2.25	2.10	2.10	2.00@2.25	S. E. Ky. mine run.....	Chicago.....	1.85	1.60	1.60	1.50@1.75	
Pittsburgh mine run (St.)..	Pittsburgh....		2.00	1.85	1.85	1.75@2.00	S. E. Ky. lump.....	Louisville....	3.35	3.25	3.00	2.75@3.25	
Pittsburgh slack (Gas)....	Pittsburgh....		1.30	1.15	1.15	1.15@1.25	S. E. Ky. mine run.....	Louisville....	1.75	1.60	1.60	1.50@1.75	
Kanawha lump.....	Columbus.....		3.00	2.55	2.55	2.10@2.60	S. E. Ky. screenings....	Louisville....	.80	.95	.90	.85@1.00	
Kanawha mine run.....	Columbus.....		1.85	1.55	1.55	1.45@1.65	S. E. Ky. lump.....	Cincinnati..	3.00	2.75	2.75	2.50@3.00	
Kanawha screenings.....	Columbus.....		.80	.95	.90	.80@1.00	S. E. Ky. mine run.....	Cincinnati..	1.50	1.45	1.45	1.35@1.65	
W. Va. lump.....	Cincinnati..		2.75	2.65	2.55	2.75@3.00	S. E. Ky. screenings....	Cincinnati..	.65	.95	.95	.85@1.20	
W. Va. gas mine run.....	Cincinnati..		1.50	1.45	1.40	1.30@1.60	Kansas lump.....	Kansas City..	5.10	5.00	5.00	4.50@5.00	
W. Va. steam mine run....	Cincinnati..		1.50	1.35	1.40	1.30@1.60	Kansas mine run.....	Kansas City..	3.25	3.35	3.35	3.25@3.50	
W. Va. screenings.....	Cincinnati..		.50	.95	1.00	.80@1.20	Kansas screenings....	Kansas City..	2.00	2.00	2.30	2.25@2.35	
Hocking lump.....	Columbus....		2.95	2.55	2.55	2.35@2.75							
Hocking mine run.....	Columbus....		1.85	1.60	1.60	1.50@1.75							
Hocking screenings.....	Columbus....		.80	.75	.80	.75@.90							
Pitts. No. 8 lump.....	Cleveland....		2.55	2.40	2.30	2.00@2.85							
Pitts. No. 8 mine run.....	Cleveland....		1.90	1.85	1.85	1.85@1.90							
Pitts. No. 8 screenings....	Cleveland....		1.40	1.10	1.20	1.15@1.30							

\* Gross tons, f.o.b. vessel, Hampton Roads.  
† Advances over previous week shown in heavy type, declines in italics.

\* Gross tons, f.o.b. vessel, Hampton Roads.

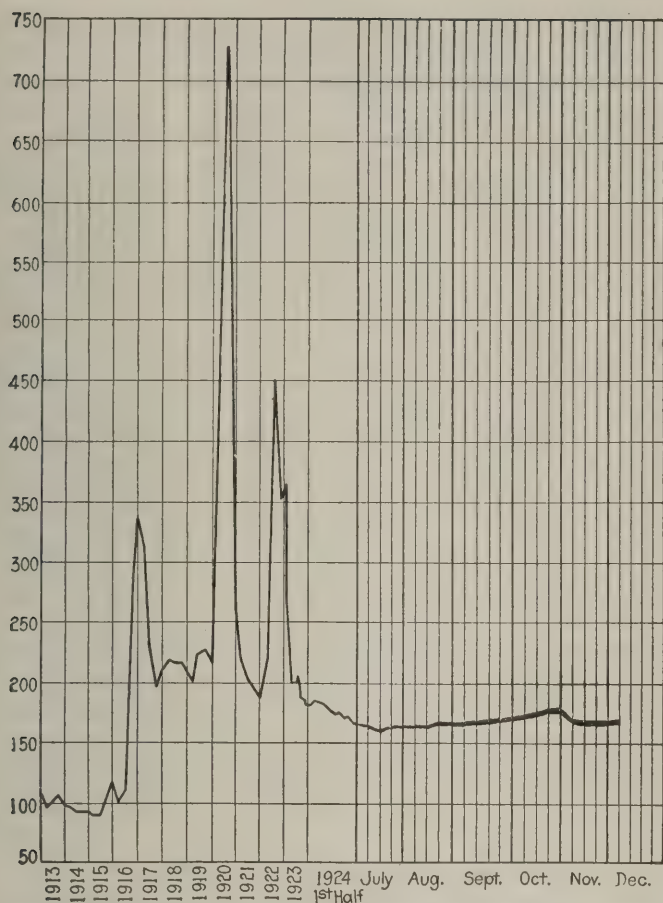
† Advances over previous week shown in heavy type, declines in italics.

### Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

		Market Quoted	Freight Rates	Dec. 3, 1923		Nov. 24, 1924		Dec. 1, 1924†	
				Independent	Company	Independent	Company	Independent	Company
Broken.....	New York.....		\$2.34	\$8.50@10.00	\$8.00@9.25		\$8.00@9.25		\$8.00@9.25
Broken.....	Philadelphia.....		2.39				9.15		9.15
Egg.....	New York.....		2.34	9.85@12.25	8.75@9.25	\$8.75@9.00	8.75@9.25	\$8.50@9.00	8.75@9.25
Egg.....	Philadelphia.....		2.39	9.85@12.20	8.75@9.25	9.45@9.75	8.80@9.25	9.45@9.75	8.80@9.25
Egg.....	Chicago.....		5.06	9.60@12.50	8.00@8.35	8.17@8.25	8.14@8.20	8.17@8.25	8.14@8.20
Stove.....	New York.....		2.34	9.85@12.25	8.75@9.25	10.00@10.50	8.75@9.50	10.00@10.50	8.75@9.50
Stove.....	Philadelphia.....		2.39	9.85@12.20	8.90@9.25	10.10@10.75	9.15@9.50	10.10@10.75	9.15@9.50
Stove.....	Chicago.....		5.06	9.60@12.50	8.00@8.35	8.63@8.75	8.50@8.64	8.63@8.75	8.50@8.64
Chestnut.....	New York.....		2.34	9.85@12.25	8.75@9.25	9.75@10.50	8.75@9.25	10.00@10.50	8.75@9.25
Chestnut.....	Philadelphia.....		2.39	9.85@12.20	8.90@9.25	9.85@10.50	9.15@9.25	9.85@10.50	9.25@9.40
Chestnut.....	Chicago.....		5.06	9.60@12.50	8.00@8.35	8.26@8.40	8.44@8.60	8.26@8.40	8.44@8.60
Pea.....	New York.....		2.22	6.15@7.50	6.15@6.65	5.00@5.50	5.50@6.00	4.75@5.50	5.50@6.00
Pea.....	Philadelphia.....		2.14	6.75@9.00	6.35@6.60	5.75@6.00	6.00	5.75@6.00	6.00
Pea.....	Chicago.....		4.79	6.00@6.75	5.40@6.05	5.13@5.45	5.36@6.20	5.13@5.45	5.36@6.20
Buckwheat No. 1.....	New York.....		2.22	1.75@3.50	3.50	2.00@2.50	3.00@3.15	2.00@2.75	3.00@3.15
Buckwheat No. 1.....	Philadelphia.....		2.14	2.25@3.50	3.50	2.50@3.00	3.00	2.50@3.00	3.00
Rice.....	New York.....		2.22	1.25@2.50	2.50	1.75@2.15	2.00@2.25	1.75@2.00	2.00@2.25
Rice.....	Philadelphia.....		2.14	1.75@2.50	2.50	2.00@2.25	2.25	2.00@2.25	2.25
Barley.....	New York.....		2.22	1.00@1.50	1.50	1.25@1.50	1.50	1.25@1.50	1.50
Barley.....	Philadelphia.....		2.14	1.00@1.50	1.50	1.50	1.50	1.50	1.50
Birdseye.....	New York.....		2.22		1.60	1.40@1.60	1.60	1.40@1.60	1.60

• Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.





Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

Index	1924			1923
	Dec. 1	Nov. 24	Nov. 17	Dec. 3
Index	171	170	170	181
Weighted average price	\$2.07	\$2.06	\$2.06	\$2.19

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke; 1913-1918," published by the Geological Survey and the War Industries Board.

Industrial and public utility buying has been sufficient to keep the market well cleaned up in so far as screenings are concerned and at relatively good prices.

West Kentucky has been getting a fair but scattered business. The strike is disintegrating but not enough new tonnage has been produced to affect the market much.

### Northwest Is Still Busy

The rush in coal trade continues at Duluth with anthracite the only laggard. This, however, does not worry the trade, as it is considered that all the hard coal now on hand will move of its own accord before spring. Shipments are good to the docks. Last week 37 cargoes arrived, of which 5 were hard coal, and 16 are reported on the way, of which 3 are hard coal.

Despite the attitude on hard coal sagging prices will not be surprising. There are more than 600,000 tons on three docks, and the total on all docks must be staggering. The supply of Pocahontas goes out as fast as it comes in and purchasers are not buying hard coal when they cannot get Pocahontas but are taking other substitutes such as briquets and other brands of semi-smokeless soft coal.

Docks are working more than full time. Orders in bituminous are coming in and there has been no change in the market. The Dakotas and other Western states are buying.

At the Twin Cities seasonable weather for two weeks has put a snap into the market which has been lacking for many months. There is no wild rush of orders, but a good steady demand, which has made the price schedule steady. There has been no serious congestion of stocks, and now that the winter season is at hand, the market starts with a fairly clean slate.

The first effect of cold weather was to start the retail demand in these cities in a way that has not been felt for a long time. Similarly there was a distinct pickup in the movement of domestic coal to the country. While the effect was to brace the market, it did not result in any changes of price, aside from screenings. These had been dragging sadly because of mild weather. Southern Illinois screenings advanced to \$1.40@1.60; lump coal was firm at \$3.25-@3.50; central Illinois lump was \$2.75@3; western Kentucky lump, \$3. Dock prices remained at their list prices.

There has been no change in the coal situation in Milwaukee aside from a decline in the movement of coal up the lakes as the season of navigation nears the close. There are only a few more cargoes on the way. Dealers report the market quiet, as no biting weather has yet been experienced. The total amount of coal received in Milwaukee up to and including Nov. 26 is 767,394 tons of anthracite and 2,450,155 tons of bituminous coal—3,217,549 tons in all. In the same period of 1923 894,624 tons of anthracite and 3,086,622 tons of bituminous coal was received.

### West Keeps Even Keel

Demand for prepared grades of Kansas coal is so light that, while list prices have not been changed, actual sales of Kansas lump are being made for as low as \$4.50 a ton. The list price is \$5. The screenings market, on the other hand is steadily becoming tighter, with few quotations under \$2.25 and many at \$2.35. Shading also is found in nut, although not so pronounced as in lump. Nut, which for several weeks had stood at \$4, is now being sold at \$3.75@4. There have been no changes in prices in other fields of the Southwestern district, although operating time throughout is averaging not more than 50 per cent of normal.

A slight drop in temperature last week stimulated the Colorado domestic market only a little. However, Colorado mines are doing fairly well, having worked on an average of 31 hours last week, and only 17 per cent of the total working time lost was attributed to "no market." Prices remain unchanged since Oct. 20.

As a result of colder weather, Utah mines are increasing output. Production is now 60 per cent of full-time capacity. Lump coal is not moving as well as it was and intermediate sizes are in better demand. Slack is described as easy. The California market is very good, but demand from the Northwest has fallen off again. The Idaho market is quiet, too, but business is better in Nevada. The home market is fair. The smelting industry continues to be the best industrial customer for coal. Sugar manufacturing in the Salt Lake district for this year is practically over. The shorter run is the result of a light beet crop. The labor situation is good and car supply is practically normal again.

### Weakness Pervades Ohio Markets

The last week has been one of general weakness in the Cincinnati market. Domestic buying was off because of mild weather and the presence of big reserves against immediate buying in most of the retail yards. All movement of lake tonnage had been stopped by the close of navigation. Western fuel shipments were stopped by the fact that a lower freight rate is to be put into effect Dec. 5 and buyers were waiting to take advantage of it. Tidewater call was low because the coastwise business was bad. The byproduct market alone showed any buoyancy. It was much better.

Under all the circumstances prices held up amazingly well. This is explained, however, by a very prompt attempt in the Kentucky and West Virginia districts to check surplus production.

Recent rains have raised the water stage of the Ohio River so that half a dozen big companies engaged in river traffic now are bringing 40,000 or 50,000 tons of coal a week from the West Virginia districts, which is about double the tonnage that had been coming down.

Trade in Columbus and central Ohio continues rather quiet and featureless. As the lower temperatures did not last long, buying is still from hand to mouth and neither steam users nor dealers are inclined to stock up to any extent. Prices on domestic business have weakened as some decline in West Virginia quotations has been noted. It is difficult to find an outlet for demurrage coal. Steam contracting is not brisk and most of those with agreements are taking reduced tonnages. Screenings are selling at low figures because of the closing of the lake trade, which has thrown an additional amount on the market.

Screenings are now providing the only activity which is



discernible in the Cleveland market. These grades continue to be scarce and the prices are rising. There is practically no change in other grades; steam demand is quiet, and the retail yards are pretty well stocked for the winter. No changes in prices are noted on other grades. With the lake season over quite a few eastern Ohio mines are likely to close, causing prices on all grades to stiffen.

### Pittsburgh Market Flops Again

Another slump has hit the Pittsburgh market, it being extremely difficult to sell coal on the open market. Some operators are believed to be inducing customers to take coal by making slight price concessions, the actual prices made not being ascertained. Consumers having regular mine connections are taking coal as usual. The railroads are running as heavily as ever and so are the industries. Domestic distribution, however, has been poor. There is no change in quotable prices save for a stiffening in slack.

The Buffalo market is dubious with so little seasonable weather. The trade has about given up all idea of an active business this winter. Canada is still pretty hard to do business with, as industry in general is dull there and does not promise to pick up much right away. With the nearing of the end of the lake season the supply of slack is short and the demand is better.

There is practically no change in the Toronto market, demand continuing to be light. Quotations are as follows: Pennsylvania smokeless, \$5.85; slack, \$5.

### Dullness Lingers in New England

In New England the steam coal market continues dull and with no prospect of change during December. Shipments are being made in fair volume coastwise, but practically all is being applied on contracts. Spot business is very light, and while efforts are being made to encourage buying against the winter months the consumer is still making only sparing purchases.

At Hampton Roads the accumulations are by no means heavy, but the agencies find themselves obliged to watch the trade closely in order to move current output. Recent sales of Pocahontas and New River of Navy acceptable grade have averaged \$4.20@ \$4.35, with less desirable coals selling off to \$4.

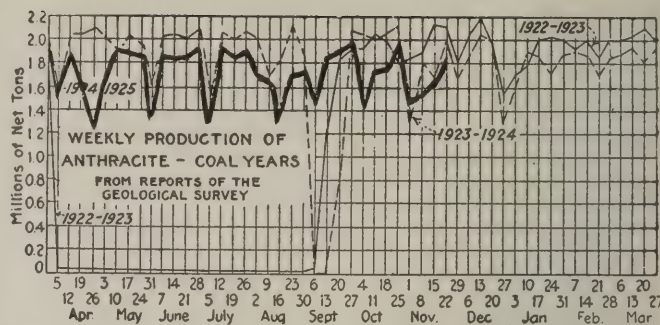
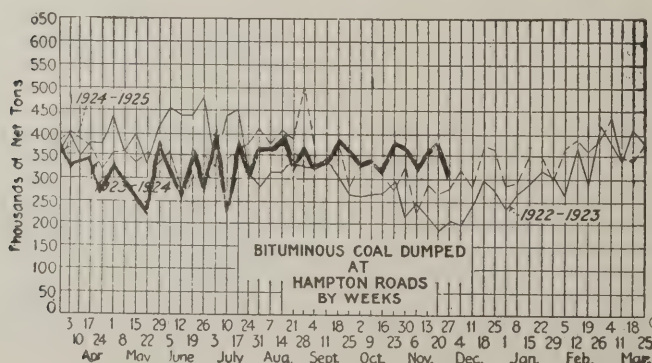
For delivery inland from Boston, Providence and Portland high grade smokeless coals are in ample supply, with only moderate inquiry. At Boston \$5.35 per gross ton is the utmost that these grades command on cars for mine run. Slack is being offered much lower than the usual differential at the mines would indicate.

All-rail from central Pennsylvania there is only a fair tonnage moving into this territory. The selling radius of Southern coals is now wide enough from rehandling wharves here to restrict the opening for rail coal much more than was the case early in the season.

### Atlantic Markets Develop Softness

A softer market for spot coal prevailed at New York last week and it is expected that buying now will be subject to weather conditions. Most consumers have bought quietly and at present are well stocked up. Demand for some grades of West Virginia coal has eased off to such an extent that mining has been curtailed somewhat. So much coal is coming to the New York tidewater piers that it is moved only by intensive sales effort.

At Philadelphia the cold spell quickly spent itself and had little effect on the coal trade. Many large users still purchase a fair amount of spot coal but the amount they buy



under contract has increased recently. Demand is centered on high class coals, which tends to keep the low grade fuels pretty well off the market. Not much coal is standing at tide, as the loadings are very light, with bunkering slow.

Demand at Baltimore is about what it has been for several weeks past, and shipments have more than kept pace with the call for coals for immediate use and storage against the near future. Prices are constant and there has been little change for several weeks past. November exports of coal at Baltimore have continued to lag behind those of October, only two shipments having been made between the 10th and 28th.

Some fairly seasonable weather at Birmingham brought temporary activity in the retail domestic movement, but as yet the mines are booking only scattering orders for small lots. Some mines are well fixed on domestic business under contracts and are booking enough spot orders to move the output, but as a whole the market is sluggish. Buying of steam coal has not materially improved. Bunker demand is reported normal as compared with recent weeks. Quotations are holding fairly steady.

### Anthracite Trade Turns Soft

New York anthracite consumers are taking things easy, most of them having put in enough coal to tide them over a few days of cold weather. Receipts have been cut down by frequent strikes at the mines but independent prices have not been affected to any material degree. Demand for stove coal continues in excess of the supply. Egg and chestnut move steadily, but pea, outside of the best grades, is hard to move. There is some activity in steam coal, buckwheat being in a little better demand, with rice and barley a trifle easier than last week.

The little splurge at Philadelphia occasioned by the brief cold spell soon disappeared and dullness has overtaken the retail men. The operator has not felt the dropping off in retail demand, as the dealer is trying his best to store away all the coal that is due him. Nut is in heavier demand and is extremely short with some shippers. There is a strong call for stove, but the gap between this and nut widens almost daily. All shippers continue to have some difficulty in moving egg and pea is almost as bad. Steam coals are quiet and the demand is fairly well met.

Continuance of mild weather at Baltimore has limited hard coal burning to a moderate amount. Supplies in yards are ample to meet all demands and there seems to be no scarcity of any particular size at present. The trade is much interested in just how much attention will be attracted by the coming exhibit in this city of burning devices for buckwheat size coal.

Soft weather at Buffalo is making it hard to sell anthracite. Consumers prefer to use gas, even if it costs more, as it gives so little trouble. Consumers seem indifferent of the future and refuse to buy coal when the weather is mild. They are looking for cheaper substitutes and they seem to find them.

Toronto dealers are quite busy, the setting in of cold weather having stimulated the domestic demand.

### Car Loadings, Surpluses and Shortages

	Cars Loaded			
	All Cars	Coal Cars	Surplus Cars	Car Shortage
Week ended Nov. 15, 1924.	1,015,704	188,229		
Previous week.	994,504	171,985		
Week ended Nov. 17, 1923.	992,050	170,998		
			Surplus Cars	Car Shortage
	All Cars	Coal Cars		
Nov. 14, 1924.	145,589	79,111		
Nov. 7, 1924.	116,448	60,097		
Nov. 14, 1923.	71,119	31,850		
			3,901	1,169



## Foreign Market And Export News

### Lean Foreign Trade in British Market; Slight Upturn in Output

Some improvement in the Welsh coal trade is evident due to the arrival of tonnage delayed by the recent heavy weather. Inquiries are more numerous but demand must show a much greater increase before business can be said to be anywhere near normal. Most of the collieries have enormous stocks of coal still standing, and it is the exception to find a pit working more than three shifts per week. Several pits have reopened this week but the relief to the heavy unemployment in the Welsh fields has been counteracted by the closing down of more pits. France is buying slightly more coal and there are more inquiries from South America. Italian business is very slow. Much foreign business is going to Germany and America.

The official audit of South Wales trade shows a net loss every month since the May wage agreement, the total loss for the first four months being £629,843. The October audit probably will increase this loss. Colliery owners are losing heavily on the present price basis and many contracts expiring at the end of the year will not be renewed. The future depends upon resumed production of European manufactures or on lower wage cost through an eight-hour day. It is stated that the miners' leaders are organizing for a reduction of working hours to effect the absorption of unemployed and also for an increase in the minimum wage from 8s. 3d. to 12s. per day.

The Newcastle market shows an all round slight improvement, but steams have made more headway than the other classes. Gas coal is in fair demand on the Continent. The situation here changed from an oversupplied and vacillating market to distinctly hardened prices. The Genoa gas works are asking for 30,000 tons of Durham gas coals for shipment from January to May, 1925, and Gothenburg for 10,000 tons of Wear gas coals for shipment from January to March, 1925.

Production by British collieries in the week ended Nov. 15, a cable to *Coal Age* states, totaled 5,232,000 tons, according to the official reports. This compares with an output of 5,137,000 tons in the week ended Nov. 8.

#### Prices Soften in Dull Market At Hampton Roads

The coal market at Hampton Roads is dull and prices are soft, with inquiries slackening and bunkers and coastwise alone holding their own. Foreign business is decidedly spotty and showing a tendency to decrease.

Supplies at the piers have been increasing and an increase in coastwise movement was reported. Piers have arranged to operate on Sundays in order to accommodate ships more readily, and this action has had a tendency to increase future business. As a whole the market is dragging.

Softening of prices is attributed to increased supplies at tide. Retail business is booming but has had no effect on the market as the winter's supply have already been provided for at contract figures.

#### Lower Output Not Likely to Affect French Market

With 23 working days in November—Nov. 1 and 11 are holidays in France—output is expected to be lower, but on the whole the situation is unchanged. There has been a slight increase in inquiry for industrial coals, due to heavier consumption in the plants and further pressure of sterling, which increases the cost of British coals.

Activity is relatively moderate in house coals and bituminous screened fuels are selling freely.

Deliveries of indemnity fuels to France and Luxemburg in October amounted to 516,700 tons of coal, 328,800 tons of coke and 39,300 tons of lignite briquets, a total of 884,800 tons.

In the first six days of November the total receipts were 64,300 tons, including 51,300 tons of coal; 3,900 tons of coke and 9,100 tons of lignite briquets. Deliveries were resumed on a normal scale Nov. 10.

Under the Reparation Commission's plan, the share of France in the apportionment of indemnity fuels between the Allies as from Nov. 1 will be 671,000 tons a month (250,000 tons of coke), but with the meager deliveries during the last fortnight it is doubtful that the Germans will be able to meet their commitments this month.

#### Export Clearances, Week Ended Nov. 29, 1924

FROM HAMPTON ROADS	
For Canal Zone:	Tons
Amer. Str. Ulysses, for Cristobal....	12,016
For Cuba:	
Nor. Str. Lisbeth, for Santa Lucia...	3,941
Amer. Schr. Rosemary, for Manzanillo .....	1,191
For Canada:	
Br. Str. Canadian Gunner for Charlottetown .....	1,502
For Brazil:	
Ital. Str. Attualita, for Rio de Janeiro	8,339
Br. Str. Pontypridd, for Santos .....	6,656
For Porto Rico:	
Amer. Schr. Virginia Pendleton, for Humacao .....	2,100
For Italy:	
Ital. Str. Posillipo, for Genoa .....	8,282
For France:	
Ital. Str. Emanuele Accame, for Dunkirk .....	11,945

#### FROM PHILADELPHIA

For Cuba:	
Nor. Str. Bessegen, for Havana .....	—
For Brazil:	
Br. Str. Dovenby Hall, for Rio de Janeiro .....	—
Br. Str. Golden Cape, for Rio de Janeiro .....	—

#### FROM BALTIMORE

For Porto Rico:	
Am. Str. Delisle, for San Juan .....	1,096

#### Hampton Roads Pier Situation

N. & W. Piers, Lamberts Pt.:	Nov. 20	Nov. 27
Cars on hand.....	1,229	1,158
Tons on hand.....	75,403	69,545
Tons dumped for week.....	95,895	105,526
Tonnage waiting.....	20,000	13,000
Virginian Piers, Sewalls Pt.:		
Cars on hand.....	1,984	1,840
Tons on hand.....	129,900	123,950
Tons dumped for week.....	94,492	95,128
Tonnage waiting.....	8,395	14,245
C. & O. Piers, Newport News:		
Cars on hand.....	1,554	2,073
Tons on hand.....	86,575	107,490
Tons dumped for week.....	135,696	66,806
Tonnage waiting.....	3,950	7,875

#### Pier and Bunker Prices, Gross Tons

PIERS		Nov. 22	Nov. 29†
Pool 9, New York....	\$4.75@	\$5.00	\$4.75@ \$4.85
Pool 10, New York....	4.50@	4.75	4.40@ 4.65
Pool 11, New York....	4.40@	4.55	4.20@ 4.35
Pool 9, Philadelphia..	4.90@	5.25	4.90@ 5.25
Pool 10, Philadelphia..	4.45@	4.70	4.45@ 4.70
Pool 11, Philadelphia..	4.30@	4.50	4.30@ 4.50
Pool 1, Hamp. Roads.	4.25		4.20
Pool 2, Hamp. Roads.	4.10		4.10
Pools 5-6-7 Hamp. Rds.	4.00		4.00

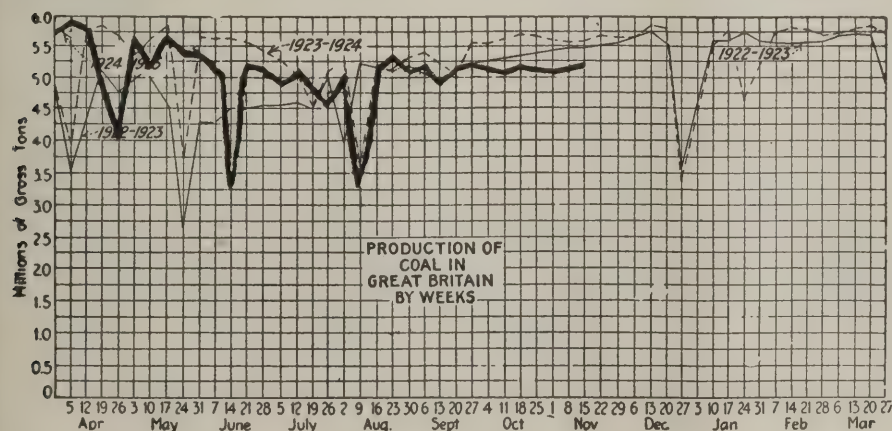
#### BUNKERS

Pool 9, New York....	\$5.00@	\$5.25	\$5.00@ \$5.10
Pool 10, New York....	4.75@	5.00	4.65@ 4.90
Pool 11, New York....	4.65@	4.80	4.45@ 4.60
Pool 9, Philadelphia..	4.90@	5.25	4.90@ 5.25
Pool 10, Philadelphia..	4.75@	4.95	4.75@ 4.95
Pool 11, Philadelphia..	4.50@	4.70	4.50@ 4.70
Pool 1, Hamp. Roads.	4.35		4.30
Pool 2, Hamp. Roads.	4.20		4.20
Pools 5-6-7 Hamp. Rds.	4.10		4.10

#### Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations by Cable to <i>Coal Age</i>		Nov. 22	Nov. 29†
Cardiff			
Admiralty, large....	27s. @ 27s. 6d.		27s. @ 27s. 6d.
Steam smalls.....	16s. @ 17s.		16s. @ 17s.
Newcastle:			
Best steams.....	18s. 3d. @ 22s. 6d.		19s.
Best gas.....	21s.		22s.
Best Bunkers.....	17s. 6d. @ 19s.		17s. 6d. @ 18s.

† Advances over previous week shown in heavy type, declines in italics.







## News Items From Field and Trade



### ALABAMA

The construction of two washers, one costing \$50,000 at Dora, and the other costing \$20,000 at Jagger, was announced by the Pratt Fuel Corporation. Operations will begin during December. The washers are of small types but are expected to care for the tonnages at these two mines. The company is engaged in other construction involving the appropriation of a large sum.

A report to the effect that the Woodward Iron Co. would add a number of Koppers ovens to its byproduct plant at Woodward has been officially denied.

Work is progressing rapidly on the new coal washery and alterations in the tippie at the Empire Mines of the DeBardeleben Coal Corporation, with completion of the improvements planned by Jan. 1. A Montgomery washer is being built and Deister concentrator tables are being installed for treatment of product from  $\frac{1}{4}$  in. down, which it is stated will reduce the ash content of the fines to a very low percentage. About \$100,000 is being spent on these betterments.

Forest fires burning near the Gamble mine, in Walker County, were communicated to the interior of the mine through the airshaft and ignited the coal, which is reported to be still burning. Scarcity of water has retarded the fight to extinguish the fire in the workings, and considerable damage is said to have been wrought at this writing. The mine is a small one operated by L. T. Bouchelle. No men were trapped in the workings as at first reported.

### COLORADO

R. K. Graham has resigned his position as superintendent of the Dick Coal Co. at Boncarbo. He is succeeded by Peter J. Miller. Mr. Graham has moved to California.

Effective Dec. 1, J. B. Marks was appointed assistant to the president of the Colorado Fuel & Iron Co. He also will continue to act as purchasing agent.

### ILLINOIS

Mine No. 1 of the Spring Valley Coal Co., Spring Valley, has resumed work at pick mining. About twenty-seven places have been opened and employment given to seventy men.

Theo. C. Keller, president of the Keller Coal Co., of Chicago, which operates big mines at Hillsboro, Taylor

Springs, Nokomis and Witt, has just been granted a fifty year franchise by the City of Witt to light the city. Keller is negotiating a similar contract at Wenonah, where one of the largest mines is located. He announces that a huge power plant will be erected at Witt to furnish power to run all the company's mines in addition to furnishing the city lighting.

The Spring Creek coal mine, located three and one-half miles northeast of Springfield, was scheduled to begin work Dec. 1, employing 400 men. The daily hoist will be 2,200 tons.

The Wall Coal Mining Co. of St. Louis, capital \$10,000, has leased the old Keystone Mine near Marion. The Cameron Coal Co. has operated this mine since 1917 with Frank W. Coal as superintendent and W. C. Coal, manager. Their plans for the future are not definite. H. W. Bradbury is the new superintendent and H. R. Wall, of St. Louis, is president.

The Cosgrove-Meehan Coal Co., which operates twelve mines in Pennsylvania and five in this state, has purchased the Panama mine on the Nickel Plate railroad, near Panama. This announcement was made by Enoch Carver, Jr., president of Cosgrove & Co., Inc., who are the selling agents for the Cosgrove-Meehan Coal Co. The Panama mine has a daily capacity of 3,300 tons and this will be increased to 4,000 tons. This company will now have the only two mines on the Clover Leaf division of the Nickel Plate.

Pen and pencil nightly replace the pick and shovel of coal-digger pupils enrolled in the educational department of Subdistrict 5, United Mine Workers, which has its headquarters at Taylor, Ill. Organized last convention time on recommendation of President William Daech, the department has proved its success by turning out more than 200 miners as graduates of the first course. Most of the work is done by the miners in their own homes, but they come together in seven different localities—Taylorville, Hillsboro, Panama, Nokomis, Pana, Kincaid and Tovey—twice a month, studying American history, economics and similar subjects.

William Van Dusene, Jonesboro, and associates plan extensive strip mine operations along the old right of way of the M. & O. R.R., near Millstadt. The company plans to purchase 1,000 acres between Millstadt and Smithton, mostly in the High Prairie neighborhood. Options have been taken upon 500 acres at a reported average of \$135 an acre. Drillholes will be sunk at once over this territory. In the High

Prairie region are many small mines, operated mostly by farmers. At one time there was enough extensive mining in this territory so that a narrow gage railroad, privately owned, was operated to Millstadt, where there was a tippie and standard gage railroad loading plant.

Production in the Shuler mine, at Alpha, on a recent day totaled 622 tons, which is a new high record for single day production at this new shaft. Approximately 100 men are employed. The mechanical equipment at Alpha provides for eventual output of 2,000 tons.

Announcement has been made that the Radium mine, owned by the Aluminum Ore Co., in the Belleville field, will be closed down indefinitely, possibly for the entire year. The company finds purchasing of coal upon the open market cheaper than operating the mine. More than three hundred men have been thrown out of employment.

### INDIANA

The West Jackson Hill Coal Mining Co. at Sullivan, has filed a preliminary certificate of dissolution.

A committee of operators of strip mines in southwestern Indiana headed by Roy E. Price, of the Stockton Coal Co., has proposed to Richard Lieber, director of conservation of the state, that the operators of these mines turn the land over to the state for game preserves. The committee proposes to give the lands to the state with the provision that the department reclaim them with native vegetation. The conservation officials are considering the offer.

With about eleven mines working daily in the Clinton field, a marked improvement in the mining industry is noticeable in that section. Not long ago not more than five mines were working. According to operators from that section, there likely is to be a gradual betterment in the industry.

A verdict of \$25,000 damages was given Nov. 21 in federal court in Indianapolis to James Gatherun, former mine boss of the Queen Coal & Mining Co. at Jasonville. Gatherun, who had been mobbed and chased out of town, brought suit against thirty-three residents, asking \$50,000, but charges against two of the thirty-three were dismissed. The case attracted statewide attention, since for a time Jasonville developed symptoms of becoming another Herrin. Among the defendants, who failed to give any support to the mine boss when miners concluded he no



longer was wanted, were the Mayor, Chief of Police, one patrolman and the financial secretary of the local of the United Mine Workers.

## IOWA

Drilling for coal at Bedford will begin at once. Three holes will be drilled at first, the expense to be covered by public subscription. Coal was discovered at Bedford in 1879, and there are a number of places in the vicinity where prospecting can be done. Since the establishment of a mine at Gravity, interest in the project has steadily grown.

## KANSAS

A movement to force a special convention of the United Mine Workers of District 14 to consider the removal of the present district officials and to place the name of Alexander Howat on the ballot at the biennial election in December was launched at a mass meeting of 2,000 miners in Arma, Nov. 16. The action was precipitated by the board refusing to place the names of Howat and more than a score of other candidates on the ballot on the ground that the international had ruled them ineligible. At the mass meeting copies of a form of resolution, the adoption of which by twenty locals would require the calling of a convention for not later than Dec. 4, were distributed.

## KENTUCKY

The Pontiac Mining Corporation has acquired the property of the Pontiac Coal Co., Madisonville, including coal mines, houses and other equipment.

The Swift Coal Co. will develop coal land in the neighborhood of Roxana, and will not only establish a plant but develop a mining town.

C. W. Johnson, attorney, has been named receiver for the Dixie Diamond Coal Co., retailers, 1201 East Main Street, Louisville, by Judge George A. Brent, referee in bankruptcy. Petition for receivership was asked by Harry J. Hood, president of the company, and John B. Carroll, receiver for the Looney

Creek Coal Co. Receiver Johnson was instructed to report on the advisability of continuing the operation of the company, as requested by Mr. Hood in the petition.

T. P. Middleton, Assistant Banking Commissioner, in charge of the Blue Sky Department, has granted permission to the Montgomery Creek Coal Co., of Vilco, to sell \$85,000 in bonds for the payment of company debts, the bonds to carry 6 per cent and to be issued to each creditor in amount not exceeding the sum due that creditor from the coal company.

It was stated at Harlan on Nov. 17 that the Wisconsin Steel Co., operating at Benham had increased its production to thirty-five cars a day and was operating six days a week since the election.

## MINNESOTA

The Clarkson Coal & Dock Co. has sold an issue of 6 per cent gold bonds in the sum of \$6,500,000. The money is to be used for refunding and for improvements. The bonds were snapped up as soon as offered which is considered a good sign by coal men of the Northwest.

## OHIO

The date for the sale of the assets of the Maynard Coal Co., of Columbus, which went into the hands of receivers William S. Harman and Frank L. Stein, about a year ago, has not been set but it is expected it will be offered for sale under order of court some time in December. The assets consist of working mines in the Pomeroy field in Ohio and the Hazard field in Kentucky. There are four large mines in Ohio and three in Kentucky. The Kentucky mines have been operated by the receivers and have been showing a good profit, but the Ohio mines are closed.

The LaBelle mine, at Steubenville, owned by the Wheeling Steel Co., of Wheeling, W. Va., was the scene of a recent explosion while 125 men were at work. All escaped without injury except one man who was seriously burned. The LaBelle mine is adjacent to the Brentwood mine, which claimed 119 lives in an explosion in April.

Jerome Watson, chief of the state mine division, recently learned also that miners had become ill from fumes and gases while working in the Blue Rock mine, owned by the Blue Rock Mining Co., of Zanesville, 17 miles east of that city. This mine had been sealed since the flood in 1913 and was opened in October, 1924. Inspectors were unable to locate the source of the gas. It is thought that the mine will be permanently sealed.

Quite a few coal men of Columbus attended a meeting of the Ohio Valley Shippers Advisory Board, which was held at Louisville Ky., recently. Included in the number were G. K. Mitchell, traffic manager of the New York Coal Co.; H. S. Morris, traffic manager of the Hocking Valley R.R., and others. William E. Tytus, sales manager of the Sunday Creek Coal Co., was named vice-chairman of the coal and coke committee of the board.

## OKLAHOMA

Ernest Ingram, assistant sales manager of the McAlester Fuel Co. for the past six years, has resigned and accepted the position of sales manager of the Gem Coal Co. of Henryetta.

## PENNSYLVANIA

A plot of ground at Larksville, near Wilkes-Barre, one-fourth of a mile square, dropped from 5 to 10 ft. early Nov. 26 as a result of a mine disturbance in the operations of the Hudson Coal Co. Five properties owned by the company were in the affected area, two of which were damaged beyond repair. Although the families in the sunken area and in the adjoining sections were thrown from their beds, there were no casualties.

The Pennsylvania Coal & Coke Co. and subsidiaries report an October deficit of \$40,359 before federal taxes, but after depreciation and depletion, against a deficit of \$10,431 in October, 1923. The deficit for the first ten months of 1924 totaled \$329,015, against a surplus of \$726,221 in the corresponding period of 1923.

The coal and coke business in the vicinity of the Connellsville coke region is still on the increase, although prices are remaining about stationary. The Century Coke Co., at Brownsville, with 205 beehive ovens, is preparing to resume operations next week, as is also Pike mine of the Hillman Coal & Coke Co., a union mine on the edge of the coke region at Brownsville.

Fire recently destroyed the breaker, blacksmith shop, wash shanty and air compressor room of the Wilson Hill Coal Co. at Simpson, causing a loss of \$30,000. Firemen prevented the flames from reaching a building in which powder was stored.

Directors of the Lehigh Valley Coal Co. held their monthly meeting last week, but did not announce a dividend. Since the separation of the coal and railroad interests, at which time much stock changed hands, stockholders have been waiting for a dividend to be



A Few Shovelfuls for a Chilly Day

This snapshot, taken late in October, shows a pile of domestic sizes of anthracite at the storage plant of the Hudson Coal Co., near Jermyon, Pa. The coal was mined during the last summer.



declared. Several meetings have been held without any action being taken. Efforts to elicit any further statement from the officials of the company other than that there had been no declaration of a dividend were unavailing.

## TENNESSEE

Leonard C. Crewe has resigned as president of the LaFollette Coal & Iron Co. and the Volunteer Fuel & Iron Co., both of LaFollette. Until Mr. Crewe's successor has been elected, S. S. Pratt, of LaFollette, vice-president of the company, is acting as president.

## UTAH

J. R. Roaf, engineer at the Kenilworth mine of the Independent Coal & Coke Co., left Dec. 1 to become superintendent of the Royal Coal Co. at Rolapp. Mr. Roaf has had considerable experience in the Crows Nest Pass country, in the Yellow Head Pass and Vancouver Island Coal fields in Canada.

Moroni Heiner, vice-president and general manager of the United States Fuel Co., of Salt Lake City, for several years past, has resigned the general managership and will be succeeded by D. D. Muir, of the United States Smelting, Refining & Mining Co., which has offices in the same building as the coal company. Mr. Heiner was one of the organizers of the company and holds a large block of stock in it. It was stated that he will retain his office of vice-president and still take an active interest in the company. He probably will take a rest on the Pacific Coast for two or three months.

## VIRGINIA

A dividend of 2½ per cent has been declared on the preferred stock of the company by the directors of the Virginia Iron, Coal & Coke Co. payable Jan. 2 to stockholders of record on Dec. 13.

## WEST VIRGINIA

The Shriver Coal Co. settlement on Scott's Run, an open-shop operation, was the scene of disorders Nov. 26 during which a child was seriously wounded and an attempt made to dynamite the tippie. Two explosions ripped out a part of the approach to the tippie and damaged the loading apparatus. The blasts were followed immediately by rifle shots from a hillside. Sarah Rokys, five years old, standing in the doorway of the cabin occupied by her parents, suffered a wound in the chest. Attending physicians said she could not live.

Following closely on the heels of the election, the Pulaski Iron Co. ordered the immediate firing of its entire battery of 600 coke ovens at Eckman. It is stated that active preparations are now being made to assemble the necessary working forces to put the ovens in blast.

Late in November a large number of new coal cars for the Pinnacle and Crane Creek operations of the American Coal Co. were received. The plants of the company are working regularly

and are loading more coal at present than at any time during the year.

Figures compiled by the Chesapeake & Ohio show that there were 43,339 cars of coal loaded on that road in November, up to and including the 18th, with every prospect that the heavy loading of October will be equalled in November. Loadings by fields during the first eighteen days of November were as follows: New River, 10,186 cars; Kanawha, 6,336; Coal River, 3,512; Logan, 18,481; Kentucky, 4,823.

W. A. Richards, of Pottsville, Pa. has been made general manager of the Pemberton Coal & Coke Co., in the Winding Gulf district; the Ashland Coal & Coke Co., in the Pocahontas district, and the Majestic Collieries Co., operating on the Kentucky side of Tug River in the Thacker district. The total output of the mines of the companies mentioned will average over a million and a half tons per year. The new general manager is the son of W. J. Richards, president of the Philadelphia & Reading Coal & Iron Corporation, and has been identified with the coal industry since he was a young man. He is a graduate of Lehigh University. Mr. Richards will have his headquarters for the present at Ashland.

Since the early part of November the Nuriya Smokeless Coal Co., operating at Nuriya, nineteen miles west of Mullens, of which W. H. Ribt is general manager, has been running its mines regularly and giving its men daily employment.

Deputy sheriffs and state police have been investigating an explosion that wrecked the aerial tram coal conveyor of the Clarksburg Big Vein Coal Co.'s mine west of Adamston a few days ago. The mine was out of commission for several days as a result of the explosion, which entailed damage to the extent of about \$2,000, according to officials of the company. The company has been operating on a non-union basis since April 1 last. The explosion was the second one at the same mine within four months. Another explosion occurred not long ago at the Fort Pitt mine at Wilsonburg, the owners of which are affiliated with the owners of the Big Vein mine.

## WYOMING

By Dec. 1 the sixteen mines of the Union Pacific Coal Co. in Wyoming were all equipped with Edison permissible cap lamps. The electric cap lamp has been used at the Cumberland and Hanna mines of the company for several years, but it is only within the past two weeks that they have been adopted in the Rock Springs area.

The Rock Springs chapter of the Rocky Mountain Coal Mining Institute held its November meeting at Reliance, Nov. 20. This chapter has adopted a program for the winter which will cover the study of mining conditions in southwestern Wyoming, members giving reports on the different problems at each monthly meeting. As the membership is scattered through the several camps around Rock Springs, a meeting will be held at each place. Miners in-

terested in problems of the industry are being encouraged to join this chapter.

The Water system being constructed by the Union Pacific Coal Co. at Reliance is nearing completion and the company has its geologist conducting a survey of the Superior vicinity in search of a better water supply for that camp.

Jack Smith, safety engineer for the Union Pacific Coal Co., returned Nov. 21 from a trip to Trinidad, Colo., and Raton, N. M., where he was studying the rock-dusting methods used in those fields.

## CANADA

The railroads are finding that they need only about 75 per cent of the steam coal they had stored for consumption, as the grain crop is much smaller than was expected. The result is that the steam coal mines in the West are obliged to shut down, as was the case at Fernie and Coal Creek. The Drumheller mines are all working on orders for the prairies, mostly for Manitoba and Central and Northern Saskatchewan.

The One Big Union is having difficulty in functioning in Springhill. Ben Legere, organizer, from Lowell, was not allowed to speak indoors on the ground that permission of the local officials of the United Mine Workers must first be obtained. Legere failed to obtain this consent and was forced to address his followers and others from the front of the hotel in which he was, a guest. About 65 per cent of the Springhill local has decided to remain within the miners' union and will not affiliate with the Communist or the One Big Union factions.

## New Companies

The Daisy Coal Co., Krypton, Ky., capital \$10,000, has been chartered by William Stott, Daisy Stott and Edgar Harris.

The Miners' Co-Operative Coal Co. has been chartered with an authorized capital of \$15,000 to mine coal in the Bergholtz (Ohio) field. The incorporators are: J. C. Stabley, Steven C. Tolick, J. P. Kinney, Patrick Harvey and J. E. Guy. This is one of the many co-operative mines being opened in Ohio.

A new coal company launched in West Virginia about the middle of November was the Inspiration Mining Co., with headquarters at Clarksburg. The company has a capital of \$25,000. C. D. Floyd and associates organized it.

The Coaton Colliery Co., P. O. Building, Wellston, Ohio, has been chartered with an authorized capital of \$25,000 to mine and deal in coal. Incorporators are W. H. Parker, Grant McGhee, George Shook, H. R. Kisor, A. M. Scott and L. E. Vogelsong.

Papers have been filed chartering the Liberty Coal Mining Co., of Columbus, Ohio, with an authorized capital of \$10,000, to mine, buy, sell and deal in coal. Headquarters have as yet not been established but they will as soon as suitable location is found. A mine is being operated at Moxahala, Ohio, in the Syndicate field, on the T. & O. C. R.R., mining Hocking No. 6 coal. Chas. A. Brunner, Albertus M. Steck, W. W. Daniel, Harold J. Roberts and Edward S. Beard, all familiar with coal operations, are the incorporators. Officers as yet have not been elected.

Papers have been filed incorporating the Bituminous Collieries Co., Cleveland, Ohio, with a capital of 3,750 shares, no par value designated, to mine coal and deal in coal and coke. Incorporators are Frank T. Kerr, William R. Butcher, Jr., Lawrence E. Imhoff, Winifred A. Gray and John C. Nichols.



## Traffic

### Seek Freight Rate to Throttle Non-Union Mines

Harlan (Ky.) operators have been advised that an effort is being made to bring pressure to bear on the Interstate Commerce Commission to impose a freight rate differential of 75c. a ton on coal going into the Northwest from the Harlan district, as compared with coal moving from the Central Competitive or union fields. It is claimed that Central operators as well as union labor would like to throttle the non-union Kentucky sections.

It was reported from Harlan on Nov. 22 that the Louisville & Nashville R.R., with an average of 1,067 cars of coal daily off the Cumberland Valley Division had set a new week's loading record for the division. It is also stated that there will be some double tracking of the division next year, due to great increase in tonnage handled.

### Sustains Reduced Coal Rate To East St. Louis

Judge Crow, at Belleville, Ill., has sustained an order of the Illinois Commerce Commission ordering a 21c. reduction in coal rates to East St. Louis from mines within a radius of 20 miles of East St. Louis. He ruled against the 30-mile radius. The new rate is to be 71c. on coal within the 20-mile circle and 91c. on coal beyond in what is now the 91c. rate field. The important Mt. Olive and Staunton fields are outside, as well as the Sparta, Marissa and Coulterville groups. Coal moving out of Illinois will not be benefited—the rate is local to East St. Louis only. It is likely that the railroads and important operators in the territory discriminated against will further contest this order.

### Rates Shaded in South Dakota

The South Dakota Railroad Commission announces some concessions in freight rates on coal to various points in that state, principally the western part. Reduced rates have been arranged from the docks on Lake Superior and Lake Michigan to territory west of Chamberlain and Pierre, on the Missouri River. Another reduction is expected to points on the Pollock branch line of the Soo and also on the Fairmount (N. D.) line which extends into South Dakota. Reductions have been made from the Illinois mines to western parts of South Dakota.

## Trade Literature

**W. A. Jones Foundry & Machine Co.**, Chicago, Ill., in its catalog No. 29, on gears, covers the subject quite extensively. It contains 224 pp.

**Illinois Chain Grate Stokers**, Illinois Stoker Co., Alton, Ill. Third edition of Catalog L. Pp. 62; 8 x 11 in.; illustrated. Embodies a complete discussion of type A (natural draft) and type G (forced draft) stokers. A number of blueprint drawings are included, and the catalog should prove valuable to power-plant operators.

**Tipple Equipment**, Fairmont Mining Machinery Co., Fairmont, W. Va. Pp. 32;

8 x 11 in.; illustrated. Describes the different installations made throughout this country by this company. The book is well illustrated.

**Herman H. Sticht & Co.**, 15 Park Row, N. Y., manufacturers of electrical and industrial instruments, have just announced the publication of a new bulletin No. 123 on the subject of **what constitutes safe insulation**. This little bulletin explains in a concise manner how and why electrical insulation breaks down. It also points out the value of periodically testing all electrical equipment.

## Industrial Notes

**The John F. Folkers Engineering Corp.**, Mobile Ala., has been appointed agent to handle sales and service for the **Triumph Electric Co.**, of Cincinnati, in the Mobile territory.

**The Hitchman Coal Co.** is having a new conveyor system installed at its mine at Moundsville, W. Va., by the **Fairmont Mining Machinery Co.** The conveyor is to be somewhat similar to those used at Lorain and will be utilized in coaling all Baltimore & Ohio engines at the western end of the Wheeling division as well as to load coal in cars for shipment. This conveyor will reach a short distance into the shaft of the mine, where a new type of coal car especially designed for conveyor work will bring the coal from the various sections of the mine to the conveyor pit, from which point the coal will be carried to the top of the tippie ready to be shipped out. As soon as the new conveyor system is completed the large coal tippie, extending the full distance from the mine over the B. & O. yards and out over the storeroom department of the local railroad will be torn down, although only recently reinforced by cement foundations and cement holdings along the side girders.

**W. F. Hebard & Co.**, 551 W. Van Buren St., Chicago, Ill., has been appointed to act as sales representative of the **Ironton Engine Co.**, in the Chicago district, particularly in connection with Ironton storage battery industrial locomotives.

## Association Activities

At a general field meeting of the **Winding Gulf Operators Association** held in Beckley, W. Va., late in November, the association passed a resolution opposing the proposed child labor amendment to the federal constitution. The association also expressed appreciation of the assistance of Col. W. J. McClaren of McDowell County in giving impetus to road building in West Virginia. Colonel McClaren has resigned as road engineer of McDowell County.

## Obituary

News was received at Lexington, Ky., on Nov. 25, of the death in a hunting accident at Umatilla, Fla., of **J. W. Reedy**, 50, formerly a prominent coal operator of Lexington, Ky. He was formerly associated with C. R. Luttrell, of the Montgomery Creek Coal Co., at Vico, in Perry County, Ky.

**Thomas Worth Currie**, age 36, who had been connected with the New Castle Coal Co. for a number of years and was well known in coal circles, died Nov. 22 after a short illness with pneumonia. Mr. Currie is survived by a wife, two children and several brothers and sisters.

## Coming Meetings

**West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers**. Fourth annual convention, Dec. 12 and 13, Huntington, W. Va. Secretary-Treasurer, Herbert Smith, Huntington, W. Va.

**American Institute of Mining and Metallurgical Engineers**. Annual meeting, Feb. 16-19, 1925, 29 West 39th St., New York City. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

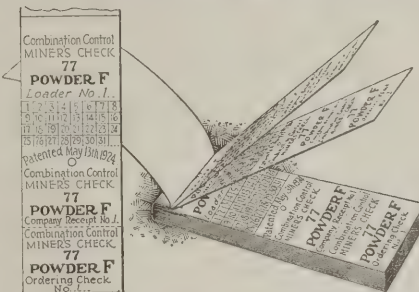
**American Institute of Electrical Engineers**. Midwinter convention, Feb. 9-13, 1925, 29 West 39th St., New York City. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

## New Equipment

### Ends Disputes About Powder

One source of friction, difficulty and misunderstanding between miner and management at many coal operations is the alleged faulty issuance of powder or other explosive. In the past this in many cases has constituted the root of much unpleasantness, sometimes bordering upon hostility.

In order to forestall all possibility for misunderstanding in this regard **Frank Zgol of Sandoval, Ill.**, has in-



### TriPLICATE Check and Check Book

One stub is given to the magazine keeper as an order for powder, one is hung on the outside of the miner's tool box to be taken up by the powder-car driver as a receipt and one is retained by the miner. All stubs bear the miner's check number.

vented and patented the system of triplicate checks shown in the accompanying illustration. As may be seen one of the check stubs carries a calendar on which the date when powder is ordered or delivered may be marked. This stub is retained by the miner.

One stub is given to the powder-house keeper and constitutes the order for powder. The third stub is attached to the miner's tool box and is collected by the man who delivers the explosive. It becomes the company's receipt. The driver of the explosives' car will not deliver powder to any tool box unless such a receipt stub is hung on the outside of the box. These triplicate checks can be made up in book form for convenience.

### Build Electric Locomotives on Lines of Steam Units

It has often been said that the coal industry in the solution of its great transportation problem might advisedly emulate the example of the railroads in the design of its rolling stock. This unquestionably is in large measure true, for railroad construction today is the outcome of many years of experience. Although the problem of railroad transportation differs radically from that of mine haulage, requiring in many respects a different type of construction, yet their many points of similarity render the adoption of certain details of construction highly advantageous.

With some such idea as this in mind, when the Vulcan Iron Works, of Wilkes-Barre, Pa., some months ago set about designing a line of electric locomotives, it drew liberally upon the experience



gained in its many years of steam-locomotive building. Among the important constructional details that in a measure have been borrowed or adapted from the design of steam locomotives are the bar frames and the three-point suspension of the entire chassis. The brake rigging employed also has been adopted in a large degree from steam practice.

Taking up these constructional features in greater detail, the bar frame is simple in design, easily constructed and amply strong. In these machines each side frame is cast in one piece of steel. While abundantly rigid, such frames permit practically a free circulation of air, thus affording adequate ventilation to the motors and other parts. Furthermore all parts of the machines within the frames may be readily seen and inspected through the openings in these members.

#### RIDING AND TRACKING EASY

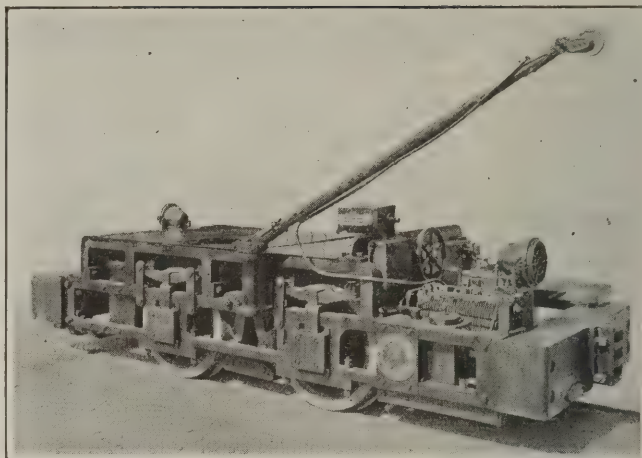
In the past many attempts have been made to equalize the weight carried by the several drivers, but only a mediocre degree of success has been attained. In these locomotives the same principles of design have been followed and as far as possible the same construction has been adopted as has proved so successful in the building of steam machines. The springs are built of semi-elliptic leaves. On the trolley type of locomotive one set of springs supports the frame directly through hangers. One end of the other pair of springs is held by hangers, the opposite ends engaging an equalizing bar extending across the machine supported in the center.

By this means the locomotive is enabled to follow without difficulty any ordinary inequalities in the track. In the storage-battery type of locomotive a similar result is accomplished by connecting the inner ends of the springs by means of a system of equalizing levers, links and bell cranks.

In the trolley type these locomotives are built regularly in 4-, 6-, 8-, 10-, 12- and 15-ton sizes. The storage-battery machines are built regularly in 6-, 8- and 10-ton sizes, the battery making up about one-half this total weight. Any standard battery may be used, either of the lead-acid or nickel-alkali types. Removable battery boxes (so arranged that one battery may be lifted bodily

#### Trolley-Type Locomotive

This machine has the type of suspension that has proved successful on steam locomotives. The brake rig has also been adapted from steam practice as well as the frames and springs. Bumpers and drawheads may be made of any type to suit the cars to be handled.



from the machine and charged while the locomotive is operating from another battery) are sometimes used.

Usually steel-tired iron-center wheels are used on these locomotives. However, rolled steel wheels or cast-iron wheels with chilled treads may be applied. Bumpers and drawheads may be made of any desired size, shape or height to suit the cars to be hauled. The trolley type of machine is fitted with the ordinary wheel-crank brake. The storage-battery type on the other hand is supplied with a quick-acting, self-locking brake consisting of a lever actuating a cam. Throwing this lever through half a circle applies or releases the brake which is self-locking both in the on- and off-positions.

Either type of these locomotives may be built to any track gage from 30 in. to standard (4 ft. 8½ in.). The wheel base may likewise be varied within reasonable limits, as may also the height.

#### SINGLE-MOTOR BATTERY LOCOMOTIVE

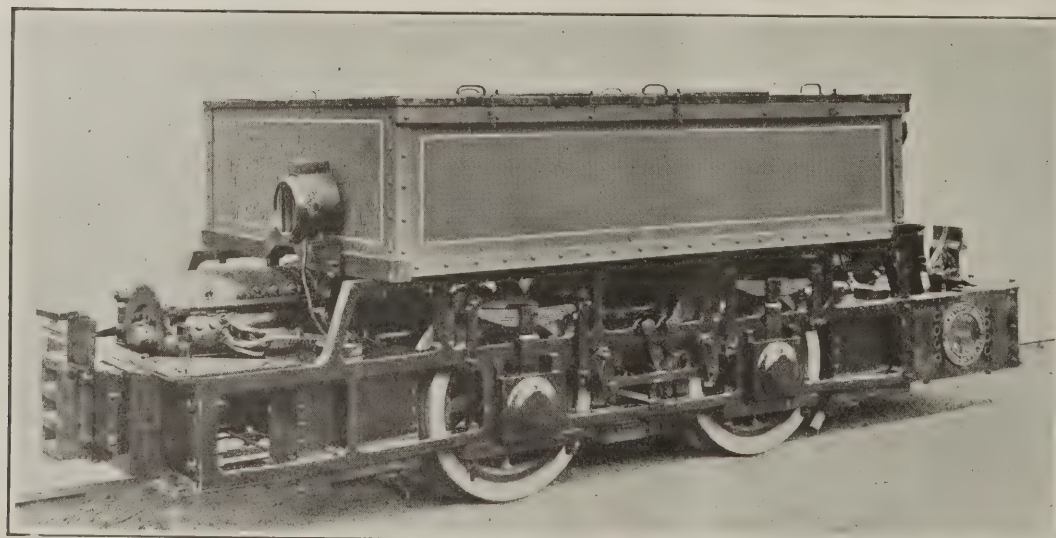
In the storage-battery locomotive only one motor is used, this being mounted at the forward end of the locomotive just in rear of the bumper. By means of a segmented shaft, flexible couplings and worm-gearing, motion is transmitted from this motor to the driver axles, thus utilizing a type of drive the utility of which has been proved in motor vehicles, automobiles, cars, trucks and tractors.

The side frames are planed upon one side and along the upper edge, the dis-

tance pieces spanning the journal openings are mortised into the frames as well as being bolted into place, and the bolts holding these distance pieces in position are not only lock-nutted but are provided with projecting ends so that even when they are upset in hammering out a bolt the thread itself is not injured.

#### Disconnecting Switch Well Insulated and Protected

An inclosed primary disconnecting switch for use in vaults ahead of the oil circuit breakers on circuits of 4,400 volts and under in capacities from 100 amp. to 400 amp. has been placed on the market by the Line Material Co. of Milwaukee. The box is made of seasoned wood, painted inside and out with two coats of weatherproof paint, has dovetailed joints and is put together with screws. "Transite" barriers are used between switches. The door is hinged on both sides and can be padlocked if desired. A pull stick is mounted on the inside lower end of the door. Brown glazed porcelain bushings at top and bottom of the box provide for the wires, and the flexible contact clips are mounted on wet-process porcelain petticoat insulators which are securely bolted to a channel base, which is in turn bolted to a channel box to channel-wall straps extending each side of the box with holes for attaching to the wall. The box can be closed with the switches open.



#### Storage-Battery Locomotive

One motor, with shaft parallel with the track, is used on this machine. This transmits its power through a segmented shaft and worm gearing to the axles. Pressure on the journals is equalized through a system of levers and bell cranks.



# COAL AGE

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JAMES H. MCGRAW, *President*  
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Devoted to the Operating, Technical and Business  
Problems of the Coal-Mining Industry

R. DAWSON HALL  
*Engineering Editor*

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## What Is Safe?

MANY of us are ready to call safe that which can be used safely, but in practice we need a stricter definition and may define a safe device as one that probably or generally will be used with safety. When the life of one or two is involved that will serve as a definition of "safe" but when the lives of hundreds of men are jeopardized as a result of a single indiscretion we begin to take the view that only that which can never be used unsafely is safe. It is in some such sense that Dan Harrington has discussed the flame safety lamp and declared it unsafe. It is in such a way that we can designate the electric safety lamp safe and justify our designation.

Flame safety lamps, like certified explosives, at best can be designated merely permissible, not safe. Safe indeed they may be termed if they are used rightly. Used wrongly they are dangerous. The word "safe" where anything is so only when used rightly is a dangerous word—a bar to safety, a hindrance to progress. We need better flame safety lamps and better explosives and the words permissible or permitted would serve to emphasize that fact.

## Hygroscopic Dusts

WHERE is the cheap non-hygroscopic dust that will remain dry in a damp atmosphere? Alas, we know of but one—coal—and that is so explosive that we wish it were hygroscopic. Perhaps, however, there are others that, placed in a rock-dust barrier, will keep their condition. Nearly all the components of the earth take up moisture and bind themselves into rocks. In the crusher we merely reverse conditions temporarily. Time, which bound the rocks together in the past, soon binds the separated particles together again and laughs at all our efforts.

Nowhere do we need permanence of condition more than in our aircourses where it is so difficult to replace the dust and where frequent ingress and egress through the stoppings makes it difficult to prevent leakage of air. If we must make our stoppings temporary we are almost obliged to have them leaky, thus reducing the efficiency of the air on which safety so greatly depends. Find us then this non-explosive, non-hygroscopic dust, ever ready, no matter how long it has lain, to rise in a cloud when occasion demands.

Crockery, vitrified-brick and marble dusts are perhaps suitable. Shall we come, therefore, to the time when barrier dust and perhaps all dust for rock dusting is first vitrified and then crushed? Shall broken crockery, overburned brickbats, marble-quarry waste, slags and cinders, especially the cinders from the burning of pulverized coal, be our most dependable source of supply? Will these be found harmless to the respiratory organs? And if they are injurious shall we use them only in unused return aircourses or in suspended or shelf barriers where they cannot injure anyone?

## Keep Hoover's Men Abroad

COAL operators, especially those of the Crescent groups with a direct interest in America's coal export trade, might well speak a good word to their Congressmen for the Winslow-Jones bill. This measure, which did not pass at the last session of Congress because it came up too late to get on the calendar without a suspension of rules, would make permanent the foreign service of the Department of Commerce. As it is, the fourteen commercial attachés, forty-two trade commissioners, thirty-five assistant trade commissioners and nineteen American clerks in the department's forty offices scattered through the trade centers of the world never know whether their jobs are to continue until Congress periodically acts upon the departmental budget. If an appropriation sufficiently large is made, they continue; if not, they don't.

Permanency for this foreign service should be provided. Surely it has justified itself during the years that it has been functioning since 1913, and especially since the war. Coal men interested in export trade never before had such an adequate insight into coal market conditions abroad as they have now. Periodic and accurate information laid on their desks regularly and with frequency has taken much of the guesswork out of export. It has brought information that meant business. It has educated a good many coal men who needed educating. This service, which is a small part of the benefit American business reaps, certainly should be continued—with guaranteed permanence.

## Let the Foreman Do It

WE MUST get away from the idea that the foreman must do everything. It is surprising that we did not pass laws to make him test the places for gas before the miner went into the mine. One wonders why we did not require him to set all the props, so eager were we to ask the foreman to assume all the jobs in the mine that carried any degree of responsibility. Much better would it be to prescribe for him a certain number of helpers in a given area of operation and to require them to be capable.

In Great Britain the custom has been, as in Illinois, to put unreasonable restrictions and burdens on the manager. It has only made of the manager an official of lower caliber. The laws regarding the mine foreman are equally unfortunate. When the foreman is required to do more work than is physically possible, he neglects part of it. He does his best perhaps but usually the work required of him by the state goes by default. This is what always happens when we ask the impossible. "Let the foreman do it," is an unsafe cry. "Let him delegate it to a sufficient force of capable men under his supervision and direction," is a counsel of moderation that will end in our getting more closely what we seek.



## White House Wages

SAYS Holy Writ, "Agree with thine adversary quickly whilst thou art in the way with him, lest at any time the adversary deliver thee to the judge and the judge deliver thee to the officer and thou be cast into prison." With some such point of view the union operators signed the Jacksonville agreement. They had tried on several occasions to disagree with their adversary, the United Mine Workers of America, but the public and the administration had always been found to have their faces set against them, and they decided that on this occasion they would agree with their adversary without delay before the irate public ventured to take them by the neck and regulate or nationalize them.

The Jacksonville agreement seemed quite plausible. The price of coal it is true, was not high, not high enough to meet the old wage scale satisfactorily, but if the wage rate was decreased the price would be lowered in an equal degree, for the non-union operator would be well justified in the minds of his own men and in that of the union in reducing wages accordingly. So nothing was to be gained by lowering wages 10 or even 20 per cent. It was hoped that the non-union mines, which had been subject to continued attacks from the union when paying relatively high wages, would hesitate to cut wages drastically and thus invite union activity. In fact the non-union regions were rather doubtful as to the advisability of any such action and did not want to cut wages, but competition among themselves soon brought them to such a pass that they had to cut them more and more until they had pared them to the quick. The non-union men accepted these successive reductions, and the union mines were left high and dry with no market. Even their men, in places, deserted them to get work in non-union regions.

The trouble with the Jacksonville agreement was that it provided for a three-year continuance. It was conditioned on nothing. The union operators cast their future to the winds for three long years. They mortgaged their very existence for a period so long as to jeopardize their stability. Business can hope over a season or a year, but it looks askance at three years of no market.

At an appeal to patriotism and interest in the public weal the operators agreed to the Jacksonville wage scale. Did the public, which requested it, agree to buy of those that paid it? Not at all, not for one instant. They bought where they could get coal cheapest. They imposed the wage but they refuse to pay it. Thus they euchred the union operators. Will the operators feel again the compulsion to sacrifice themselves to the public weal? We think not. They will never again agree with their adversary quickly, regardless of judge and officer.

They have a right to consider their own interests in the matter. It does not concern the operator much what the miner is paid; he would sooner pay a big wage than a small one, but if the public wants to set the wage for certain operators and not for others it should buy from both its accustomed percentage. Conversely, if the public, as indeed it always does, wants to buy open shop, from union or non-union mines alike as is its pleasure and its right, it should set the wages for all alike or set them for none of them. However, the public should not regulate wages in non-union mines; it should recognize the right of mines that are unionized to make their own contracts without public pressure.

## Facing the Inevitable

NO ONE can fail to sympathize with Warren Stone, of the Brotherhood of Locomotive Engineers. He, probably, with a lot of budding capitalists and with some who have been in business many times already doubtless, believed that he could be a new type of industrialist who would pay high wages, give his men the best of working conditions and be hailed as a benefactor of mankind. Many working men and salaried employees of corporations, when they first enter the capitalist class, have such dreams. All honor to their ideals even though in nearly every case they have failed to make their visions realities.

Those who have are engaged in some business, hedged by patents and copyrights and free from labor agitation. Some others have managed to transfer their ideals to the field of operation, but they were in newly established industries where quantity production had not been attempted hitherto and where prices were, therefore, much higher than the nature of the product would warrant. But if Warren Stone wanted to be free of the stress of competition, if he wanted to make such profits that he could divide liberally with his employees and yet have usufruct for his toil and money, why did he attempt to go into the coal business? There have been years in the coal industry when such beneficence was possible, but 1924, as Warren Stone now recognizes, is not one of those years. At least the coal business in 1924 is not one in which that result can be attained. Probably the Brotherhood will realize that it will do well to enter industries which, like banking, employ little labor and have never known a union.

The mine workers have taken action against many of their numbers who have entered the troublous arena of life as capitalists. They have never escaped dissension and innuendo. Others have tried to act as combined workmen and capitalists, forming what is termed a "co-operative mine" and they have been threatened with expulsion from the union and practical boycott, because co-operation in gain means co-operation in loss, and so the men were soon working for what amounted to a concession in wages.

Stone has tried to be a capitalist with union money, and he is finding himself more handicapped than the mine worker who openly enters the capitalist class for his own gain. He has found himself facing both ways—a union man with regard to his brotherhood and a capitalist with regard to the United Mine Workers. The pipe dream has been nothing but rings of smoke. It cannot succeed, and it is likely that the unions may before long decide definitely that there is no halting between the union and Mammon, and that union men should cease to retain cards of membership as soon as they become capitalists.

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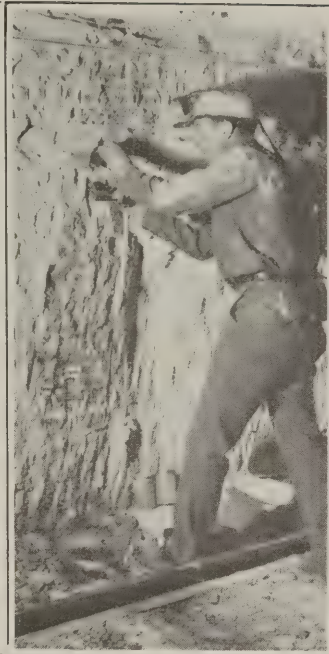
IN ALL THE RECENT CHARGING and countercharging in the battles over child labor legislation, the coal mines of the country cannot after all, be accused of much offence. In spite of the pictures often drawn of worn, emaciated little boys toiling pitifully underground in coal mines, statistics of the 1920 census show that the total number of boys under 15 employed in all mining and quarrying was only 7,191. After deductions have been made for operations other than coal, there remains comparatively little child labor for which the coal industry can be held accountable.



# Advances in Mine Plants and Safety Are Themes of Coal Mining Institute of America

Nicholas Evans Elected President for 1925—Sayers Discusses Effect of Excessive Dust, Heat and Humidity—Dawson Relates Nature and Advantages of Colonial Conveyor System—Detailed Discussion of Rock Dusting

BY R. DAWSON HALL  
Engineering Editor, *Coal Age*



**L**ARGE numbers were down to the forty-eighth annual meeting of the Coal Mining Institute of America, at Pittsburgh, Pa., Dec. 3, 4 and 5, to hear about the belt conveyors at the Colonial Docks and about rock-dusting developments and to see the former working in the H. C. Frick Coke Co.'s mines and the dusting machines and dusted roadways at Indianola.

Business was quickly disposed of. The members learned from H. D. Mason, the secretary-treasurer, that the 2,661 members were increased by 350, due to new admissions at this meeting, bringing up the number to 3,011, that J. M. Armstrong, general manager of the Pittsburgh Coal Co., was responsible for bringing in more than one-half of the new members. They also learned that the finances were in better condition than ever in the history of the organization. They accepted the report on the Use-Classification of Coal and continued the life of the committee which reported, charging it with the duty of seeing that its recommendations be carried into practice.

The committee took Dr. Ashley's classification, modifying it only by using the percentages of volatile matter to the whole coal content on a moisture-free and ash-free basis. Dr. Ashley had favored allowing for 7 per cent of ash in the coal and estimating the volatile and fixed carbon so as to total 93 per cent, leaving a standard ash of 7 per cent. The committee viewed this as a somewhat artificial way of bringing the specifications to a comparable basis and not so productive of advantage as of misunderstanding, and decided to base the classification on an ash-and-moisture free basis instead, placing the dividing lines in the classification at even 7-per cent differences in volatile contents.

The tellers announced the election of Nicholas Evans as president, with 499 votes; J. M. Armstrong, first vice-president, with 463 votes; A. C. Fieldner, second vice-president, with 364 votes; W. C. Hood, third vice-

president with 315 votes; and H. D. Mason, secretary-treasurer with 566 votes.

M. D. Cooper, outgoing president, read an address on the "Positive Side of the Mining Industry," declaring that too much had been said about the faults and frailties of the business of coal mining and too little about its progress and about other qualities deserving of public approval. Other points he made were that greater continuity of operation was desirable and that this could be attained only by coal storage; that such storage was a matter rather for the consumer than the operator, for the latter could always produce enough to satisfy the consumer if the railroads could haul it. He said that storage serves the public best if done at destination rather than at the mines, despite the public's notion that coal should be stored where it is produced. He declared himself opposed to a Department of Mines. The creation of such an instrumentality, though it would elevate certain officials, would bring the Bureau of Mines into politics, of which hitherto it had managed to keep itself clear.

## KEEPING THE STANDBY LIMBER

Graham Bright then presented his paper on "Recent Electrical Progress in Coal Mining," which appears in this issue of *Coal Age*. W. L. Affelder, taking the chair for the discussion, Mr. Writh asked at what frequency and for what length of time should the standby unit be operated to be sure it always would be in condition for an emergency. He said that at a pumping plant in Oklahoma the standby was tested once a week for three minutes and it had been found possible to get the emergency unit operating in one minute from the supposed moment of breakdown of the regular unit.

Mr. Bright said he did not know how often the Youghiogeny & Ohio unit was tested but that when the mine was running, the emergency unit was operated at frequent and regular intervals. Asked by Mr. Affelder as to the cost of an installation such as that of the Youghiogeny & Ohio, he said that there were some refinements in the design of the standby engine that were hardly necessary, he thought, for a plant the

NOTE—Headpiece shows C. H. Dodge, research fellow on dusting, taking a sample in the No. 8 mine of the Pittsburgh Terminal Coal Co. The dust clinging to the ribs and roof in a strip 6 in. wide is carefully collected. About  $\frac{3}{4}$  lb. of that portion of the dust that will pass through a 10-mesh screen is put into one of the containers shown on the bottom and constitutes a sample.



operating economy of which was not a vital or even an important point. Such a plant with less elaboration but sufficient for all purposes could be constructed for \$6,000 to \$7,000.

H. J. Evans, of the Mather Collieries Co., said that his company's steam-engine standbys used only about 80 tons of coal a month. They did not require the services of a single man, for the power-house attendant kept the boilers fired. He said that the cost of the standby plant, which was built originally for the operation of the hoist and fan, was more than \$25,000. The emergency unit could be gotten into line in four or five minutes and with it men could be hoisted and the fan operated.

J. J. Rutledge, chief mining engineer, State of Maryland, said that in the Dolomite disaster the emergency equipment was brought into operation within seven minutes after the explosion. It undoubtedly saved many lives. It cleared the mine in a short time.

W. L. Affelder said he did not want to suggest to the mine inspectors what they should do, but he believed it might be well for them to require the testing of auxiliary equipment at mines when visiting a coal plant, just as some of them were requiring a test to be made of the overwind devices.

W. L. Maize said that when the Nemaquin mine took out its seven boilers and put in purchased power it laid off no less than sixteen men who in the course of twenty-four hours were employed at the boilers of that plant. He fully realized what it meant to maintain a steam standby.

In answering Question No. 1, which inquired why the Pennsylvania bituminous mining law demanded that "For work underground when supplied by current at voltage higher than medium voltage no transformer shall have a normal capacity of less than 5 kw., nor shall any motor have a normal capacity of less than 15 hp." Mr. Bright said that with 2,200-volt alternating-current the wire would be so small that a reliable motor or transformer could not be made. This was the objection from a manufacturing standpoint. Viewed as a mining matter, he would say that equipment so small would be regarded with more or less indifference and therefore might be neglected. Mr. Bryan remarked that where 440-volt alternating current was used for transmission the requirements as to size seemed too small.

#### CONDEMN 500-VOLT CIRCUITS

The question whether a voltage of 500 is reasonably safe for all working conditions in 3½ ft. of coal developed no conflict of opinion. Joseph Williams, Nicholas Evans, W. L. Maize and William Langan agreed in condemning it, wondering, however, if anywhere it was used in places as low as 3½ ft. R. N. Hosler said that four out of five electrical accidents came from the use of 500-volt circuits. He considered that this was sufficient evidence of their dangerous quality. William George, Madeira Hill Coal Mining Co., said that while a shock from a 250-volt current tends to knock one away from the circuit, a 500-volt circuit tends to hold you to it.

R. C. Beerbower said that on the opening of the Springdale mine there had been much discussion in his company as to the better voltage to use—250 or 500. As a result it was decided to use 250, the mining men vigorously protesting against the arguments of the electric power plant experts who favored 500 volts. He felt that it was the economical voltage because the ma-

chinery was more readily maintained in condition. Joseph Knapper said he had no more accidents where 500-volt circuits were established than where the voltage was 250. The men apparently had become educated to take no chances with such deadly current. Nevertheless he was opposed to so high a voltage. W. H. Howarth said that as the lower tension was likely to be made legal it was risky financially to install a higher tension.

At the afternoon session Alexander McCanch, state mine inspector at Monongahela, Pa., gave well-considered views of "Mine Accidents and Their Prevention." In commenting on Mr. McCanch's paper, F. B. Dunbar, general superintendent, Hillman Coal & Coke Co., said there always should be clearance on both sides of a mine



Nicholas Evans

For many years state mine inspector of Johnstown, Pa. Elected president, Coal Mining Institute of America for 1925. Mr. Evans has for many years been a member of the Coal Mining Institute of America and a regular attendant.

track—a wide or working clearance on one side and a man-clearance on the other. He said also that firebosses should be encouraged to report gas. Twenty years ago a fireboss would be discharged in some mines if he reported gas twice in the same section. It was an attitude like that which caused the fireboss to fail to report gas and this, in those days, was a cause of many accidents.

R. N. Hosler said that one-third of the men killed in haulage accidents were not employed in haulage, showing the need for separate travelingways for mine workers or for the introduction of the man-trip. Francis Feehan declared that the mine workers were quite frequently sent into the mines without being directed as to safety practices and without having it clearly understood that safe conduct at the mines was a condition of employment. He believed that men should be disciplined for infractions of the mine rules.

C. L. Lutton, of the H. C. Frick Coke Co., in reply to Mr. Feehan said that a colored man related at a safety meeting that he hadn't learned much about mining, but this he had learned that he must block his cars. He had lost a week on suspension, and the idea was clearly borne in on him that it was an excellent thing to do if one desired to hold one's job with the H. C. Frick Coke Co. George Steinheiser, general



superintendent, Jefferson & Clearfield Coal & Iron Co., believed that prosecution was the better way to enforce safety and asked, "Can you prosecute a man for disobeying safety provisions when the violation of the rules does not produce an accident?"

Mr. McCanch declared that a man could be prosecuted for a violation of the mining law but not for failure to comply with the orders of the foreman if those orders required him to do something that would promote safety but which was not a legal requirement. Thus the track in his room might be in such condition as to be likely to cause an accident. The foreman might order him to repair or relay the track. That was a proper order, but compliance with it was not required for the miner under any provision of the law. The foreman could discharge the man for failure to comply with the order, but he could not prosecute him, no matter how much his negligence might menace life or limb.

Mr. Steinheiser replied that he questioned whether the foreman could prosecute a man for failing to set a prop on being ordered to do so. Mr. McCanch said he had obtained the conviction of a man for that act of negligence, but it was necessary to show the court that the condition of the roof made the standing of a prop necessary for safety. John I. Pratt said that he knew of an instance where a foreman had ordered a man to stand a prop. When the man failed to do as directed, the foreman ordered the man to leave the room, and he then put a danger signal near the room mouth. He prosecuted the man for the act of disobedience, and the court found as requested, fining the man \$100.

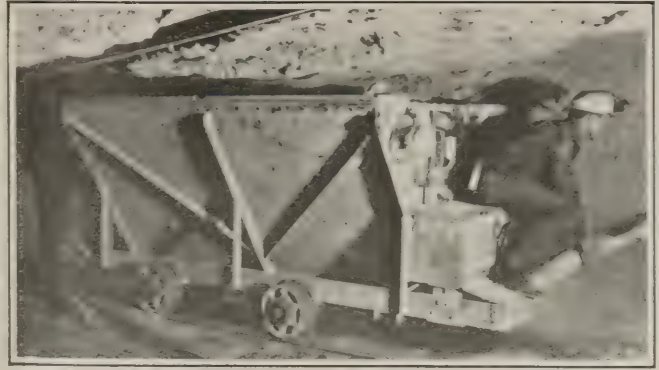
#### SUSPENSION MORE EFFECTIVE

W. G. Duncan declared that in a number of cases it had not been necessary in obtaining conviction to show that an accident had occurred. You cannot, he said, derive the whole law from any one paragraph. There are some unsafe practices for which a man can be prosecuted with or without an accident and others for which a man can be prosecuted only if an injury follows. A. C. Callen said that for some violations of the orders of a mine foreman mine workers cannot be convicted, and it is questionable whether they can be sentenced for not setting a post when ordered, if the roof is strong and sound. But "Why," said he, "prosecute a mine worker when suspension gets quicker results?"

H. E. Kinlock questioned the advantage of having miners set timber. He had gone to work in the mines in 1871, and in the mine in which he was employed, even in that early day, timbermen set all posts. Joseph Knapper said that the Secretary of Mines had this year pitted the anthracite mines against the bituminous mines in a contest for safety. The anthracite mines usually have one-fifth more fatalities per thousand men employed than bituminous mines. This year the latter, though they had worked irregularly, had experienced more fatalities per thousand than those in the anthracite region.

Dr. R. R. Sayers then delivered an address on "Health Hazards in the Mining Industry," describing the effects of high temperatures and humidities, of dusts, of oxygen depletion, of carbon dioxide, hydrogen sulphide, sulphur dioxide and carbon monoxide. He discussed also the methods employed underground for disposing of sewage and providing drinking water, the value of illumination and the diseases known as nystagmus, beat hand, beat knee and beat elbow.

He described, though his paper does not report it, the sanitary conditions inside and outside the mines



Fear Rock-Dust Distributor in Operation

This type has been developed for use in thick seams. It has a carrying capacity of 3 tons of rock dust and with two men will lay a uniform coat of dust over one mile of entry in a shift of 8 hours. This photograph was taken in the No. 8 mine of the Pittsburgh Terminal Coal Co.

the experiments made on animals by injecting dusts in the abdomen, thus creating in the subject tissue changes probably similar in all respects to those created in the lungs by inhaling dust. The action is more rapid, however, and these inquiries seem to indicate that dust of many, if not of all kinds if introduced in quantity has its harmful effect. Dust is like poisonous gas. The human organism can resist even the most poisonous of gases if presented in sufficiently diluted form, but succumbs readily to a dose of greater concentration. He said that Dr. Mavrogordato has concluded that "it is the dust that cannot escape from the tissues which is a source of danger and as long as elimination follows fairly closely upon the heels of ingestion not much harm is done. Coal seems to set up a sort of aseptic 'catarrh' in which there is a steady exodus of particles from the lungs." In reply to N. D. Hubbell, Dr. Sayers said that amorphous silica, such as kaolin, like crystalline silica, was harmful, at least when injected into the abdomen.

In response to an inquiry as to whether nystagmus might be a germ or worm disease transmitted in warm mines he said that men in clerical work with poor illumination often suffered from nystagmus which passed away when the working light was bettered. Some have thought, however, that nystagmus might be caused by gases. The victim of nystagmus at first carried, in the eye, images of things he had previously seen—after images—and later had oscillations of the eyeball, vertical or horizontal, usually the former.

#### COAL DUST CURED TUBERCULOSIS

Nicholas Evans said he questioned whether coal dust could be harmful to the human organism. He knew of a tubercular man who went to work at a coal dump to get his fill of coal dust; in consequence his tuberculosis was cured.

Dr. Sayers said that he thought that the claim that the presence of coal dust enabled the lungs to throw off dust cells was rather far fetched. It had, nevertheless, its advocates. Asked by J. F. Downs whether a man whose heart missed beats while working in a place where carbon dioxide was present in excess of the normal quantity, could ascribe the condition fairly to the presence of that gas, Dr. Sayers said that with such quantities as were likely to occur such an effect on the heart would be unlikely. He would want to know what the man was doing in the off-shift hours.

Questions Nos. 3 and 4 were combined to read "Are



much improved over thirty years ago? If so, what are the main reasons?" Dr. Sayers said that there was no doubt that conditions are now more favorable. Better air and water were provided. J. J. Rutledge said that the air had greatly improved since the time when it was said that the way to make an old man out of a young one was to put him at work driving entry. He thought all mines needed the man trip and the change house. However, to H. E. Kinlock, who in 1871 went to work in a mine where brattices were kept within 4 ft. of the face and where all the shooting was done at night, it appeared that conditions were worse than in years past.

In response to an inquiry, Dr. Sayers declared that burned-out carbide residue did no harm. Some silicon hydride might be emitted and this gas was dangerous like hydrogen sulphide, but occurring in small quantities it did no harm.

At the banquet, with M. D. Cooper presiding, the Rev. Dr. Frederick G. Budlong made an address on "Leadership"; Thomas S. Baker, president of the Carnegie Institute of Technology, one on "Engineering Education" and H. L. Cope a humorous address on the philosophy of laughter. Dr. Baker said that the large consolidations in industry restricted the number of places open for college graduates, but also made the few places available of more value for those who obtained them. He also said that the many specialties developing tempted the colleges to go too far into specialized education. He added that it seemed likely that, in order to give a student the material needed for meeting the problems of operation, the courses might have to be lengthened.

#### BELT CONVEYOR 4½ MILES LONG

At the morning session of Thursday, Ralph Beerbower, general manager, Pittsburgh-Allegheny Coal Co., presided, the session opening with an address by Thomas C. Dawson, chief engineer, H. C. Frick Coke Co., on "Underground Belt Transportation of Coal." In this address Mr. Dawson described the 4½-mile belt conveyor of the H. C. Frick Coke Co. at Colonial mines, which was to be visited the following morning. Mr. Dawson also showed moving pictures of the installation.

M. A. Kendall, chief engineer, Stephens-Adamson Manufacturing Co., read a paper on the same subject, giving details regarding the four belts of the Hardy Coal Co., at Panther, W. Va. He remarked that though the longest belt at the H. C. Frick Coke Co.'s installation was 1,513 ft. long his company was of the opinion that the distance between centers could be economically and safely extended to 2,500 or even 3,000 ft. The tensile strength of the belt at the Frick plant was 10 to 12 times the working strength. The energy consumed was 0.1 kw.-hr. per ton-mile on the level. There was practically no dust, though to obtain that condition the coal was watered at the face.

E. C. Auld, the mechanical engineer of the H. C. Frick

Coke Co., discussed the plant and said that there was practically no disintegration of the coal. W. L. Affelder wanted to know if the product had not deteriorated as a result of the use of the long rotary dump which made inspection of each individual mine-car load of coal practically impossible. Mr. Auld said that the Clairton furnace had made no complaint of that sort.

Means are afforded for slowing down the dumping of coal, so that it can be inspected as it is being discharged. Tracks are provided by which a full trip can be set aside for that purpose. This trip can be dumped slowly and the coal watched as it leaves the cars. Should the coal from any section of the mine be suspected of having an abnormal percentage of ash, it can be side-tracked and examined at leisure.

In reply to M. D. Cooper, Mr. Auld stated that the accident rate had not increased as a result of the installation of the belts. Inquiry developed from Mr. Auld that no accidents had occurred in the operation of the belts, but that their installation had not reduced accidents because the coal prior to the operation of the belts traveled as far as it does now.

The coal formerly was not carried to the river but was discharged and used at points four miles or more from the docks. The system, however, increased the safety, as the cars were not uncoupled before dumping and did not have to be recoupled thereafter. No accidents had occurred while the idlers were being removed from under the moving belt for repairs. T. W. Dawson said that 1,000,000 tons had passed over the belt since its installation April 1.

#### NO COAL BROKEN ON CHUTES

In answer to an inquiry, Mr. Auld said no careful examination had been made, but he believed that no coal was broken in sliding on the chutes from one belt to the next in line. Some breakage occurred in falling into the bins and again in loading the coal into barges from the pockets at the docks. At the feeders, the coal falls on coal, the layer of coal being built up as the belt under the feeders progresses along the dump.

In answer to Question No. 6, "Is Underground Mechanical Loading a Success?" R. R. Dunlop read the paper of N. D. Levin, chief engineer, Jeffrey Manufacturing Co., on the new loading and belt conveyor methods of his company. He said he had in mind developments of this kind for twenty years, but felt sure they were foredoomed to failure so long as operators insisted on maintaining their present room-and-pillar methods. Now that the longwall system is receiving tardy recognition his company is preparing to supply the necessary machinery.

His view was that the machines for loading should not be moved from place to place several times in a single shift; in fact he declared that the machine should remain in a single place, shift after shift, till the place was worked out. Mr. Levin said that the New



River Co. at its Cranberry mines with head offices at McDonald, W. Va., had a shortwall conveyor with a sectional conveyor at work and also a shortwall loader with sectional conveyor. Five blocks, 100 ft. wide by 100 ft. long, had been removed already.

He did not know, as yet, whether it would be found that the two upper cutterbars broke the coal to such a degree as to increase the percentage of fine coal. He thought not. The speed of the upper cutterbars was slow. With this device the coal could be shot lightly, far lighter than with other methods of loading. The machine could load coal even when the seam had been shot so lightly as just to shake or crack it without, however, bringing any coal to the floor.

Mr. Maize, state mine inspector, said that the main difficulty of the inspectors was to keep loading machines out of the mines. Operators inform them that they are going to put loaders to work and inquiry develops that the operator has not troubled to ask whether the loaders are flameproof. He wondered that the manufacturers of loading machines overlooked the importance of fitting them for use in gaseous mines. Mr. Levin said the motor on the 44-A loader had been approved by the Bureau of Mines. No official approval had yet been accorded the other loader, but they expected to receive it soon.

E. H. Coxe, general manager, Snowden Coke Co., said that he had been trying to work his coal by longwall. The main roof could be held satisfactorily, but the drawslate was giving much trouble. He could not hold the roof for a distance of more than 4 ft. from the face. He could make his 6½-ft. undercut, but the roof had to be posted as soon as the cut had been made.

#### MOVIES SHOW DUSTING METHODS IN WEST

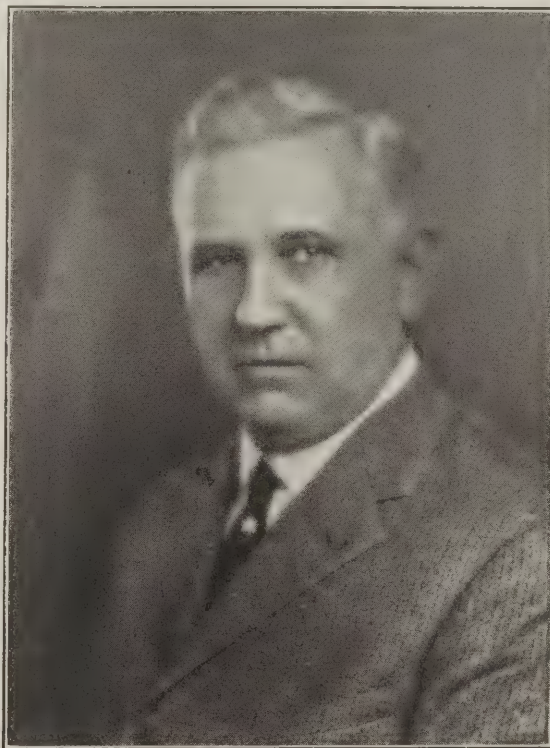
At the afternoon session, over which R. N. Hosler presided, Edward Steidle, supervisor, co-operative courses, Carnegie Institute of Technology, read his paper on "Modern Methods of Rock Dusting in Coal Mines," the first part of which is published in this issue. H. I. Smith said that rock dusting was advocated by George S. Rice a third of a century ago. Mr. Rice told an operator in Illinois that explosions had been found to terminate in places where there was a large quantity of shale dust, and that he thought the artificial spreading of such dust would act as the natural dust had done. Later the Rainey mines had been dusted and one of the mines of the Pittsburgh Coal Co. Mr. Smith showed motion pictures of a trip he had taken with J. E. Jones through the West. They found that the Western mines had actively entered the rock-dusting campaign and devised several dusting machines for use in their entries.

J. T. Ryan also showed several pictures of the Bureau of Mines' barriers, the Fear rock-dusting cars and the Indianola mine. Mr. Fear said that the cost of rock dusting at his mine during the month of May was 7 mills per ton. He expected it would be less hereafter. His final machine had a large dusting capacity, but in practice, as there were delays, it would be likely not to average over 4,000 lineal feet a day.

He found that the finer dusts did not stick on the sides of the roadway not having, he believed, sufficient inertia, so he was going to use dust that was somewhat coarser. Dr. W. J. McConnell, of the Bureau of Mines, replying to Question 8, said that limestone was the preferable material for rock dusting because of its light color, its freedom from combustible and its probable

physiologic harmlessness. Shales contained usually from 2 to 20 per cent of combustible matter.

J. M. Armstrong, general manager, Pittsburgh Coal Co., said that rock dusting had cost them 2½c. per ton of coal mined but that he hoped the cost might be reduced to 1c. He doubted if the Pittsburgh Coal Co. would be able to reduce the cost below that figure. Mr. Dunbar, general superintendent, Hillman Coal & Coke Co., said that his company had dusted about 60,000 ft. of entry. It was using barriers where there was no road. He had never thought much of water sprinkling. Most managers did just enough to "get by the inspector." He believed that rock dust would not



**J. M. Armstrong**

General manager, Pittsburgh Coal Co., elected first vice-president Coal Mining Institute of America for 1925. Mr. Armstrong's efforts this year brought 161 new members to the institute.

only protect the mine against explosions but also against the slabbing of the pillars along the roadway.

A. C. Fieldner described the volumeter. Coal dust has a specific gravity of 1.3 and rock dust, whether limestone or shale, a specific gravity of 2.6 approximately. Twenty grams of collected dust are put in a receptacle and to it are added 50 c.c. of liquid. The level of the liquid is then read. Some kind of alcohol is used because alcohol will wet coal dust whereas water will not. Thus the dust will fail to receive the water into its interstices. If there is much coal in the dust a greater volume of dust would have to be used to provide the required weight (20g.) and the liquid will rise to a higher level in the volumeter. This method of determining the inertness of rock dust was suggested by M. Taffanel, the French mining expert.

Samples of dust from all over the country had been tested by this and by combustion methods, and no differences exceeding 5 per cent had been found in the indications by the two methods. In burning dusts if limestone is present not only will the combustible be burned away, but the limestone will be decomposed, giving excessive indications of "combustible." Conse-



quently, without great care to correct for this decomposition, the combustion method will give errors larger than those given by the volumeter method. Mr. Fieldner added that in France a method of measuring the inertness of mixed dust by the length of the flame produced in its combustion was practiced. He found it difficult to ascertain the length of the flame and, though he believed the ability to do so could be acquired, it would take long training and even then the method would be inexact and somewhat fortuitous.

Mr. Steidle said that he could not grant that there was any danger to health to be anticipated from the use of dust containing 35 per cent of free silica. Such dust had been used in Great Britain for years without unfavorable results. In Illinois dust of that character had been employed for three years.

Mr. Rice referred to the discovery, by Mr. Atkinson in England, that the presence of disintegrated rock dampened the violence of explosions, to the rock dusting work of Dr. Garforth at Alltofts and to the erection by that mine manager of a short dust gallery for experiments. He said that when he was traveling the mines of Great Britain he had never seen the dust rise in a cloud from the roadway except when a horse was hauling cars along the road. Then the dust would rise knee high, but above that the air was clear.

#### BARRIERS STILL GOOD AFTER A YEAR

Dusts from all over the country had been sent to the Bureau for test. Some were extremely bad, especially flue dust, which the Bureau had condemned. Despite all that had been said as to the packing of ground rock in the presence of moisture, the rock dust in the barriers at the experimental mine had remained in good condition for a year at a time, showing that some dusts at least did not harden in a short time and become valueless. About 90 per cent of the time the barriers proved effective but in 10 per cent of the cases they failed. Perhaps he might be pardoned in speaking about the Dawson explosion that occurred many years back. At that operation were two distinct mines connected by a passageway. The explosion in one mine communicated to the other, and a large number of men were killed in the second mine. A rock-dust barrier probably would have prevented the passage of the explosion from one mine to the other. Mr. Rice added that before he went to France on his recent trip an operator called him in consultation and told him he wanted to get the latest information on rock dusting. This operator said sprinkling was costing him 25c. a ton and that he had ordered the management, nevertheless, to spare no expense, but he wanted a cheaper and more assured way of obtaining safety. He is now using rock dust.

Mr. Enzian said several companies in central Pennsylvania were getting ready to rock dust. Others said that rock dusting was either being introduced or had been introduced at Wehrum, Robindale and Nantygly.

In discussing Question No. 9 as to "The most effective way of minimizing the present appalling rate of fatalities due to falls," Mr. McCanch said that overdevelopment of mines should be avoided because when roadways were allowed to stand the rock became loose and was likely to fall. Of course, it was necessary in places when the measures were uncertain to keep the development well in advance, lest at any time it might be found that a certain area would yield no tonnage and consequently that provisions should have been made to open up an entirely different area.

On Friday at least two inspection trips were made, one to Colonial docks and the other to Indianola. The visitors to the former inspected the dump and then were taken in cars along the belt-conveyor line to the rotary dump where the first belt is loaded with coal from the mine cars, thirty-five to forty cars being dumped at one time. As Mr. Dawson described the plant quite completely in his paper it is not necessary to discuss it at length. It might be well to emphasize the freedom from dust throughout the operation.

In many places the old Alice mine, used as the approach to the Colonial mine, had caved to considerable heights, and it had been necessary to build arches over the entry. Large quantities of concrete, steel posts and steel beams have been used to protect the roadway, which in the Alice mine is 14 ft. wide. The coal is taken by the belts to a bin under which move two shuttle conveyors. Each conveyor can handle 1,000 tons per hour. They move backwards and forwards so that the point of discharge is varied. Each storage bin has a capacity of 1,200 tons. Barges, 26 ft. wide by 175 ft. long and carrying 850 tons are loaded by eight chutes and can be filled in ten minutes. All gates, chutes and the barge-mover are controlled from the operator's room under the bins. Lunch was served to the visitors by the H. C. Frick Coke Co., in the supply house of the mine.

R. C. Beerbower supervised the trip to the Indianola mine which was accomplished in automobiles. The Westinghouse Electric and Manufacturing Co. prepared an interesting exhibit at East Pittsburgh, showing a new permissible mining machine, a new arc-welding rheostat, a 200-amp. arc welder, clutch-type synchronous motors, a pneumatic hoist control, die-cast aluminum rotors for squirrel-cage motors, sealed sleeve bearing for motors and other interesting exhibits.

#### Crush Their Own Stone at Paintsville, Ky.

Many coal mines produce a good grade of sand rock which can be broken up advantageously for tramroad and railroad ballast, for concrete and for village road improvements. At Thealka, Ky., the North East Coal Co. has erected a bin and purchased a stone crusher and elevator for the preparation and storing of stone to be used in their concrete construction work. This is located at the foot of the slate pile, the sand rock being slid down the face of the dump by means of a rudimentary chute.



Stone Crusher at Paintsville, Ky.

A portable crusher, an elevator and a roofed bin form a suitable plant for the crushing of sand rock and its storage preparatory to use for concreting. The North East Coal Co. has found this rough equipment of great use in reducing its concreting costs. much concrete work being used in the mines and around them.

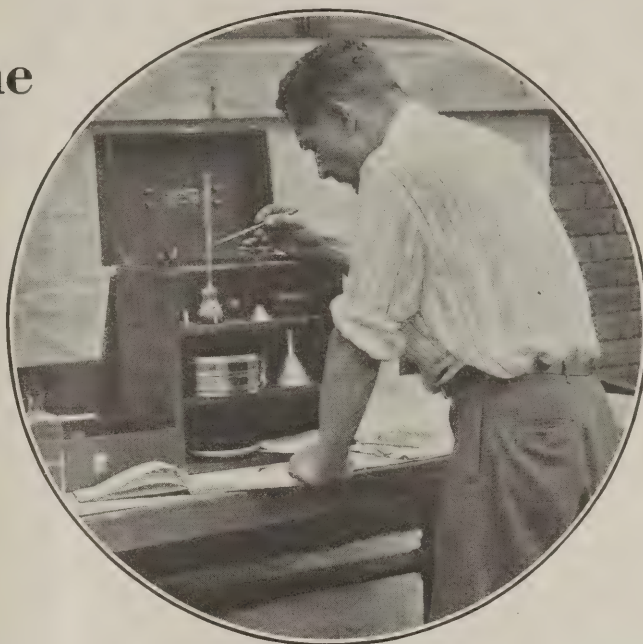


# How Rock Dust Cures the Epidemic of Mine Explosions

Explosions' Fatalities Rise in 1924 to 25 per Cent of All Fatal Accidents in Mines—One Hundred Companies or More Are Now Rock Dusting—Some Rock Dust on All Roadways, Ribs, Roof and Timbers

BY EDWARD STEIDLE

Superintendent Co-operative Mining Course,  
Carnegie Institute of Technology,  
Pittsburgh, Pa.



AMERICA has experienced its full share of bituminous coal-mine explosions. The first on record in this country occurred on March 18, 1839, in the Black Heath mine near Richmond, Virginia, and resulted in 40 fatalities. Up to Nov. 1, 1924, according to reliable data, there have been 263 explosions in the bituminous mines of the United States, killing five or more men each, or a total of 7,735. The largest disaster took a toll of 361 lives.

Beginning with 1910 and ending with Dec. 4, 1924, there have been 58 explosions in which coal dust is known to have played an important part, with a total loss of 2,422 lives, to say nothing of millions of dollars in property. It is estimated that about 75 per cent of the lives lost in coal dust explosions could have been saved if the mines in which the explosions occurred had been systematically rock dusted.

It must be remembered too, that the majority of mine explosions occur when relatively few men are in the mine. In so far as the time element is concerned, the two high peaks for explosions are at 7:30 a.m. and 6 p.m.; the former is due in large measure to poor fire-bossing, or open lights (which means gas) and the latter to shotfiring (which means explosives and dust).

## EXPLOSION HAZARD MAGNIFIED

The figures mentioned look big, but it is true that normally, on a percentage basis, the explosion hazard is of minor importance. Over a period of 10 years from 1911 to 1920, inclusive, only about 12.21 per cent of the total number of fatalities in the bituminous coal mines was due to explosions and fires, whereas 41.19 per cent was due to falls of roof and coal. From another angle it might be added that the average number of men killed per 1,000 full-year (300-day) workers during this same 10-year period is less than 5, which means about 0.6 killed by explosion and fires per 1,000 full-year workers. On a million-ton basis this figure

would be even less. Therefore, the glaring headlines in the press, following a mine explosion are uncalled for and mislead the public, which can do little to remedy the evil, but is only too free to criticize.

However, if we consider the explosion record since 1920 we can readily appreciate why mine owners, mine workers, and the public are deeply concerned in the matter. Five explosions occurred during 1920 with an average of seven fatalities per explosion, eight explosions with an average of four deaths in 1921, seventeen explosions with an average of sixteen deaths in 1922, seventeen explosions and an average of twenty deaths in 1923, and eight explosions resulting in a total of 452 fatalities in 1924, up to and including Oct. 1. The percentage of the total number of fatalities due to explosions and fires has already jumped up from 12.21 to about 25 per cent in 1924. This is the tragic story of the past four years, and the cause for the feeling of alarm among our responsible coal mining men, who can and will improve these conditions.

## COMPARATIVE COST NEGLIGIBLE

Several of our leading mining men who have had experience in rock dusting believe that on a long-term basis the cost of applying rock dust will not exceed a quarter of a cent per ton of coal mined but obviously this figure has not been substantiated. In any event the cost should not exceed 1 cent per ton. However, any reasonable expense is an almost negligible item as compared with the loss of life and property. The cost to the public of widespread coal dust explosions is many times greater than the cost of preventing these explosions by rock dusting. The Castlegate and Benwood explosions are reported to have cost no less than \$2,000,000 in compensation, property damage, and recovery costs.

If 500,000,000 tons of bituminous coal are produced in 1924, this loss represents an added cost of 0.4c. per ton that in the last analysis must be paid by the consumer. In other words, the money lost by these two widespread explosions, which could have been prevented by systematic application of rock dust, would possibly have

NOTE—First part of paper entitled "Methods of Rock Dusting Bituminous Mines," read before the Coal Mining Institute of America, Pittsburgh, Pa., Dec. 4. Headpiece shows safety inspector ascertaining the percentage of inert material in the dust from the mine.



rock dusted all the dry and dusty bituminous coal mines of the United States without increasing the total cost of coal for the year.

Bituminous coal mining operators do not knowingly and willingly allow potential explosion conditions to exist in their mines. Operators and officials are just as humane as mine workers and always guard against the horrors of an explosion. Yet the record just given is circumstantial evidence that there are evils of omission or commission, or both, on the part of someone. By an act of Congress, approved May 16, 1910, and effective July 1, 1910, a Bureau of Mines was established in the Department of the Interior. At first the Bureau, under the terms of the act, gave attention chiefly to investigation of causes of, and remedies for, accidents, especially coal mine explosions. With a view, therefore, of eliminating explosions from the miner's life and from a critical public, the characteristics of gas and coal dust explosions have been studied diligently by the Bureau since 1910. The scientific facts so ably established by the Bureau are sufficiently extensive to justify the expectation of a better history than the record shows. The Bureau has of course no mandatory power and does not wish to obtain it.

However, at least ten years ago, the Bureau recommended rock dusting among other things as a means of preventing and limiting mine explosions. Only five operators adopted the system in America up to 1924. Therefore, some mining men were either not fully informed regarding these preventive measures or did not give them proper weight in the conduct of their business. In due fairness it should be stated, however, that a few of our more serious explosions have occurred in mines where nearly every practical and physical precaution had been taken, only to be nullified by a false step on the part of some employee or by defective equipment.

#### WATERING METHOD COSTLY

Coal dust can be made harmless if it is wetted so that it cannot be thrown into suspension. Watering is the method which has been most commonly used, and to a limited extent successfully, but it is costly, deceptive and usually gives a false sense of security. For some years during the early days of the Bureau of Mines, humidification of mine air was considered to be the panacea for widespread explosions, in that it would allay the dust, but tests conducted by bureau engineers showed that humidification was not a satisfactory remedy. In our present enthusiasm over the use of rock dust, the good work that various mining companies throughout the country have done in wetting down coal dust and in humidifying mine air should not be overlooked. But at a number of mines where water was used consistently, violent and widespread explosions have occurred.

Up to June 17, 1924, only five companies were rock

dusting in America. But this safety measure has received a great impetus during the past six months. At least one hundred mining companies have adopted rock dusting in various parts of the country, and it is being taken up much faster than anyone anticipated. However, as usual among coal mining men, it is being done quietly and with due deliberation. One large company in the Pittsburgh district is systematically rock dusting eight of its mines, but no publicity whatsoever has been given to the matter. Mine operators are in earnest regarding the rock dusting of their mines, and the "boom" will naturally extend over the next two or three years.

In this connection the Carnegie Institute of Technology, in co-operation with the Bureau of Mines and the Advisory Board of Mine Operators and Engineers in western Pennsylvania, is carrying on fellowship researches relative to rock dusting during the present college year. It is endeavoring to devise a more satisfactory method of quantitative analysis for free silica, using microscopic means and to determine which rock formations associated with the coal measures in western Pennsylvania are suitable for rock dusting. It will collect data relating to costs, equipment, and systematic methods of treatment, particularly regarding the Pittsburgh Terminal No. 8 mine which is being rock dusted in an

up-to-date manner, and where accurate and detailed costs are being kept. A bulletin covering the results of these investigations will be ready for distribution in the early fall of 1925.

During the past ten months much has been said and written regarding rock dusting. In this period we have had considerable experience and, as usual, many of our theories have necessarily given way to practical considerations. We are just beginning to get at the bottom of the practical application of rock dusting, and one of the first conclusions is that rock dusting is truly an engineering problem. Sooner or later the Bureau of Mines will have to prepare a schedule of tests for rock dusting equipment. My endeavor in this paper is simply to point out some of the more practical phases and modern developments relative to this means of explosion prevention.

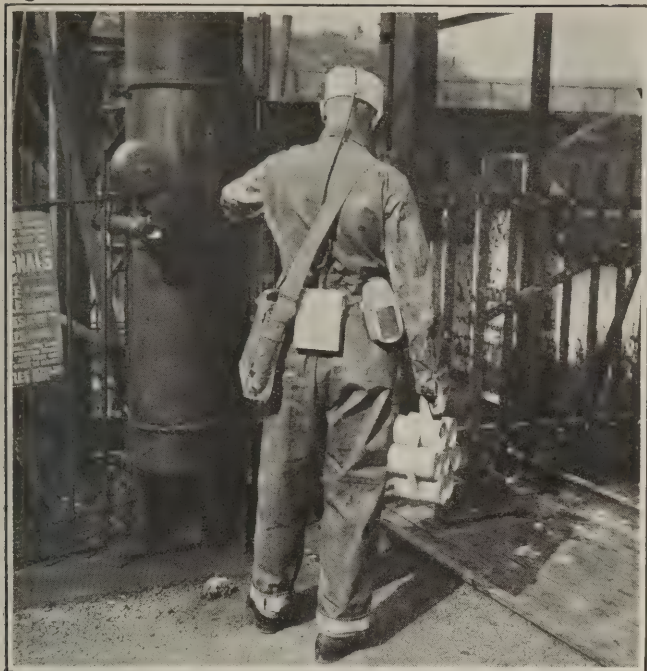
#### SAVES INSURANCE COMPENSATION

In June, 1924, the Coal Mine Section, Pennsylvania Compensation Rating and Inspection Bureau, revised Item 85 of its Rating Schedule so that a charge of 5c. is made for a dry and dusty mine, and at the same time a credit of 10c. is given where the mine is rock dusted. In other words, a properly rock dusted mine in Pennsylvania will save 15c. per \$100 of payroll in its compensation insurance. It might be added that Illinois, Indiana, Iowa, and Michigan allow a credit of 10c. for rock dusting. Kansas and Montana give a credit of 13c., and Utah a credit of 14c., while New Mexico, Ala-

### ALREADY ROCK DUSTED BUT INSUFFICIENTLY

**E**XAMINATION has shown that in an undusted mine the road dust is as an average 43.5 per cent inert, ranging between 27.2 and 54.6 per cent. The dust on the rib, roof and timbers averages 30.8 per cent inert with a range between 20.7 and 50.1 per cent. Thus all roadways are rock-dusted in a degree, but dust explosions show how greatly that natural treatment fails to be adequate. Still, we may be encouraged by the fact that some of the needed work is done automatically, and our work is merely supplemental to what is already done. Physiologically also we are gratified to learn that we are not adding 50 or 60 per cent of dust but a much smaller quantity to what we already have on the roadway.





**Safety Inspector Waiting to Descend Shaft**

He has hanging from a strap in his right hand a number of cartons for holding his dust samples. He carries also his lamp, battery and the means for sampling the dust. No elaborate outfit is required.

bama, Colorado, and Oklahoma head the list with a credit of 20c.

One steps into deep water when one discusses legislative matters. However, it is desirable to mention at this time the attention being given by various states to rock dusting and other preventive measures. A number of states propose a revision of their mining laws with regard to the coal dust hazard and rock dusting. During the last session of Congress, Representative John N. Robison, Chairman of the House Committee on Mines and Mining, suggested in a speech before the House of Representatives that the President should call a conference of Governors of coal producing states for the purpose of considering joint uniform action relative to safety measures in mines, including rock dusting.

Recent drastic Federal and State regulations approved by mine operators made rock dusting compulsory in the bituminous coal mines of Utah, beginning July 1, 1924. Legislative action favorable to rock dusting may be expected, furthermore, in other states. Colorado has already proposed legislative action, and Pennsylvania, Maryland, Washington, and West Virginia are now giving the matter due consideration. If we are to have new legislation it is, of course, essential that the various states know what they are about and then, if possible, work for uniform regulation.

Some mining men believe that we have too many mining laws, and that some of them need to be removed from the statute books and better ones standardized and substituted. Other men feel that supplementing statute laws with regulation, as is done in Maryland, Wisconsin, California and Utah, is the best way to cover these matters. Some men say that we have sufficient law, if it is enforced, and we need to put some regulation into effect. If the rock dusting problem is handled properly and it proves to be entirely successful, no mining man of any standing will delay its use in his mine. State legislation regarding this matter may or may not solve the problem. In other words, every

mine in the State of Utah is being rock dusted, and though some are doing it conscientiously, with intent to get what good can be obtained, others are reported to be doing it only to keep within state regulation.

It has been proved conclusively that if pure, fine, dry coal dust is raised into a cloud in the presence of a source of heat—for example, a blownout shot, an ignition of gas, or an electric arc—combustion takes place between the carbon and hydrogen of the dust and the oxygen of the air. This reaction may continue, and the flame travels or propagates through the dust cloud with rising temperature and increasing velocity and violence. One outstanding feature is the fact that bituminous coal dust is flammable in pure air. The presence of an explosive gas may aid, but is in no way required for a coal dust explosion. Explosions are sure to occur when there is a proper combination of conditions, and it is well understood that the season from, say, August to March, is always far more prolific of dust explosions than the remainder of the year.

When not less than a 50-50 mixture of rock dust and coal dust is thrown into suspension, the rock dust, together with the coal dust, absorbs heat and lowers the temperature of the flame of propagation below the ignition temperature of the coal dust. Also the particles of rock dust get between the particles of coal dust and have a curtain-like effect. One of the most reasonable merits of rock dusting is the fact that once the dust is distributed systematically throughout a mine, it remains there indefinitely and is always "on guard" during the dangerous period of the year.

It should, of course, be definitely understood that rock dusting is only an additional precaution, and is not expected to take the place of any existing practice of keeping the mine well ventilated and as clean of coal dust as is possible. In other words, mining men will not tie absolutely to rock dusting. It is entirely satisfactory for haulage entries and entry aircourses, but it may be desirable to "kill" the coal dust as it is in process of formation, or immediately afterwards and particularly in dry and dusty mines.

#### WATER USED AT WORKING FACES

The way some companies are doing this is by using water and plenty of it, at and near the working faces; for example, on machine cutter bars while undercutting, in the immediate vicinity of the face before blasting, and on the broken coal before and while shoveling. On the other hand some mining men believe that watering at the face is of no consequence as well as impracticable, and that sprinkling merely agitates the dry, fine dust. Others state that analysis records of samples taken before and several months after washing down the gob, indicate that the dry, fine dust before washing actually contained a greater amount of incombustible.

The production and accumulation of fine dust also can be eliminated in a large measure at the working face by driving all workings on sight, so that a minimum number of bumps will be left to be pick-mined; by more careful handling of bug dust; by loading out all bug dust in the beds of cars; and by more efficient use of explosives. On haulage roads the production of fine dust can be reduced by using tight-fitting and solid-body cars; by employing stiff hitchings; and by providing a well constructed track.

Some companies sprinkle loaded cars after they are loaded and before they leave the face, and also spray them as trips are leaving inside switches or partings.



The cost of drastic safety measures seems, on first thought, to be prohibitive, but our mines should be made safe, and any expense in this connection logically can be charged to the consuming public.

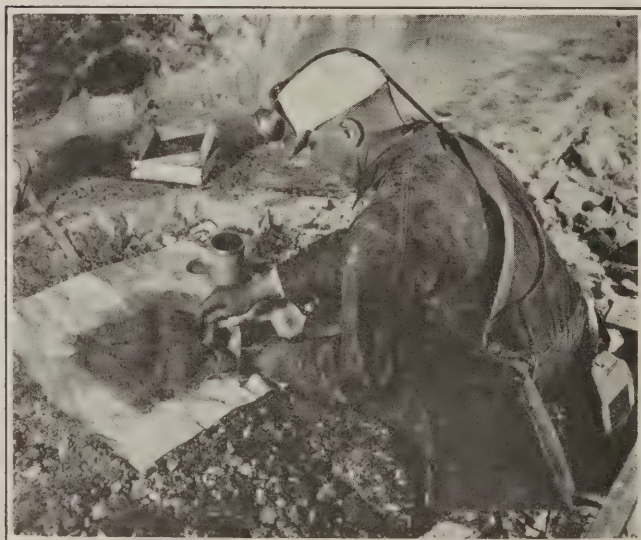
Coal mining men are now thoroughly convinced of the value of two safety measures—namely, the use of permissible explosives and of electric cap lamps. However, only 33 per cent of the coal mined in 1923 when bituminous production was 545,000,000 tons, was shot by permissible explosives. The number of electric cap lamps in use at the present time is estimated at something over 200,000, and is growing. Rock dusting and these other safety measures are important indeed, but it must not be overlooked that most mine explosions have had their beginning in gas accumulations and frequently originated in restricted areas at the working face, in abandoned areas or at some other place where ventilation is not maintained as it should be.

There must not be too much "rule-of-thumb" relative to the volume of air required and constantly furnished at a given working face or in a given entry panel or other area. The question uppermost in mind is whether a sufficient quantity of pure air reaches every portion of the mine, brushes all fresh working faces, and the shifting top in pillar-drawing areas. An accurate ventilating map and definite records of air at the face must be kept as well as barometric observations. It must be remembered also, that for each 1 per cent of methane in the mine air an increase in quantity of rock dust of 5 per cent will be required.

The Bureau of Mines seems to have established the fact that coal dust is flammable in proportion to its fineness and dryness, and to the proportion that the ratio:

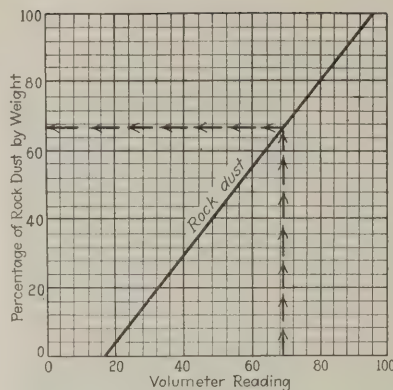
$$\frac{\text{Volatile matter}}{\text{Fixed carbon} + \text{Volatile matter}}$$

This ratio indicates that anthracite dust is practically non-explosive, that fine dry bituminous and lignitic dusts are highly flammable, and that dust of such a hydrocarbon solid as gilsonite is almost as explosive as gunpowder. Furthermore, it is established that bituminous dust which is larger than 20-mesh will scarcely enter into an explosion. One which is about 100-mesh is dangerous, especially if dry, and one which passes



Quartering the Dust for a Sample

As the quantity of dust removed from the floor or ribs and roof at any one point along an entry is greater than necessary for the actual determination of its contents, the dust is screened, mixed and divided into four parts and from each division is taken a few ounces to comprise the sample proper which weighs about  $\frac{1}{2}$  lb.



Volumeter Chart

The volumeter does not give the percentage of rock dust direct but it can be determined by the use of this chart.

through a 200-mesh sieve and is dry must be classed as exceedingly flammable. If, however, these coal dusts do not contain more than 45 per cent combustible matter, they are not likely to cause an explosion unless there is also 1 per cent or more of methane present in the air.

An examination for the coal dust hazard, by a competent safety engineer,

must be made of each mine contemplating rock dusting. Samples must be taken of the coal at different points in the mine, and of dust from the roads, and from rib, roof and timber in the approved manner, and then sized and analyzed. Likewise, the quantity of dangerous road and rib, roof and timber dusts in a specific stretch of passageway must be calculated with a view to determining whether they should be cleaned before rock dust is applied, also the approximate quantity of rock dust by weight that will be required to rock dust properly a given length of passageway. All records should be kept accurately and systematically.

It may be stated that in examining the records of the sizing and analysis tests of a number of samples of dust collected in entries of dry and dusty mines in the Pittsburgh bed before rock dusting was started, the average incombustible content of the haulage road samples was 43.5 per cent, the range being between 27.2 and 54.6 per cent. The average incombustible content of the same number of rib, roof, and timber samples taken at the same points was 30.8 per cent, with a range of 20.7 and 50.1 per cent. It might be added that the quantity of 200-mesh dust contained in the road samples, all of which had passed a 20-mesh sieve, ranged from 17.4 to 27.0 per cent. The quantity of 200-mesh dust contained in the rib, roof, and timber samples, all of which passed a 20-mesh sieve, ranged from 54 to 65.3 per cent.

A rock dusting testing kit is now on the market, and has been designed to collect samples, to make size tests of coal dust and pulverized rock dust, and to make a rapid "volumeter test" for incombustible matter in coal and rock dust mixtures. For convenience, the outfit is assembled in two distinct parts, one the sampling kit and the other the equipment necessary for sizing and testing. This outfit, with a few modifications, is that developed by the Bureau of Mines and is described in Technical Paper 144, a revised edition of which was published in October, 1924. With a little study, any responsible man about a mine can use this kit with a proper degree of accuracy and efficiency. It might be added that for all practical purposes, the carbon dioxide and inherent ash and moisture which may be in any particular coal, can be ignored in preparing calibration curves.

Physiological tests have shown that pure limestone dust is not injurious to health. This material is now commonly used at mines, principally because no mining company knows much about the pulverizing business and all desired to make an early start in rock dusting their mines. At mines practising rock dusting it is



agreed that the most convenient dust to handle, and obviously the most effective, is that dust all of which will pass a 50-mesh sieve, and at least 60 to 70 per cent of which will pass 200-mesh.

Limestone dust can be purchased from many limestone companies, and is usually shipped in 80-lb. sacks, similar to flour and cement, which arrangement facilitates and prevents loss in handling. Sacked limestone dust of which 50 to 60 per cent will pass through 200-mesh, can be purchased at Youngstown, Ohio, for \$4.50 per ton, plus freight charges to the Pittsburgh district of \$1.50 per ton, or a total of \$6.00 per ton. Limestone dust of which 75 per cent will pass 200-mesh and prepared for shipment in the same manner, can be purchased in Bellefonte, Pa., for \$5 per ton. Transportation charges to the Pittsburgh district are \$1.50 per ton, or a total of \$6.50 per ton. Sacked limestone dust, from Erie, Pa., 60 per cent of which passes 200-mesh, can be delivered in the Pittsburgh district for \$5.90 per ton, and dust 80 per cent of which will pass 200-mesh, at \$6.45 per ton.

# Machine Cuts Power Costs And Saves Copper

By Bettering the Power Factor of Present Circuits  
Expensive Changes May Not Be Necessary

By a British Correspondent

**S**YNCHRONOUS motors have been used for years to correct the power factor of alternating-current circuits. Their application in mine installations, however, has been limited to continuous-running machinery such as ventilating fans, air compressors and motor-generator sets. In these capacities the synchronous motor forms a useful adjunct to the electrical installations of mines. The original type of machine, with its salient poles resembling, in its construction, an ordinary alternating-current generator, has inherent weaknesses which militate against its use except in places where technical supervision is available. The synchronous motor and equipment entail a high capital cost, and require synchronizing gear as well as the ordinary switching equipment. Originally it had to be

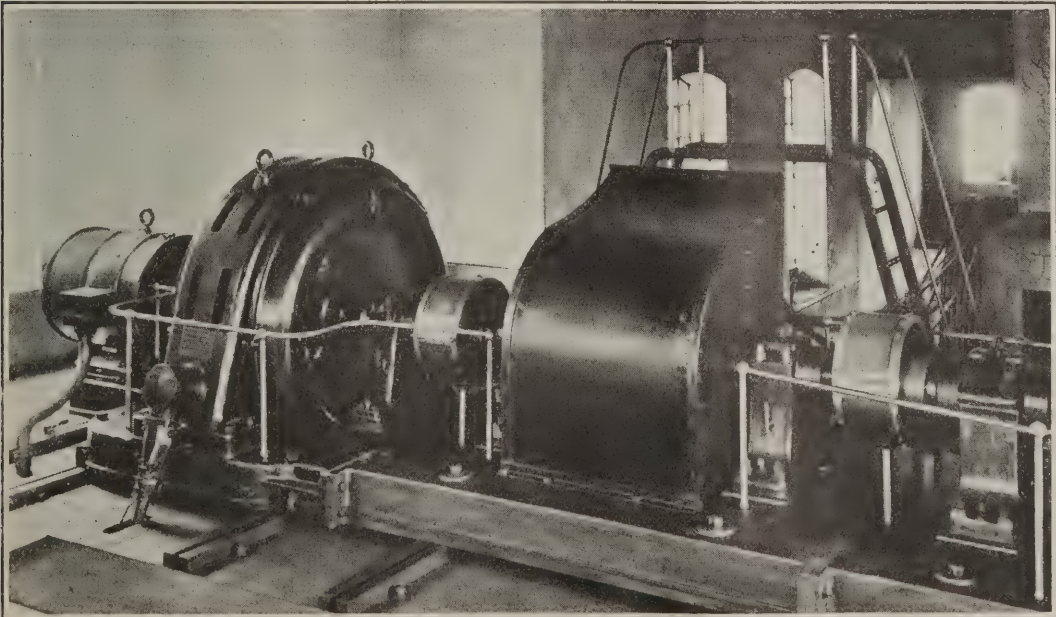
provided with an auxiliary motor, usually of the induction type and mounted on the same shaft, to bring it up as near as possible to synchronous speed, which could never be reached owing to the slip in the induction motor itself. A squirrel-cage damper winding is now employed for starting the more modern machines.

To synchronize effectually, the operative must be skilled, the operation often being attended with great difficulty, especially when the voltage and frequency of the power supply are unsteady, as indeed they often are where a fluctuating mine load is being carried by a comparatively small power plant. The difficulty is not entirely absent when power is supplied by a utility company which operates large generator units. However, the rapidly varying loads of the different consumers usually form a very small proportion of the total load carried by a large generating station and therefore do not so seriously influence either the voltage or frequency of the supply. Further disadvantages of the old-type synchronous motor are that any serious overload will cause it to fall out of step and come to a standstill, and that much time is lost when the processes of running up to speed and synchronizing have to be repeated.

These drawbacks of the synchronous motor have prevented many mines from adopting them even though they effect a large saving in line losses and also increase the power-carrying capacity of the power-distribution system. The effect of power factor on the current required for a given output on a three-phase system may readily be seen from the accompanying table which gives, for an output of 200 hp., the current necessary per line at power factors ranging from unity to 0.7 on a 400-volt circuit.

Current Needed with Varying Power Factor		
Horsepower	Power Factor	Amperes
200	1.00	215
200	0.95	227
200	0.90	239
200	0.85	253
200	0.80	269
200	0.75	287
200	0.70	308

It will be seen from these figures that a cable supplying 200 hp. at 0.7 power factor on a 400-volt circuit, has to carry about 43 per cent more current than it



Synchronous  
Motor with  
Rope Drive

Efficient slow-speed synchronous motors are now available for fan drives. When coupled to fans through speed-reducing devices a synchronous motor becomes a valuable asset to the mine property.



would if the power factor were unity. In that instance the raising of the power factor to unity would enable the same cable to carry more than 85 hp. of additional load at unity power factor. With old established plants contemplating extensions, power-factor improvement will often avert the heavy expense of scrapping existing cables and overhead lines for others of larger size. Therefore, should a suitable and cheap means of power-factor correction be available and one that does not entail the employment of expert operators, its advantages should appeal to the engineer of every mine alternating-current installation.

The asynchronous-synchronous type of motor combines in one machine the high starting torque common to the induction motor with the ability of the synchronous machine to operate at unity or even a leading power factor. Its construction is similar to the ordinary slip-ring induction motor, but the asynchronous-synchronous machine has four slip rings and has a small direct-coupled exciter. This type of motor, examples of which are shown in the accompanying illustrations, as manufactured by the English Electric Co., Ltd., of London, has the advantage over the salient-pole type of synchronous motor in that it has a high starting and synchronizing torque. Further, the salient-pole motor, as a rule, is synchronized when operating under reduced voltage, and this naturally increases the slip and reduces the power available during the synchronizing periods.

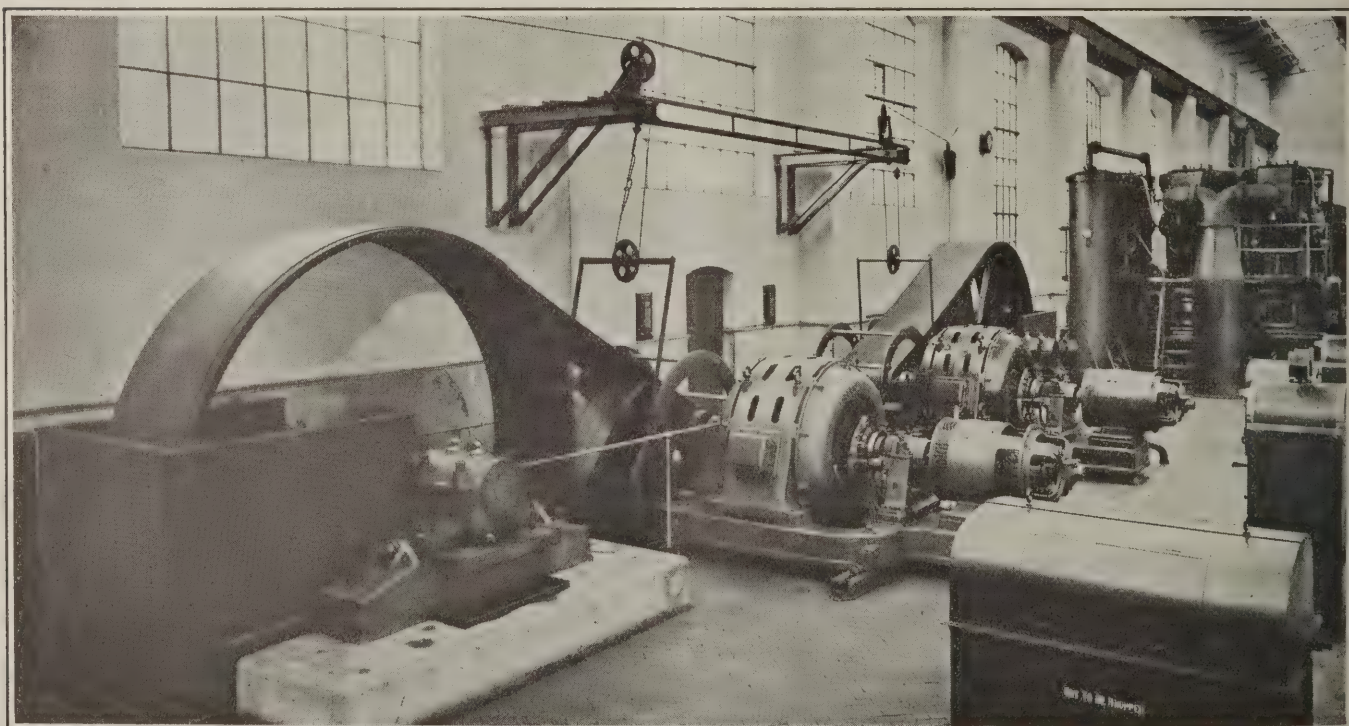
The efficiency of an asynchronous-synchronous motor of medium speed does not differ from that of the ordinary induction motor, yet it is from 0.5 per cent to 1 per cent higher at low speeds when built to operate at unity power factor. On the other hand, with a leading power-factor the efficiency is somewhat lower. The overload capacity of asynchronous-synchronous motors is roughly 70 per cent.

When being started the rotor is connected to an

ordinary type of liquid rheostat starter. After the motor is brought up to approximately full-load speed, by means of a double-throw switch the rotor leads are connected to an exciter. This affords additional torque which is alternately a motoring and a generating one as the rotor poles relatively slip backwards past the rotating stator field. The rotor increases in speed during the half cycle when the torque is motoring. Opposed to this increase in speed of course are the load torque on the motor and the inertia of the rotor and exciter to acceleration. Inversely proportional to the slip is the length of time during which acceleration takes place.

A useful feature of the asynchronous-synchronous motor is that it will synchronize without difficulty against a considerable overload. Moreover, when running in synchronism an excessive overload will have no more serious effect than to make the motor run as the ordinary induction type at a reduced speed. Immediately the overload is reduced to normal, the motor will again synchronize itself automatically.

As the asynchronous-synchronous motor runs at unity or leading power factor it may be employed to correct a low power-factor system, thus reducing the cost of feeder and substation extensions. If the asynchronous-synchronous motor does not have much lagging current of other power-consuming units to correct the design for unity power factor is the most suitable as it has greater efficiency and costs less than one rated for a leading power factor. For instance, a 500-hp. motor running at unity power factor on the same circuit as a similar machine operating at, say, 0.7 power factor will give a resultant of 0.9 for the total load of 1,000 hp. Everything considered, the asynchronous-synchronous motor is a desirable type of drive to install in suitable places about mines, for it combines in one machine the advantages of the induction and of the synchronous motor and thus corrects power factor.



**Complete Units Like These Frequently May Be Used To Better Voltage Conditions**

Air compressors, ventilating fans, pumps and motor-generator sets are specially suited to the use of synchronous motors. Heavy wattless currents flowing in conductors do no useful work, yet they necessitate oversized conductors and cause machines to heat unduly. The large quantity of power-factor corrective capacity is a synchronous motor while carrying a light mechanical load may often be used to advantage and save money.



# Ten Notable Points of Electrical Progress

Special Emphasis Laid on Emergency Provisions in Case of Power Failure—Gasoline Engines Though Less Economical Are Preferable to Oil Because of Lower First Cost

By GRAHAM BRIGHT  
Consulting Electrical Engineer,\*  
Pittsburgh, Pa.

**D**URING the past twenty years the use of electric power in and about coal-mining properties has so greatly increased that already most coal mines are using electric power exclusively, but a fair proportion in some parts of the country are still using steam for all or part of their power requirements.

It has been demonstrated that, where power can be purchased at a reasonable rate, an entirely electrified mine with purchased power is usually the most economical.

Among the recent developments toward the better and more economical use of electric power might be mentioned: (1) Long belt conveyor systems involving several miles of belt and requiring electrical equipment of the highest order to meet the exacting requirements of such a system; (2) the application of the synchronous motor to mine-fan drive, using new types of synchronous motors combined with internal and external clutches, operating either automatically or manually; (3) the application of the commutator type of alternating-current polyphase motor to mine-fan drives for variable speed operation; (4) the application of automatic substation and switching equipment to coal mine operation; (5) permissible locomotives and motors for safe application to gaseous mines; (6) new methods of bonding rails, including electric bonding machines; (7) magnetic and pneumatic types of control for locomotives and hoists; (8) small steam turbo-generators and the uni-flow engine for isolated plants; (9) development of high grade and reliable gears of spur, herringbone and worm type, enabling the use of high speed motors for hoist, fan, locomotive, pump, and conveyor drives; (10) emergency power units to supply power to keep up ventilation and remove men from a shaft mine in case of failure of purchased power.

A complete paper could be written on any one of the above subjects, but this paper will be confined to the last.

## LINE TROUBLE UNLIKELY

The service at a modern, up-to-date central-station power plant, will be, in general, more continuous than at an isolated plant. The transmission system of the central-station company may change this situation, for the power lines often pass over wild country and in most cases line trouble cannot be cleared up immediately. Where duplicate power lines from two different directions are available, a prolonged shutdown due to line trouble is little likely to occur.

In some cases steam plants are installed to obtain the highest percentage of continuity of service possible. This is generally a mistaken idea, as a serious shutdown is just as likely to occur with a steam engine as with an

electric motor. It has been found that where engines in coal mines have established a long record for continuity of operation, these engines are invariably greatly underloaded and consequently wasteful in the use of power.

The most important reason for providing emergency power is the safety it affords. It is usually applied in mines that are gaseous and where a shutdown of short duration may prove dangerous to men and property. This is particularly true in regard to gaseous shaft mines. Maximum safety is assured when emergency power is afforded to maintain the ventilation and remove the men from the mine in a short space of time.

## STEAM FOR EMERGENCIES

A number of mines, in changing from steam power to purchased electric power, have retained part or all of the steam plant for emergencies. This necessitates generating steam 24 hr. per day and also keeping the fan and hoisting engines in good condition. A mine thus equipped may not use the steam plant once a year, but the equipment should be tested frequently to be sure that it will be in operating condition when needed. The cost of maintaining such a system is unduly high.

A scheme now coming into common use is to install a gasoline- or oil-engine driven generator of about 100 kva. capacity. The generator is usually wound to suit the auxiliary hoist motor, which, in most cases, is a 2,200- or 440-volt, three-phase, 60-cycle wound rotor induction motor. The auxiliary hoist usually operates in the air shaft and in most cases hoists and lowers the men.

If the fan requires much power, and in a large gaseous mine, it usually does, there will not be sufficient power to operate both the hoist and the fan from the emergency plant, unless a two speed or variable speed fan motor is used, in which case the power required by the fan can be greatly lowered by reducing the fan speed.

As there is no particular object in obtaining economy in the operation of emergency equipment, a gasoline engine should be chosen rather than an oil engine. A high grade gasoline engine can be started in a minute or two with assurance, and because the period in which it is in operation is short, the fuel consumption is not an item to be considered.

A gasoline engine has been used to drive the fan direct, in case of emergency. This is accomplished by clutches. In most cases, however, the electric drive is simpler and more satisfactory.

There are many operations in the coal fields where there is no hoist in the auxiliary shaft and the men are hoisted and lowered in the main shaft. The main hoists of such mines usually have a capacity ranging from 300 to 600 hp.

The largest gasoline engine available has a capacity

NOTE—Article entitled "Recent Progress in Use of Electricity in Coal Mines," read at the Coal Mining Institute of America, Dec. 3-5 at its annual meeting held at Pittsburgh, Pa.

\*Howard N. Eavenson and Associates.



of about 300 hp. at 1,000 to 1,200 r.p.m. An engine of this type undoubtedly would be inadequate to supply power for the main hoist and the fan. The main hoist, however, usually operates at a speed considerably higher than that necessary and desirable for hoisting men. Furthermore, during the short period required to get the men out, it would be permissible to operate the fan at a reduced speed, provided it has not previously been stopped an appreciable length of time.

Manifestly, a scheme that would permit the hoist and fan to operate at reduced speeds without any loss of power other than the inherent machine losses, would permit the use of a moderate size gasoline-engine generator equipment. Such a scheme is available by the use of a reduced frequency and voltage. An induction motor will operate economically at a reduced frequency if the voltage is reduced in the same proportion. The speed also will be reduced proportionately. If the frequency is reduced 50 per cent the power and speed of the hoist motor will be reduced 50 per cent with the same load, and the power required by the fan motor with a 50 per cent speed reduction will be from one-quarter to one-fifth the full-speed power.

About a year ago, at one of the plants of the Youghiogeny & Ohio Coal Co., near Pittsburgh, a scheme involving the use of reduced frequency was installed for emergency service. At this plant are located two hoists, each being equipped with a wound-rotor induction motor of 400 hp. capacity and two fans each being equipped with a 150-hp. wound-rotor induction motor. The hoists and fans are within a few hundred feet of each other, and as the mines are gaseous it is extremely important that some ventilation be kept up while the men are being removed from the mine, in case of failure of power.

#### HOISTS OPERATED ALTERNATELY

A cage load of men weighs less than the usual load of coal and the maximum load during the hoisting cycle when hoisting men with power of one-half frequency is about 120 hp. The load on each fan motor at half frequency is about 35 hp. The hoists can easily be operated alternately by signal lights so that both are not taking power at the same time. Under these conditions the maximum load required is 190 hp. when one hoist and both fans are operating, and 70 hp. when only the fans are running.

The equipment selected to meet the above conditions consists of a 240-hp. high-grade Sterling gasoline engine of the Viking type, with dual ignition and dual starting equipment, direct connected to a 175-kva., 1,100-volt, three-phase, 30-cycle, 900-r.p.m., alternating-current generator. If necessary, this equipment could be operated at 40 cycles, in which case the engine would be operated at 1,200 r.p.m., and thus have a capacity of 320 hp. The generator would have a capacity of 233 kva. at about 1,475 volts.

To assure satisfactory operation a voltage regulator should be installed with outfits of this type. The equipment, referred to above, meets all the safety requirements, and can be placed in operation within one minute after failure of power. It is only necessary to press a starting button and operate a double-throw switch to substitute 1,100-volt, three-phase, 30-cycle power for 2,200-volt, three-phase power at 60 cycles.

Various combinations of generators can be used to

meet different conditions. Where pumping must be done it would be necessary to furnish full-frequency power for centrifugal-pump motors. This could be accomplished by an extra 60-cycle generator or a separate gasoline engine-driven generator.

Where a direct-current hoist is used with field control, a variable voltage direct-current generator could be used with the emergency set, and the speed of the hoist would depend upon the capacity of the gasoline engine.

An arrangement of a small steam turbo-generator receiving steam from one or more flash-type boilers may be feasible. Boilers of this type are used on steam automobiles and can be fired in a short time or kept under pressure automatically. The generator would be geared to the turbine and designed for full-frequency or reduced-frequency alternating current or direct-current, as conditions may require.

The advantage of the type of emergency equipment installed at the Youghiogeny & Ohio mine is that it is reliable and may often save the loss of a day's run, which, if repeated too often, will make it difficult to keep men. The equipment is not expensive, and therefore can be purchased by small as well as by large mines.

## Carnegie Institute to Train Graduates at Mines

Pittsburgh Mining Men Agree to Give Three Years Experience to Certain Number of Students Paying Them Salary the While

**A**N OPPORTUNITY will be afforded the student of bituminous coal mining to bridge the gap between the class room and the practice of mining, according to the announcement of Edward Steidle, supervisor of co-operative mining courses at the Carnegie Institute of Technology, Pittsburgh, Pa. This is the outcome of a report made by a special committee to the advisory board, Nov. 10 of this year, the chairman of the committee being J. M. Armstrong, general manager of the Pittsburgh Coal Co. The committee said:

"Business may owe the graduate nothing that it does not also owe to every young man, but it is good business to train promising young men in industrial methods and operations and this fact is demonstrated by the large number of corporations in nearly every branch of industry that offer training courses for college graduates. A college education should enable a young man to develop more rapidly than he would have done without the education, and the obtaining of such an education is to his advantage, because business will compensate him according to service rendered. The burden of delivery, however, is on the man.

#### COMMON SENSE BIG ASSET

"A college should teach a young man that his real training begins when he graduates; that in college his mind is trained only to a quicker comprehension of the problems with which he will meet in the course of his practical education; that his examination for entrance to the school of practical education will be at least as severe as his entrance examination to college; that while philanthropy may be business, business is not philanthropy, and that common sense will be one of his greatest assets; that if he is to succeed it will be neces-



sary for him in many instances to subordinate to practical considerations the theory that he has been taught.

"College graduates have been willing to go into a banking institution, start at the bottom and spend years in working up to the compensation equivalent to that of the inside laborer of a coal mine; into a mercantile establishment to become the head of a department; into a manufacturing establishment to get within sight of the headship of the department; but they have not been willing as a class to start at the bottom in the mining industry and stick until developed into men that any well directed company would feel justified in placing in control of its properties.

"If a college will encourage its mining graduates to follow coal mining, there will be no question that the mining industry will co-operate to such an extent that it will develop its entire official personnel from college-trained men."

The "Training Course in Bituminous Coal Mining for Technical Graduates," as it is to be termed, is designed to accommodate men of good physique and address having had a technical education either at the Carnegie Institute of Technology or elsewhere. The course will extend over two years, or twenty-four months, and will begin on or about July 1 of each year. A third year will be spent in specialized training. The student will not be bound by contract. While on the training course he will be considered as a student employee, not necessarily, however, as a coal loader or machine helper, but in all cases, unless otherwise warranted, he will work as a helper. In other words, at no time during the training course shall he be expected to be a total liability to the company.

Effort will be made to place him at a mine supervised by a fair-minded and helpful superintendent and mine foreman, but he may be moved from one mine to another as warranted. While at a union mine he will not be required to join the United Mine Workers of America. On completing the training course he will be interviewed by the general manager or general superintendent and may be assigned to a definite position during the third year, concentrating on the class of work in which he is most interested or for which he seems best fitted but involving some measure of respon-

sibility. At the end of the course of training, the company may rate and place the student or may drop him entirely. The student, in turn, may stay with the company or seek other employment.

#### SALARY TO BEGIN \$100 PER MONTH

At present the student will begin the course of training at a salary of \$100 a month, which will be increased \$10 at the end of each six months so that during the last six months he will receive \$130 a month. The pay during the third year will be the regular salary for the class of work performed. The employer is at liberty to drop the student at any time during the course if he shows a lack of interest in the work, does not perform it satisfactorily or does not mix well with the men.

Throughout the course of training the student will prepare comprehensive notes and follow as closely as practicable the headings and sub-headings indicated in the outline of training shown in the accompanying table. The officials of the Co-operative Mining Courses of the Carnegie Institute of Technology will keep in close contact with the student as approved by the mining company concerned. The College of Engineering will recommend for the degree of Engineer of Mines any student who has successfully completed the course of training and presented a satisfactory thesis on some phase of coal mining, provided further that he has had two years in responsible charge of work.

At present the State Department of Mines requires that applicants for the positions of mine foreman and fireboss must have had five years' experience in the bituminous mines of Pennsylvania. It is believed that this law will be revised, thus giving technical graduates in mining credit for two years of practical experience. This change in the law would allow students completing the training course to qualify for the state examinations for these certified positions.

At the end of the training course, the company will grade each student on the following points: Common sense, energy, initiative, leadership, reliability and general ability. If he has done satisfactory work, the company will give him an executive or operating position in the work for which he seems best suited.

### Outline of Training Course, Carnegie Institute of Technology

#### Subjects to Be Studied

<b>Trackwork</b> (Materials, tools and labor necessary to accomplish certain results, bonding, grading, costs).....	1 month
<b>Timbering</b> (Materials, methods of placement, quantity and labor needed, costs).....	1 month
<b>Wiring</b> (Equipment, size of wire needed, hangers and insulators, switches for all conditions, placing of switches, guarding, costs).....	1 month
<b>Drainage</b> (Elevations in mine and on surface, water centralization, pumping equipment, laying and connecting of pipe, guarding, costs).....	1 month
<b>Ventilation</b> (Volume needed, ventilating equipment, air-courses, stoppings, splitting of air currents, regulators bratticing, materials and tools necessary, costs).....	1 1/2 months
<b>Hoisting</b> (Hoisting plant, conveyors, operation, inspection and repair, costs).....	1 month
<b>Haulage</b> (Gradients, condition of tracks, condition of trolley wire and bonding, locomotives and their operation, mule and rope haulage, mine wagons, distribution of haulage partings, gathering in all its phases).....	1 1/2 months
<b>Shooting Coal and Rock</b> (Preparation of face, placing of holes, types of explosive, placing of explosives, tamping and material for same, precautions necessary).....	1 month
<b>Mining</b> (Nature of coal being worked, top to be cared for, development methods, undercutting in advance and retreat, roof control, recovery of timber, modified methods, care of abandoned workings, costs).....	2 1/2 months
<b>Coal Preparation</b> (Tippie design, sizing of coal, cleaning, weighing, trimming, costs).....	1 month
<b>Supplies</b> (Quality and quantity, receipt and distribution, records, costs).....	1 month
<b>Power and Substations, Surface and Underground</b> (Machine types, housing, lubrication, safeguarding, repairs, costs).....	2 months
<b>Clerical</b> (Timekeeping, payrolls, records including costs, house rents, coal sales and reports to general office).....	2 months
<b>Shop</b> (Work on all classes of electrical and mechanical appliances, pumping equipment and sufficient time in stock room to become familiarized with different classes of stock, costs).....	2 months
<b>Supervision and Inspection</b> (Superintendent, mine foreman, assistant mine foreman, fire boss, company inspector, costs).....	1 1/2 months
<b>Personnel Work</b> (Medical insurance, welfare, costs).....	1 month
<b>Engineering Corps</b> (Surveying, construction, drafting, costs).....	2 months
<b>Reports in Engineering Department</b> (Detailed investigation, valuation, surface and underground layouts).....	1 1/2 months
<b>Total</b> .....	24 months





## Hail to the New World's Record Coal Mine!

Valier Mine in Southern Illinois Establishes New Mark

By Hoisting 8,664 Tons in One Day

ON NOV. 25, another world's record was established. On that date the Valier Coal Co.'s mine at Valier, in southern Illinois, in 8 hr. hoisted more coal than any one shaft, so far as is known, ever produced before in the history of coal mining—8,664 tons. This exceeds by 446 tons the greatest day's hoist previously produced—the record of 8,218 tons established some time ago by the Orient No. 1 mine of the Chicago, Wilmington & Franklin Coal Co., at West Frankfort, Ill. Another of the “whopper” southern Illinois mines—Zeigler No. 1 of the Bell & Zoller Coal Co.—in October made the largest month's hoist in history—189,240 tons. Thus the record-breaking habit is strong in this region.

The Valier mine, owned and operated through a subsidiary by the Burlington railway, has long been recognized as a good 6,000-tonner but nobody expected it to break a world's production record. Changes in management and methods during the past year have increased the capacity of the plant without the installation of much additional equipment. Thus the great day's run of Nov. 25 was made possible without previous notice.

### MADE OVER TWO THOUSAND DUMPS

In the eight hours of hoisting on that day, the time lost totaled nine minutes. Two minutes were required for cleaning the sump, three were lost by a car getting stuck in the dump, power was off for one minute and three more minutes were consumed rerailling a load on the bottom. A total of 2,036 dumps was made which gives an average load of approximately 4.3 tons per car throughout the day. Only 600 cars were in coal service on the day in question so that they averaged about 3.5 round trips each, an unusual performance.

Naturally the neighbors wondered what made it possible for Valier to make such a huge run, and searched for causes. The best reasons they could find were as follows: On Nov. 24, the day previous, the dump broke at 12:40 p.m. The underground workings continued to produce coal for 2 hr., 10 min., or until 3 p.m. when the mine blew “all over” for the day and the last man came out. Of course some coal was produced and placed on wheels for the next day during this 2 hr. 10 min.

However, the critics certainly would agree that there would be nothing left over after the tremendous run of the 25th, yet on the 26th the mine produced 7,681 tons without half trying and with absolutely no preparation. This gives much justification to the claim that the mine has the “greatest” tonnage ever hoisted from a single shaft.

### TONNAGE EXCEEDS ESTIMATE

In the June 24, 1920 issue of *Coal Age*, Carl Scholz, who opened the property and designed the equipment, stated that the main shaft was planned to produce 6,500 tons daily. It is clear that it has a much larger capacity. For reaching the large tonnage the leisurely method of the two-car rotary dump and skip are used. Without unusual hustle such equipment makes possible a large tonnage. The skip has a capacity of 15 tons and the guides are of 85-lb. track rails.

The hoist is arranged for automatic acceleration, automatic slow-down and stop. It is necessary only for the operator to close the control switch in order to start the hoisting cycle. A pilot motor then turns the controller to the full-speed position, whereupon this motor is cut off and unclutched. Near the end of the travel of the hoist, cams turn the controller to the off-position and when this is reached the brakes are automatically applied.

One of the factors that permitted the large output to be made, doubtless is to be found in the large cars. Originally designed to hold 5½ tons they were, as stated earlier in this article, hauling only 4.3 tons, but even that is a tonnage per car that gives large economies in operation. Though shaft sinking was started in September, 1917, and coal was reached in May, 1918, and despite the fact that the Valier mine made remarkable advances in tonnage, it has taken over seven years to reach this preeminence. This is a clear indication of the long period between the inception of a coal project and the attainment of maximum output.

W. M. Dickson, purchasing agent for the Valier Coal Co., is acting general manager. F. F. Green is superintendent. D. W. Jones is electrical engineer and Charles E. Anderson underground manager.



# Live Topics Elicit Animated Discussion at Meeting of West Virginia Coal Mining Institute

Rock Dusting, Pneumatic Separation of Coal and Electrification of Gaseous Mines by Storage Batteries Hold Interest at Winter Session—Lambie is New President—First-Aid Meet Well Managed

By J. H. EDWARDS  
Associate Editor, *Coal Age*  
Huntington, W. Va.

**R**OCK DUSTING, pneumatic separation of coal and electrification of gaseous mines by storage batteries, were the subjects dealt with at the winter meeting of the West Virginia Coal Mining Institute held at Welch, W. Va., Dec. 2 and 3. This meeting, quoting Frank Haas, consulting engineer, Consolidation Coal Co., "was one of the most successful in the history of the institute." The first morning session was attended by more than seventy-five men, this, according to Joseph Reed, retiring president of the institute, being almost a record attendance at an early morning session on the first day.

William J. O'Toole, general manager of the American Coal Cleaning Corporation, read a paper on pneumatic coal separation. He reviewed the progress of the dry-cleaning process to its present stage of development, citing a number of first class installations now in operation. He declared that treatment by air is yet in its infancy, but that water cleaning has already been perfected to a point where inherent characteristics limit further important development.

In his paper Mr. O'Toole stated that the use of rotary screens instead of other types would reduce the operating cost of the extensive sizing which is required for pneumatic separation. He also emphasized the point that the substitution of air cleaning for washing would eliminate the pollution of streams which is now becoming a serious problem.

He described the problem of handling the dust encountered with the first installations. A material increase in the volume of air drawn from above the table and into the dust collecting system has solved this difficulty. The ordinary cyclone collector system is satisfactory except in cities having strict anti-smoke ordinances, in which cases the bag type of collector must be used.

## DUST COLLECTOR LESSENS FIRE HAZARD

Answering a question, R. M. Lambie, chief of the West Virginia Department of Mines, said, in substance, that at a plant which is equipped with the latest type of cyclone dust collector there is no longer any fire hazard from dust floating about in the building.

Thomas Fear, general superintendent, Inland Collieries Co., Indianola, Pa., suggested the possibility of reducing the quantity of dust by treating the coal with oil or in some other manner before it goes to the air cleaner, or possibly before being dumped.

Questions were asked Mr. O'Toole regarding the commercial value of the dust. He stated that some dust had been sold at \$15 per ton for foundry facings. He added, however, that this market is limited. He also said that for some unexplained reason the dust runs higher in ash than the coal as received.

Mr. Fear read a paper describing rock dusting experience at the Indianola mine. Last February, sprinkling, for which approximately 20 miles of pipe was used, was abandoned in favor of rock dusting. There is now 58 miles of dusting in the Indianola mine. The present practice is to redust whenever an analysis of road dust samples indicates below 55 per cent of combustible content.

During May this mine used 2 to 3 lb. of limestone dust per lineal foot of entry, and the cost of dusting was 1.1c. per lineal foot. During the last six months the company's records show an average of 4,000 ft. of entry dusted in eight hours, at a cost of \$40.60. The experience to date indicates that if entries are dusted twice a year it will cost 2 mills per ton, and if dusted four times per year, 4 mills per ton.

A recent analysis disclosed that about 50 per cent of the rock dust applied last spring and which during the summer had become caked by moisture, had returned to such a condition that it would be thrown into suspension in case of a violent disturbance.

Mr. Fear's paper was followed by a lively discussion which brought about a comparison of conditions at Indianola and what might be encountered in a seam such as the Pocahontas No. 3. Mr. Lambie stated that in West Virginia no credit on compensation is allowed for rock dusting. Mr. Fear said that in Pennsylvania 10c. is allowed per \$100 of payroll.

## MAIN HAULWAYS DUSTED TWICE A YEAR

Mr. O'Toole asked how often per year the entries at Indianola must be dusted. Mr. Fear replied that present experience indicates that the main haulways must be dusted twice a year. About 300 tons of rock dust has been put into the Indianola mine this year.

Mr. Crawford, of the Mine Extension Department, University of West Virginia, inquired about the loading of machine cuttings into the bottom of the car, before shooting. Mr. Fear stated that this practice has been abandoned, the coal now being shot down on top of the dust. Replying to a query on how close rock dusting is kept to the face, Mr. Fear explained that entries are kept dusted to the last cross-cut, which ordinarily means a maximum of 80 ft. left undusted.

The possible difficulties of effective rock dusting in seams such as the Pocahontas No. 3, as compared to the Pittsburgh seam, which is mined at Indianola, were discussed by Mr. Lambie. The higher percentage of fines and lower height of entries were mentioned as possible difficulties. Mr. Fear stated that after a recent trip through a Pocahontas No. 3 mine he concluded that there is no more dust being deposited than at the Indianola mine. He also stated that low height with attendant greater air velocities would have little



effect in dislodging the rock dust from ribs and roof. He said that it is only the first trip passing through a newly dusted entry which dislodges any appreciable quantity of the dust. The second trip brings down very little.

At Indianola, washing down the ribs with water before rock dusting is not done, as rock dusting is not so effective if the ribs are slightly wet. Furthermore, it has been found that the blast of rock dust when being applied actually washes down to the floor a large percentage of the coal dust.

In his paper Mr. Fear described the advantages of rock dust stemming and he indicated this practice is being followed at Indianola. He cited as advantages, greater safety, a saving of 20 to 30 per cent in the quantity of explosive and an increase of 9 to 20 per cent in the quantity of lump coal.

Following Mr. Fear's paper, John T. Ryan, Mine Safety Appliance Co., Pittsburgh, Pa., gave an illustrated talk on sampling—and analyzed mine road dust and exhibited and demonstrated a compact commercial outfit for determining the non-combustible content by the specific gravity method. This method of analysis is correct to within about 5 per cent, the greatest error being introduced by the varying moisture in the sample. A correction can be made, however, if the quantity of moisture in the sample is known.

It was recommended that of the samples collected only that portion passing through a 10-mesh screen be brought out for analysis, and that this be further reduced by a 20-mesh screen before making the specific gravity test. Mr. Ryan stated that in France the regulations require that mine dust samples show 70 per cent of non-combustible before being considered entirely safe.

In answer to a defense of sprinkling Mr. Ryan stated that it requires at least 30 per cent of moisture in coal dust to insure any degree of safety, but that such a content does not remain fixed any definite length of time. A rock dust content, on the other hand, undergoes much slower changes.

#### ELECTRIFICATION GROWTH DESCRIBED

The paper read by John B. Hicks, of the Consolidation Coal Co., Fairmont, W. Va., on electrification of gaseous mines by storage batteries, described a new departure in methods of utilizing electricity with greater safety for coal cutting and handling. Developments in design of straight storage battery locomotives with safe electrical equipment, for gathering and handling, were described. The power truck or, in other words, the self-propelled portable storage battery for furnishing power to a mining machine, is a departure which, perhaps, no company besides the Consolidation has tried.

Experience with a number of these power truck outfits has demonstrated their practicability for gassy mines, indicating that their adoption in any mine may be considered from the standpoint of economy alone.

In the discussion Mr. Knight asked how teetering is avoided in the main haulage battery locomotive which was described in the paper as being 19 ft. long and having a 70-inch wheelbase. Mr. Hicks explained that the battery compartment is adjustable so as to obtain good balance and that the use of a long journal box with coil springs located about 12 in. apart also aids in overcoming any tendency the locomotive might have to teeter.

At the business meeting of the institute the following

officers were elected: President, R. M. Lambie, chief of the West Virginia Department of Mines, Charleston, W. Va.; first vice-president, T. M. Downing, Jr., general manager Logan Coal Corporation, Lundale, W. Va.; second vice-president, George Wolfe, secretary Winding Gulf Coal Operators Association; third vice-president, C. C. Morfit, secretary Tug River Coal Operators Association; fourth vice-president, E. S. Wade, West Penn Power Co., Beech Bottom, W. Va.; fifth vice-president, J. E. Lawall, head of mine extension department, University of West Virginia, Morgantown.

Executive committee—Frank Haas, consulting engineer, Consolidation Coal Co., Fairmont, W. Va.; W. E. E. Koepler, secretary Pocahontas Coal Operators Association, Bluefield, W. Va.; F. F. Carson, consulting mining engineer, Crane & Cole Co., Huntington, W. Va., and W. E. Fohl, consulting mining engineer, Pittsburgh, Pa.

The new president, Mr. Lambie, presided at a banquet of members which was held in the evening. Jack Morris, general manager of the MacBeth Coal Co., Logan County, and Thomas Stockdale, inspector of District 17, furnished vocal and instrumental entertainment.

#### REAPING THE UNDERGROUND HARVEST

The second day of the meeting was taken up by an automobile trip to nearby mines and by a first-aid contest. The first stop of the trip was at Gary No. 6 mine, where the visitors saw in operation the coal cutting and loading machine of Col. Edward O'Toole. This machine with its 43-ft. cutter bar, reminds one of the method used in the great wheat growing belts for harvesting grain. Like the large grain heading machines, it cuts a wide swath through the field, catches the material on a platform and elevates it into cars.

The party also visited the Gary power plant, where they saw two 750-hp. boilers being fired with powdered bone coal. Each furnace has five feeders, these blowing in and releasing the powdered fuel at a point 28 ft. from the floor of the combustion chamber. The bone coal is shipped in railroad cars to the power plant from nearby mines of the United States Coal & Coke Co.

From Gary the institute members were taken to Coalwood, where they were the guests of the Consolidation Coal Co. at a luncheon served at the club house. F. K. Day, general superintendent at Coalwood, was introduced as the man responsible for this wonderfully satisfying part of the day's program.

In connection with the institute meeting the McDowell County first-aid contest was held under the auspices of the Tug River and Pocahontas Coal Operators Association, the U. S. Bureau of Mines and the National Safety Council. Seventeen teams competed and, thanks to C. C. Morfit, who supervised the meet, there was no evidence of the confusion and long delays which are so often noticed at first aid contests.

The winning team from Exeter shaft of the Kingston-Pocahontas company, and captained by C. R. Angove, received a large silver trophy. According to the judges' score, two teams tied for second place, these being the team of the American Coal Co., McComas, captained by John W. Smith, and the team of the Lake Superior Coal Co., Superior, captained by Ray Ingole. The toss of a coin gave second place to the American company team, each individual member receiving as second prize a five dollar gold piece. A medal was given by the National Safety Council to each member of the three teams mentioned above.





# News Of the Industry



## Jacksonville Agreement Fails to Cure Ills of Coal Industry

Forty-three per Cent of Country's Mines Shut Tight—Puts Wagon Mines Off the Map—Competitive Situation Unchanged—  
Legislation Impends in Congress

BY PAUL WOOTON  
Washington Correspondent of *Coal Age*

Eight of the thirty-six months which constitute the life of the Jacksonville agreement have passed. It has been in effect long enough, however, to produce some extraordinary and far-reaching results, and the leaven has only begun to work. It has shut down absolutely 43 per cent of the mines. Without question it has concentrated coal production at the low cost properties, but it has only accentuated the cutthroat competitive situation between the union and the non-union fields.

When the Jacksonville agreement was signed the general feeling was that coal would cease to be a public issue for the three years it would run. The developments of the presidential campaign led many to believe that the coal industry would be allowed to work out all phases of its own salvation without being trammelled by the public or any of its official representatives. In the meantime, however, Congress has assembled. Bills are to be introduced in each house of Congress, it is understood, which will have a bearing on the coal industry. They may not propose regulation, but they will remind the industry that legislators are going to continue to suggest means which they think will bring about better functioning of an industry on which the whole public welfare rests. Certain plans, not yet ready for announcement, are being formulated in the executive departments.

### Public Opinion in Evidence

Striking evidence that the pressure of public opinion is behind these moves is had in the recent address of F. R. Low, retiring president of the American Society of Mechanical Engineers, who expressed satisfaction that the people's interest in power from hydro sources is protected by the federal water power act, but who brought out as one of the principal points of the message he left with his fellow engineers and with the country, that "an uninterrupted and abundant supply of power cannot be assured to the nation at reasonable rates so long as the fuel from which most of it is made is subjected to the uncontrolled manipulation of private interest and the organized

will—or won't—of labor." He cited as the "one crumb of comfort" in the report of the Harding Coal Commission its declaration that the mining and distribution of coal are charged with public interest.

The Jacksonville agreement was expected to freeze out the high cost mines. That it has done with a vengeance. No wagon mine has operated for over a year. Even among the more pretentious mines a large number are idle. A recent report to the U. S. Geological Survey shows that of 2,389 mines reporting 1,032 had been closed down. More than a thousand well equipped coal mines were not adding a ton to the country's production or contributing to any payroll. On the other hand, there were 295 mines which operated full time and 350 more that operated five days but less than six. The first part of the story is that the agreement has closed 43 per cent of the commercial mines and the business they formerly had has gone to some 25 per cent of the mines remaining, those better situated as to costs or markets.

### Finish of Many Mines Seen

It remains to be seen whether the 43 per cent will stay closed. They will hang over the market until their equipment is scrapped. The probabilities are that most of them cannot stand three years of starvation.

The second part of the story, however, is different. There has been no alteration in the competitive situation between the North and the South, between the union operators with rigid wage scales and the non-union operators with flexible wage scales. The Jacksonville agreement simply has made the inequalities of the competitive struggle even more cruelly apparent. The business not only has been shifted from small to large mines but it has moved in millions of tons from union to non-union districts. Before the Jacksonville agreement can be said to have settled the coal problem it will have to provide for this second aspect.

One of the results predicted was a reduction in the union scale. That is very likely to come, but it does not

### Talk of Queer Bedfellows!

To the miners' union the name "chamber of commerce" is as the scarlet to the bull. The International constitution of the union even specifies that union miners will have nothing whatever to do with a chamber of commerce. Yet what do we see out in Missouri? The miners' union of District 25 is trying its best to get the chambers of commerce of Missouri to co-operate in a "burn Missouri coal" movement and to enlist the chambers in a battle to give Missouri coal a more favorable freight rate in intrastate traffic.

constitute a permanent solution. It simply reduces the level below which the non-union operators must keep their wages in order to live. Even with union wages pegged where they are this has not been a profitable year for the non-union operators. They have shipped a large amount of coal, but few of them are doing more than breaking even. If union wages are reduced the pay at non-union mines will be reduced still more.

A result predicted by some is the distintegration of the union. It has been forced already to retreat from southern West Virginia and eastern Kentucky. Its hold on northern West Virginia, central Pennsylvania and the Southwest has been loosened. But even were the union to be broken up it would not constitute a permanent solution. Non-union territory simply would be swelled to larger proportions and even a more intensive competitive struggle would occur between non-union operators themselves. The more the union shrinks the more the non-union districts will find themselves in the condition that the whole country experienced during the nineties, when there was no agreement on wage rates and every man's hand was raised against his neighbor. The Jacksonville agreement has yet to demonstrate that it can settle the ills arising from union and non-union competition.

The feeling on Capitol Hill has not crystallized, but it is apparent that the legislators sense that the public has not forgotten its interest in coal. They also sense a very general feeling that the coal industry is not in an entirely healthy state. With the ever present desire on the part of the legislator to be doing something with matters which affect a large percentage of the people, there is no guarantee, even at this short session, against some agitation of coal legislation.



## Mine Accidents Claim 154 Lives in October; 10 Months Total 1,979

Accidents at coal mines in the United States during October, 1924, caused the death of 154 employees, according to reports received from state mine inspectors by the U. S. Bureau of Mines. The production of coal for the month was 54,487,000 tons; hence the fatality rate was 2.83 per million tons, as compared with 3.83 in the previous month and 3.11 for October last year. At bituminous mines throughout the country 123 men were killed and the fatality rate was 2.63 per million tons, as against 2.85 in October, 1923. At anthracite mines in Pennsylvania the number of fatalities was 31, indicating a fatality rate of 4.04, as compared with 4.59 for the same month last year.

The accident record for the year 1924 to Oct. 31 shows a total of 1,979 accidental deaths at the mines. Based on an output of 458,512,000 tons during the 10-month period, the fatality rate was 4.32 per million tons as compared with 3.91 for the corresponding months last year. For bituminous mines alone the 1924 rate for the ten months was 4.14 as compared with 3.63, while for anthracite mines alone it was 5.22 as compared with 5.56. The increase in the fatality rate for bituminous mines in 1924 was due to the larger number of deaths from explosions of gas and coal dust.

As no single accident in October killed as many as five men, the record of "major" disasters during the first ten months of 1924 shows 9 disasters with a loss of 452 lives as compared

## Miner Loses Two Thumbs From One Hand; Seeks Double Compensation

Born with two thumbs on the right hand, and losing them recently in a mine accident in the anthracite district of Pennsylvania, Anthony Cusatt, a miner, in a letter to the office of District 7 of the United Mine Workers, at Hazleton, last week, asked that he receive the backing of that body in an action for double compensation.

Cusatt wrote that the company employing him, the name of which he failed to give, had offered compensation for only one thumb at the rate of \$12 a week for sixty weeks. It is the most unusual case that has come to the attention of union officials, said John Yourishin, district secretary-treasurer, who looks after compensation claims of the miners.

with 8 similar accidents and a loss of 260 lives during the same months last year. The fatality rate based exclusively on major disasters stands at 0.99 per million tons for 1924 and 0.48 for the first ten months of 1923.

Explosions of gas and coal dust are the only class of accidents with increased fatality rates for 1924; for this group the fatality rate increased from 0.60 per million tons for January-October, 1923, to 1.13 per million tons in 1924.

## P. & W. V. Segregation Plan Approved by Stockholders

Pittsburgh & West Virginia Ry. stockholders have approved the proposal of the directors for the segregation of the Pittsburgh Terminal Coal Co. from the railway company. The proposed increase in the funded debt to \$3,000,000 by the issuance of equipment trust certificates also was approved.

F. E. Taplin, chairman of the board, said Dec. 2 that the segregation of the coal property and the retirement of the preferred stock would not be interfered with by any action on the part of the Interstate Commerce Commission regarding the proposed issue of equipment trust certificates. In an informal report on the application for authority to issue the certificates an examiner for the commission recommended that it be disallowed. Mr. Taplin said that even if the commission should uphold this report the Pittsburgh & West Virginia would adhere to its plan for the retirement of the preferred stock on the date designated.

The Department of State and Finance at Harrisburg, Pa., has approved the merging of the Pittsburgh Terminal Coal Co. and the Meadow Lands Coal Co., the name of the former being used. The capital stock of the company is \$17,200,000. The officers of the merged company are: C. E. Tuttle, New York, president; L. H. Kelly and G. F. Osley, Pittsburgh, vice-presidents; A. J. Appel, Pittsburgh, secretary, and E. C. McKibben, Pittsburgh, treasurer.

## Coal-Mine Fatalities During October, 1924, by Causes and States

(Compiled by Bureau of Mines and Published by Coal Age)

State	Underground										Shaft				Surface						Total by States						
	Falls of roof (coal, rock, etc.)	Falls of face or pillar coal.	Mine cars and locomotives.	Explosions of gas or coal-dust.	Explosives.	Suffocation from mine gases.	Electricity.	Animals.	Mining machines.	Mine fires (burned, suffocated, etc.)	Other causes.	Total.	Falling down shafts or slopes.	Objects falling down shafts or slopes.	Cage, skip or bucket.	Other causes.	Total.	Mine cars and mine locomotives.	Electricity.	Machinery.	Boiler explosions or bursting steam pipes.	Railway cars and locomotives.	Other causes.	Total.	1924	1923	
Alabama	3		2	1								9													9	10	
Alaska																									0	0	
Arkansas																									0	0	
Colorado		1	1									2													2	9	
Illinois	4		1									5				2		2					1		1	8	12
Indiana	1			4								5													5	6	
Iowa	1											1													1	2	
Kansas	1											1													1	2	
Kentucky	8		2	3	1		2		1			17										2	2	19	9	9	
Maryland		1										1													1	0	
Michigan																									0	1	
Missouri																									0	1	
Montana																									0	0	
New Mexico	2											2													2	4	
North Dakota												1													1	0	
Ohio	6	1				1						7													7	11	
Oklahoma	1											1													1	0	
Pennsylvania (bituminous)	7	5	6				1		3			23	1					1	1				1	1	25	29	
South Dakota																									0	0	
Tennessee																									0	0	
Texas																									0	0	
Utah	1											1													2	2	
Virginia	2											2													2	4	
Washington	1	1										2													2	1	
West Virginia	15	2	5						1			26						1					2	3	29	34	
Wyoming	2											2													2	2	
Total (bituminous)	55	11	17	8	7		6		5			109	2		3		5	2	1			3	3	9	123	140	
Pennsylvania (anthracite)	17	2	7		2							29						2							31	40	
Total, October, 1924	72	13	24	8	9		6		5		1	138	2		3		5	4	1	2		3	3	11	154		
Total, October, 1923	93	6	34	13	8		6		3		7	170	1				1	4	1	2		2	3	9		180	



## Budget Allowance Lower For Bureau of Mines And Geological Survey

The President and the Director of the Budget have approved proposed appropriations for the next fiscal year of \$1,876,560 for the Bureau of Mines and \$1,654,595 for the Geological Survey. These amounts compare with \$1,900,468 and \$1,706,482, respectively, appropriated for the work of the current fiscal year. If Congress insists on paring the budget in the same proportion as has been its custom, it will mean heavy curtailment of the work done by these two agencies. It is believed, however, that Congress will take into account the fact that drastic reductions have been made in the amounts originally requested by the heads of the separate executive agencies, and the prospects favor the actual appropriation of approximately the amounts carried in the budget.

Among the items making up the Bureau of Mines budget are investigating mine accidents, \$400,000; general expense, \$86,000; mining investigations in Alaska, \$33,000; operating mine rescue cars and stations, \$281,840; testing fuel, \$155,000; oil, gas and oil shale investigations and leasing work, \$456,000; enforcement of mineral leases, \$86,920; mining experiment stations, \$200,000; care of buildings and grounds at Pittsburgh, \$65,000.

Items making up the Geological Survey budget are preparation of reports on the mineral resources of the United States, \$123,000; geologic maps, \$105,000; examination and classification of lands, \$265,695; gaging streams, \$165,000; investigations of the mineral resources of Alaska, \$72,000; chemical and physical research relating to geology, \$40,000; geologic surveys in various portions of the United States, \$326,140; topographic surveys, \$485,000; Director's office, \$54,760; preparation of illustrations, \$18,000.

## \$5,000,000 Company Formed In Central Pennsylvania

With the organization of the Madill Coal & Coke Co., at Indiana, Indiana County, with a capital stock of \$5,000,000, one of the largest deals in recent years in the coal industry in central Pennsylvania has been brought about. The active head in the movement is John Madill, of Indiana. The project is backed by Pittsburgh, Buffalo and Eastern interests.

The corporation has taken over large coal acreages in Indiana and Cambria Counties, where plans have been matured to open mines, build a railroad, erect a town and otherwise complete what will become one of the largest operations in the district.

Plans have been completed for the construction of a railroad connecting the mines of the company with the Buffalo, Rochester & Pittsburgh, the Pennsylvania R.R. and the Cambria & Indiana Ry. This road will give access to the Buffalo and Canadian markets, as well as facilitate shipments to the East and tidewater. The road also will connect with Johnstown and the Bethlehem Steel Works there.



**James Elwood Jones**

Vice-president, Pocahontas Operators' Association but better known as the developer of the celebrated Coloder machine at the mines of the Pocahontas Fuel Co. The loader fills 370 tons of coal daily in actual everyday operation.

## Hard Coal Regions Want Part Of Tax for Local Use

*Special to Coal Age*

Scranton, Pa., Dec. 8.—Indications point to a concerted move by members of the Legislature from the anthracite region to bring about a return of about 50 per cent of the money collected by the state under the present anthracite tonnage tax to the communities and cities in which hard coal is mined. The anthracite tax is collected on a basis of 1½ per cent of the market value of all coal produced and sold.

The move to obtain a portion of the tax for the direct use of the citizens residing in anthracite communities has been launched by the Scranton Chamber of Commerce. The organization is enlisting the support of various municipal bodies throughout the anthracite region in the project.

The fight will not be a new one in the state Legislature. In the 1923 session a similar bill was passed, but vetoed by Governor Gifford Pinchot. In vetoing the measure the Governor declared that the state needed every cent of revenue it could lay its hands on to "clean up the mess."

With this session of the Legislature improved state financial conditions will be used as a further argument toward the passing of the bill providing for a return of part of the tonnage tax. An anthracite bloc of legislators will be organized and, it is believed, will push the measure through.

## New Haven Seeks New Bids

Announcement has been made that the bids received on Nov. 17 by the New York, New Haven & Hartford R.R. Co. for furnishing and delivering alongside, Boston, 400,000 gross tons of high volatile run of mine coal have been rejected and that new bids will be received up to Dec. 15 for between 360,000 and 410,000 net tons of the same quality of coal. This contract will run for one year from May 1 of next year.

## Union Affairs in Muddle In Hard Coal Region as Result of Outlaw Strike

*Special to Coal Age*

Scranton, Pa., Dec. 8.—The outlaw strike of 12,000 Pennsylvania & Hillside Coal & Iron Co. mine workers in the Pittston anthracite field has developed many complicating angles. It has created a furor in district union circles that may end disastrously for the present executives of the district. When the strikers refused to return to work upon the demand of John L. Lewis, president of the international union, the charters of the local unions disobeying the order were revoked and as a result 12,000 former United Mine Workers are now non-union men.

As the international union did not want to lose these men, however, President Lewis has sent a commission of five International executive board members into the Scranton district for the purpose of counselling the men to return to work and restore peace and harmony in the district, intimating that "if they fall in line" their charters will be returned. The commission met with the general committee of the strikers, but was unable to console the men to the circumstances and as a result the strike is still on.

A new phase of the situation has assumed magnified proportions. It is in the form of a call for a special convention of all local unions of district 1, demanded by the strikers and indorsed by the general grievance committees of the Hudson Coal Co., the Glen Alden Coal Co., the Lehigh Valley Coal Co. and the Lehigh & Wilkes-Barre Coal Co., representing over 50,000 mine workers of the district. A formal petition for the convention will be filed with the executive board of the district within the next few days. It is expected that the majority members of the board will refuse the demand. An appeal may then be made to the international union board. The purpose of the convention is expressed by the strike leaders as an effort to "investigate the muddled conditions of the district and place responsibility for the improper handling of grievances."

Neal J. Ferry, of McAdoo, Pa., is chairman of the special international union commission sent here by president Lewis. Other members are Ed Dobbins, of Belleville, Ill.; John M. O'Leary, of Pittsburgh, Pa.; John Mates, of Williamstown, Pa., and John Ghizzoni, of Homer City, Pa. They will stay in the district, they say, until the situation is adjusted.

## Anthracite Circular Prices For December

(Gross Tons F.O.B. Mines)

	Chest-			
	Broken	Egg	Stove	nut
Lehigh & Wilkes-Barre.....	\$8.00	\$8.75	\$9.00	\$8.75
D. L. & W.....	8.00	8.75	9.00	8.75
Pattison & Bowns (Erie).....	9.00	9.00	9.25	9.25
Phila. & Reading.....	9.15	9.15	9.40	9.40
Hudson Coal Co.....	9.00	9.00	9.00	9.00
Lehigh Valley.....	8.50	8.80	9.15	9.15
Lehigh Coal & Navigation Co.....	9.25	9.25	9.50	9.25
M. A. Hanna Co.....	8.80	9.15	9.85	9.40
Steam sizes—Buckwheat No. 1, \$3@3.15; rice, \$2@2.25; barley, \$1.50; birdseye, \$1.60.				



## W. A. Phillips, Well Known W. Va. Operator, Dies

W. A. Phillips, president of the Pemberton Coal & Coke Co., Affinity, W. Va., died Dec. 3 at the Lankenau Hospital, Philadelphia, where he had been for several weeks taking treatment for stomach trouble. Many years ago he started in the coal mines of the anthracite fields in an humble way. Realizing the possibilities of smokeless coal he and others from Schuylkill County, Pa., migrated to the Pocahontas fields of West Virginia, where they acquired valuable property. Later he went to the New River field, where he organized the Pemberton Coal & Coke Co. and acquired some valuable land in the Winding Gulf field. In this field he developed three mines, the companies which developed and operated them still owning and operating the same properties. Mr. Phillips also was president of the Ashland Coal & Coke Co., located in the Pocahontas field, and the Majestic Colliery Co., in the Williamson field. He also was extensively interested in the banking business at Mount Carmel.

Mr. Phillips was 84 years old. Funeral services were held at his late home, at Mount Carmel, Pa., Saturday afternoon, interment being at Fountain Springs Cemetery, Ashland, Pa.

## Reverses \$18,000 Judgment For L. & N. Against Nield

Judgment obtained last year in the Jefferson Circuit Court by the Louisville & Nashville R.R. against C. S. Nield, of Kettle Island, Bell County, Ky., was reversed, with directions that the petition be dismissed in an opinion delivered Nov. 21 by Judge E. S. Clarke, of the Kentucky Court of Appeals. The judgment, obtained in Judge Davis Edwards' court at Louisville, was for

## Lists Efficiency Experts Among National Wastes

National extravagance is the greatest danger to American prosperity, Robert E. M. Cowie, president of the American Railway Express Co., stated in an address before the Canadian Club of New York at the weekly luncheon at the Belmont Hotel, in New York, last week. Mr. Cowie attacked waste, the craze for efficiency agents and purchase on time payments as cardinal weaknesses, and described this country as "the most profligate of nations in the matter of waste and extravagance in business affairs."

The speaker, while admitting a greater need for efficient management in business, said that the idea of calling in outside assistance to create an efficient condition had been overdone.

\$18,000, representing a claim for \$11,000 and interest for ten years.

The L. & N. in its action sought to require Mr. Nield to pay for construction of 2,000 ft. of branch railroad track in Bell County, that being part of a branch from Pineville to coal properties in Kettle Island Creek. The appellate decision set forth that the railroad had not established a claim against Mr. Nield.

The branch was constructed in 1909 and 1910 at the instance of the Edgemont Coal Co., of which Mr. Nield was a stockholder. The other stockholders in the coal company resided in Atlanta, Ga. When the coal company planned to develop its property in Bell County, at the mouth of Kettle Creek, the L. & N. agreed to construct the necessary branch road.

## Constitutionality of Tax On Anthracite Upheld By U. S. Supreme Court

The U. S. Supreme Court on Dec. 8, without a written opinion, affirmed the decision of the lower court upholding the constitutionality of the Pennsylvania anthracite tax. An appeal was made by the Cranberry Coal Co. and others.

At the conclusion of arguments by counsel for the coal companies, on Dec. 4, the Supreme Court asked attorneys representing the state not to present oral argument. This is the usual course in cases where the court is convinced that there is no material merit in the appeal.

At its last term the Supreme Court upheld the constitutionality of this tax on anthracite levied by the State of Pennsylvania, which had been challenged by a number of mining companies on the ground that it was a tax on interstate commerce. At that time the court held that coal is a local commodity until placed on cars for interstate shipment, and that the tax was constitutional because it applied on coal before being loaded.

Following this decision a number of anthracite operators brought a new test case, the one just presented the Supreme Court. In effect, the basis of this action was that the state tax was applied by the weight of the coal; that it was not weighed as raised at the mines, no scales for the purpose being available, but was weighed in the cars after having been loaded for interstate shipment, therefore giving it an interstate commerce nature. The lower courts held that the time of weighing was a matter of convenience and an incident.

## Output and Value of Coal from Ohio Mines in 1923

(Compiled by U. S. Geological Survey)

County	Loaded at mines for shipment (net tons)	Sold to local trade and used by employees (net tons)	Used at mines for steam and heat (net tons)	Made into coke at mines (net tons)	Total quantity (net tons)	Total value	Average value per ton	Number of employees				Average number of days worked
								Miners, etc., a	All others.	Surface	Total	
Athens.....	4,133,625	76,744	74,959		4,285,328	\$10,315,000	\$2.41	5,765	1,786	930	8,481	109
Belmont.....	12,689,439	406,506	99,185		13,195,130	31,100,000	2.36	8,327	3,076	1,390	12,793	193
Carroll.....	353,394	85,172	20,496		459,062	1,204,000	2.62	362	129	64	555	202
Columbiana.....	863,307	55,169	23,266		941,742	2,747,000	2.92	686	241	241	1,168	187
Coshocton.....	213,433	14,464	3,179		231,076	655,000	2.83	404	143	76	623	103
Guernsey.....	3,070,277	167,833	81,127		3,319,237	8,240,000	2.48	2,784	1,246	391	4,421	144
Harrison.....	2,695,323	17,249	53,382		2,765,954	6,168,000	2.23	1,220	424	1,032	2,676	145
Hocking.....	1,016,931	72,235	9,481		1,098,647	2,688,000	2.44	1,753	459	302	2,514	98
Holmes.....	250	2,725			2,975	8,000	2.81	8			8	148
Jackson.....	194,413	59,636	11,397		265,446	840,000	3.15	777	285	157	1,219	66
Jefferson.....	5,739,482	691,365	76,163		6,507,010	16,069,000	2.47	3,769	1,568	1,559	6,896	188
Lawrence.....	25,665	114,783	343		140,791	348,000	2.47	269	71	42	382	121
Mahoning.....	476	46,874	12		47,362	174,000	3.67	65	10	7	82	190
Medina.....		10,485	400		10,885	61,000	5.60	15	4	3	22	235
Meigs.....	1,166,420	26,926	23,983		1,217,329	3,141,000	2.57	1,847	694	333	2,874	114
Morgan, Scioto, and Washington.....	211,559	3,552	3,745		218,856	530,000	2.42	283	103	49	435	126
Muskingum.....	411,826	65,205	3,594		480,625	1,121,000	2.33	537	123	170	830	141
Noble.....	690,169	9,482	19,269		718,920	1,798,000	2.50	513	308	83	904	156
Perry.....	2,430,799	53,419	54,733		2,538,951	5,762,000	2.27	2,519	777	797	4,093	122
Portage, Summit and Wayne.....	80,027	21,624	16,803		118,454	475,000	4.01	136	50	43	229	159
Stark.....	127,185	311,249	5,128		443,562	1,345,000	3.03	406	109	74	589	206
Tuscarawas.....	977,253	356,332	16,739		1,350,324	3,311,000	2.45	1,382	507	382	2,271	131
Vinton.....	90,965	3,239	2,905		97,109	238,000	2.45	294	112	84	490	81
Total excluding wagon mines.....	37,182,218	2,672,268	600,289		40,454,775	98,338,000	2.43	34,121	12,225	8,209	54,555	150
Wagon mines served by rail.....	91,668				91,668	272,000	2.97					
Grand total.....	37,273,886	2,672,268	600,289		40,546,443	\$98,610,000	\$2.43					

a Includes also loaders and shotfired.



## Scranton Companies Reject Higher Tax Valuations

Scranton, Pa., Dec. 8.—Coal companies of Scranton have practically rejected a request by the city administration that they agree to pay additional 1924 assessments representing a tax on a coal land valuation higher than \$200 per foot acre, the figure on which the payments have thus far been based. The city treasury is in financial difficulties and it is understood that counsel for the coal companies have agreed to come to the rescue, but will not consider any further tax payments if they are to be construed as an agreement to a higher assessment than the \$200 valuation. The coal companies in a formal appeal to court are protesting the increased valuation of their coal lands by the city and do not want to prejudice their case by paying on the new valuation.

## S. G. Memory Moves Up in D. L. & W. Coal Co.

Samuel G. Memory, who was sales agent for the Delaware, Lackawanna & Western Coal Co. in Newark for fourteen years, has been elected a vice-president of the company, with offices at 120 Broadway, New York, according to an announcement by Eliot Farley, president of the company. Mr. Memory will have general supervision over line sales and coal handling facilities. H. A. Smith, connected with the company for six years at the New York office, has been re-elected a vice-president.

Mr. Memory's successor as sales agent at the Newark office is A. W. Decker, for twelve years superintendent of the Newark pockets of the company, but more recently connected with the Scranton agency. A. H. Pace is the new sales agent at Scranton and the estate of L. R. Schenck has been appointed sales agent at Toledo, Ohio.

## 21 Miners Rescued, 1 Killed In Nova Scotia Cave-in

A series of shocks that resembled an earthquake caused a cave-in of the roof of the Springfield Mine, near Amherst, N. S., Dec. 6, entombing twenty-two miners. After more than three hours' digging twenty-one of the men were rescued and the body of John Sweeney was recovered on Sunday. The heavy fall of earth took place on the 5,400 ft. level. Four shocks in quick succession brought down the roof of the mine, cutting off the miners working at this point and crushing Sweeney beneath the debris.

## U. P. Coal Co. Standardizes Practice for Safety

The Union Pacific Coal Co. has undertaken the preparation of a complete set of standards to be compiled for the use of superintendents and foremen, above and below ground, to govern all underground installations, including pump stations, transformer stations, motor generator substations, underground hoist installations, electric transmission and trolley line installation, bonding, standard track layouts, including standard switches, frogs and turnouts, standard rock dust barrier troughs, methods of underground rock dusting, etc. The purpose is to provide plans for the initial installation of all tracks, electric lines, underground construction, etc., on a definitely uniform basis, insuring maximum safety, as well as economy in construction and operating costs.

The coal company proposes to draw on the resources of its entire engineering and operating organization, obtaining in addition all possible information and advice from representatives of other companies, past recommendations of mining engineers, expressed through the several associations, etc.

The company has already made real progress for safety. It has substituted improved closed electric lamps for open lights in its seventeen Wyoming mines and has installed a shale pulverizing plant to advance its dusting program.

## Utility Fuel Consumption Up; Power Output at Peak

Electric public utility plants consumed 3,206,083 net tons of coal in October, according to a report by the U. S. Geological Survey, compared with 3,013,184 tons in September, as shown by revised figures. Fuel oil consumed by utilities plants in October totaled 1,401,624 barrels, as against 1,389,264 barrels in September.

The average daily production of electricity by public utility power plants in October was 167,300,000 kw.-hr., which was 4½ per cent greater than the daily output in September and practically equal to the record rate of January.

## Canadian Miners Vote to Form Own Union

Miners employed by the Crow's Nest Pass Coal Co. at Coal Creek and Fernie, B. C., voted to sever connection with the United Mine Workers of America and organize a Canadian union, it was announced following a secret poll on Saturday, Dec. 6.

## Nine Miners Die in Explosion In Welsh Mine

Nine miners were killed in a coal mine explosion Friday morning, Dec. 5, in the Llay Main colliery, near Wrexham, one of the largest mines in North Wales and also considered one of the safest. Ernest Williams, the mine foreman, fired a shot, which was quickly followed by a terrific blast caused by the setting off of a collection of gas.

Five men who were just beyond the range of the fire, gave the alarm and help was at once sent down. The first band of rescuers encountered the deadly firedamp. They were without gas masks, but for two hours they managed to fight the fumes. Eventually the bodies of the victims were recovered.

About 1,400 of the 3,000 men usually employed in the mine had already descended and twenty had got to work near a seam in No. 1 pit when the explosion occurred. It was the third disaster in British coal mines within nine days.

## Missouri Gets Some Scales For Machine Mining

After more than five weeks of conferences between operators and miners of Missouri, a detailed machine scale for the Richmond and Swanwick fields recently was completed in the offices of W. L. A. Johnson, general commissioner of the Southwestern Interstate Coal Operators' Association, Kansas City. The contract is on a basic scale of \$1.15½ a ton plus 14.4c. for pushing. The pushing clause was responsible for the length of the conference.

A detailed machine scale, based on the Richmond scale, also was arranged for the mine of the Mosby Block Coal Co., Mosby, Mo., reopened a little more than a year ago after several years of idleness due to water.

Another contract, one establishing a pick scale on a basis of \$1.92½ a ton at the mine of the St. Joseph Coal & Mining Co., Vibbard, Mo., also was signed during the conference.

## Want Illinois Institutions to Use Coal from That State

United Mine Workers officials of Illinois have issued a statewide appeal to miners and other unionists of the state to use none but Illinois coal. The State Executive Board, President Farrington has announced, instructed August Kerr, chief counsel for the mine workers, to draft a bill for presentation at the next session of the Legislature providing for exclusive use of Illinois coal in state-owned institutions.

A resolution to support this measure will declare: "In some instances municipally and state owned institutions of Illinois are being furnished with coal mined outside the State of Illinois. We believe that it is wrong for the taxpayers' money to be sent outside the State of Illinois to purchase any product which can be furnished in abundance in the state, and we believe that the policy of trading at home should be practiced by the State of Illinois, especially within the state, and produced by Illinois labor."

### Power Plant

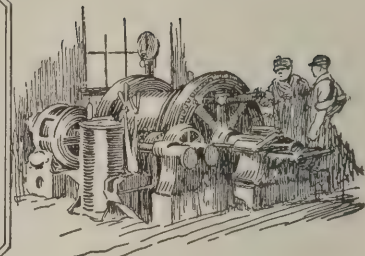
Just being completed to supply Teas branch of No. 1 mine, North-East Coal Co., at Thealka, Ky. It comprises two 150-hp. boilers, one feed-water heater, an engine and one 100 kw. direct-current belted generator, this equipment being moved from the exhausted mine No. 2.







## Practical Pointers For Electrical And Mechanical Men



### Welded Cast-Iron Specimens Reveal Strength of Electric Process

THE STRENGTH which may be attained in welding cast-iron parts with a new electrode, without any special heat treatment, has been determined by tests represented in Figs. 1 to 6, inclusive, made by the General Electric Co. The methods of making these tests will no doubt be useful to mining companies which can often

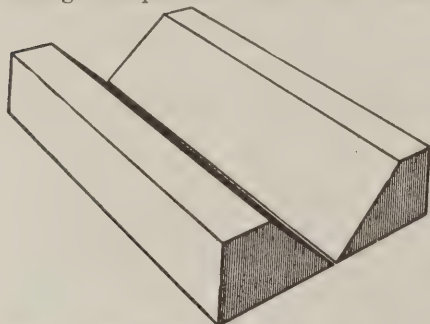


Fig. 1—How the Parts Were Shaped

Most materials can be welded efficiently if the groove to be filled is shaped to form a 90-deg. opening. When this angle is reduced the arc has a tendency to flash to the side of the V and thus not permit the deposited metal to unite the lower parts.

effect large savings by a more general application of electric welding.

Fig. 1 shows two blocks of gray cast iron, beveled along one edge at a 45 deg. angle preliminary to welding. Fig. 2 shows the same block assembled on two steel bars to which they were welded at the outer edges for rigid support. The welding was continuous; in parallel beads and horizontal layers as seen in Fig. 2. Care was taken to obtain suitable overlapping and interpenetration of the beads, but no effort was made to remove slag except by a wire brush which cleaned away the

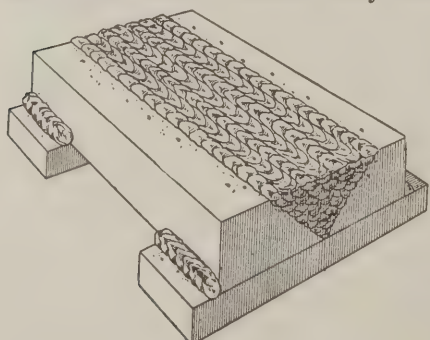


Fig. 2—One Layer Is Built Up on the Other

Fast welding is not always desirable because it permits the metal to cool too quickly.

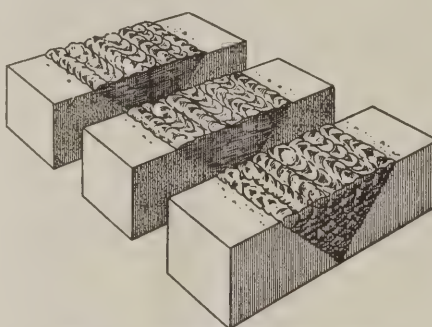


Fig. 3—Sectionalized for Tests

The test pieces were obtained by cutting the specimen so that the stresses could be applied properly to the welded material.

loose material. The finished weld was permitted to cool naturally in the air, and then cut away from the steel supporting bars and machined into transverse segments for test specimens, as

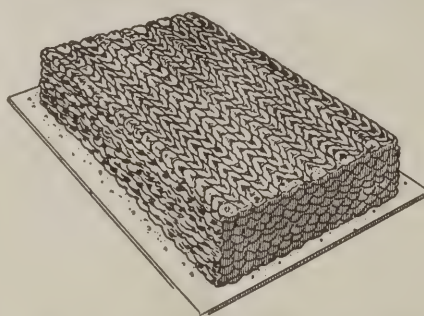


Fig. 4—Preparing Material for Test

Layer upon layer of metal was deposited so that a test specimen of the electrode material could be obtained.

shown in Fig. 3. These were turned down to the A.S.T.M. standard dimensions for cast-iron tensile test specimens, except that the length was somewhat increased to include the weld properly between the shoulders of the specimen. As illustrated in Fig. 5, these specimens broke mostly outside of the welds the strength varying from 60 to 90 per cent of the base material. This reduced strength is due to the effect of the welding heat upon the cast-iron base material. Welds made under the same conditions with a standard bare electrode broke away from the cast iron during cooling because the deposited metal was not sufficiently ductile to release the internal strains set up in the weld.

Fig. 4 shows a block of metal deposited on a steel plate by the welding electrode for the purpose of obtaining



Fig. 5—How the Specimen Broke

Note that the deposited material did not break, instead, the fracture was in the material adjacent to the weld.

specimens for tensile tests. The plate was then cut away and the block cut up and machined into specimens and tested. The appearance after test is illustrated by Fig. 6, the ductility of the metal



Fig. 6—Welding Rod Material Stretched

Note that the specimen elongated when tested. This proves the high ductility of the metal.

being shown by the elongation and reduction of cross section near the point of rupture. The test showed the following results:

Specimen	Ultimate Tensile Strength Lb. per Sq. In.	Yield Point Lb. per Sq. In.	Per Cent Elongation in 2 In.	Per Cent Reduction of Area
1	59,300	46,700	12½	13.3
2	54,800	45,700	11	18.2
3	59,000	45,600	12	21.8

### Conveyor Necessitates Use of Improvised Lubricator

It is always a problem to lubricate small moving parts so that each will receive the necessary oil to keep it working freely. At one of the Consolidated Coal Co.'s mines near St. Louis, the loading boom, like many others, consists of sections which travel on small iron rollers. Each of these rollers must be continually lubricated to prevent undue friction and wear. It would be unduly expensive to keep a man on the job to lubricate these parts, so the mechanics designed an automatic lubricator for the purpose.

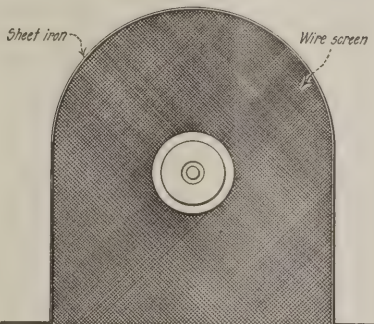
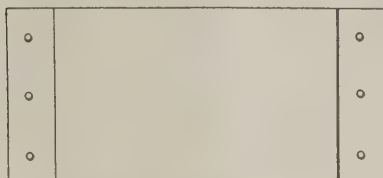
As shown in the illustration, Fig. 1, the lubricator is made of a piece of pipe and pipe fittings. The ends of a short section of pipe of about 4 in. diameter were fitted with couplings and plugs. The bottom plug was tapped to admit a small piece of ½-in. pipe which leads to a valve and then to a leather wick. The piece of leather is of such length that it just reaches the top of the rollers of the loading boom. As each roller goes by, it wipes the oil off the wick and is thoroughly lubricated. The valve controls the quantity of oil flowing to the wick and is necessary because the viscosity of the oil changes from time to time. In summer, when



## Motor Easily Screened Off from Dust

Next to vibration and leakage of oil, dust causes more damage to equipment than anything else. Herewith is illustrated a cover used to screen off a motor from particles of coal which might otherwise easily fall upon it and damage the insulation.

The top part of this housing is made of sheet iron formed into the shape of an arch. At both ends is a screen which permits sufficient air to pass through the motor but prevents large



**Housing Protects Machine Against Dust and Dirt**

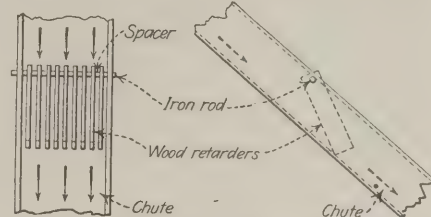
A piece of sheet iron and two pieces of wire screen were the only parts necessary to make this housing.

pieces of falling material from getting on the windings or the commutator. Much of the dust in the air clings to the screen and is thus prevented from settling on the motor. Housings of this type, and all housings in general, must be applied to motors only after the heating characteristics of the motor have been thoroughly investigated. If it is already heavily loaded, a screen

or covering cannot be applied unless some means is provided for obtaining proper ventilation. Most housings obstruct the circulation of air and thus cause the motor to heat unduly even under light load.

## Prevents Coal from Breaking

Operators have long despaired of the possibility of sloping chutes and screens in such a manner that the coal would move steadily forward and yet would not travel so fast as to break up unduly. The speed with which coal travels over a screen influences its action and usefulness. When coal bounds forward at a high rate of speed it bounces over the holes of the screen

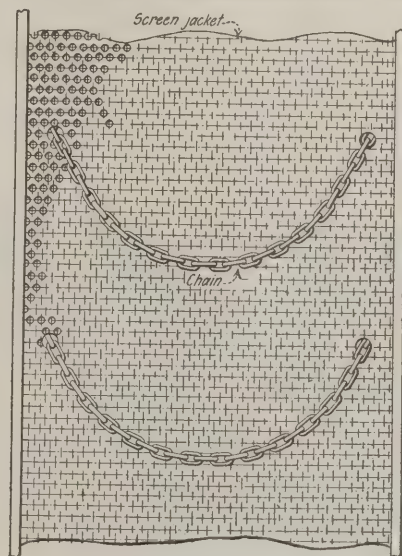


**Fig. 1—Wood Retarders Slow Down Coal**

Pieces of wood fastened to a through bolt prevent the coal from passing too quickly down the chute.

and therefore is not properly sized. A more serious difficulty, however, is the breaking down or degradation of the coal when it bumps against obstructions or jostles other coal. Again, if coal is traveling at a high velocity when it drops into the bin, it breaks up considerably.

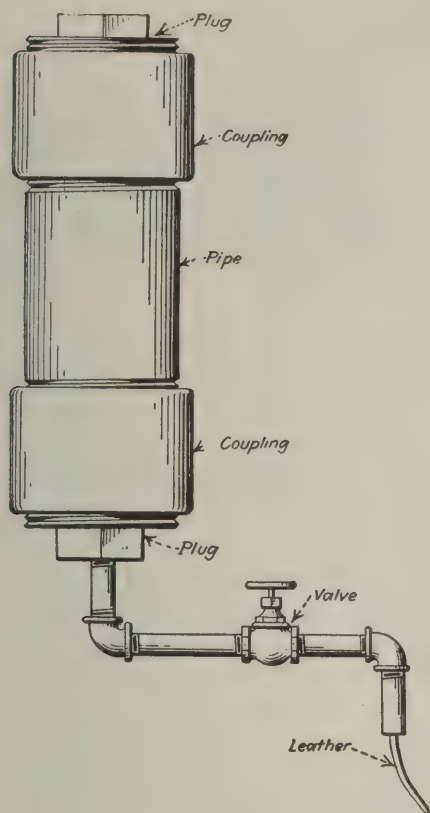
Many ingenious methods have been



**Fig. 2—Chains Slow Down Coal**

The chains are fastened to the screen by hooks. By increasing the number of such chains the coal may be retarded making the sizing better and lessening breakage.

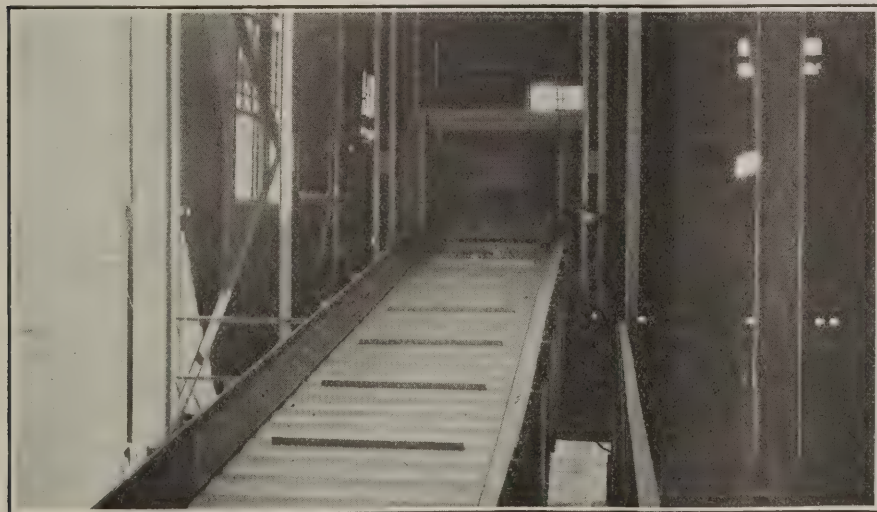
employed to slow down the speed of coal. Fig. 1 shows wooden retarders set in a chute. The spacing and number of retarders is easily varied to control the speed of the coal. Fig. 2 illustrates chains with hooks at each end which can be attached to the screen jacket. By applying more or fewer of these chains the coal passing over the jacket may be speeded up or retarded.



**Fig. 1—Ingenious Lubricator Made of Pipe Fittings**

A few simple parts to be found around almost any mine make up this little device. Dust and dirt are kept out of the oil the flow of which is regulated by a valve. The leather wicks the part to be lubricated and each receives its proper quantity of oil.

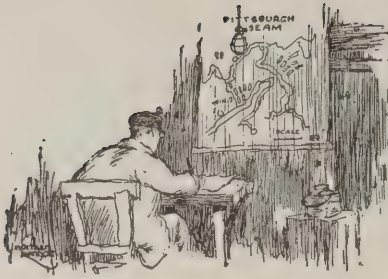
the oil runs freely, the valve is kept nearly closed, but in winter the valve must be opened sufficiently to give the proper flow. The plug at the top of the lubricator excludes all dust and dirt from the oil. Occasionally a few quarts of oil are put in the lubricator and the top screwed on. Little or no attention is required because the device when once adjusted works automatically. The leather wick is constantly covered with oil.



**Fig. 2—Traveling Parts All Require Lubrication**

As the failure of any part of a conveyor shuts down the whole line, this one is provided with necessary lubrication by an automatic oiling device made at the mine and illustrated in Fig. 1. The lubricator works at all times regardless of the position of the boom.





## Problems In Underground Management



### Car Holds Rock for Gob, Clay for Shots or Serves As a Platform for Mixing

A specially constructed clean-up car, which also serves several other purposes, is being used in the mines of the Island Creek Coal Co., of Holden, W. Va. The body is fabricated of 4-in. steel plate, braced with su table angles and straps and mounted on a standard mine-car truck. Details of its construction may be seen in the accompanying illustration.

Double 3x6-in. crosspieces, or joists, rest on the floor of the regular truck and support the steel body of this car. The lower blocks are as long as the truck floor is wide, and the upper pieces extend out over the wheels and support the floor plate of the steel body. This floor plate is made in one piece so that a smooth surface is afforded for shoveling. The ends of the car body are stiffened and joined securely to the floor of the truck by means of steel straps.

#### SIDES EASILY DETACHED

Each of the two sides can be completely detached from the car by releasing a set of hook latches. This allows the side to swing away from the ends and disengage its three keepers. Each of these consists of a U-shaped bracket, attached to the wooden cross-supports, into which fits a strap-lug, or tongue, fastened to the lower edge of

the side plate. This car has a capacity of 100 cu.ft. Its greatest use has been the transportation of gob material to abandoned rooms. Here the load is quickly discharged by easy shoveling from the flat floor plate after the sides have been dropped. It is also useful for carrying clay tamping to the working places from the outside of the mine. With the sides removed the one-piece floor makes an excellent platform for mixing concrete for use in the building of stoppings, overcasts and similar underground structures.

### Pennsylvania Roof Hazard Is Greatest in Morning

At a meeting of Pennsylvania state anthracite inspectors with Secretary Joseph J. Walsh, at Sunbury, Pa. earlier this month a letter was drafted that points out the preponderance of accidents due to falls of roof that occur in the early hours of the day. A similar letter to bituminous operators was drawn up in a meeting of bituminous state mine inspectors in Pittsburgh, on Oct. 15. The contents of these letters discloses the following facts:

During the first eight months of this year 144 fatal accidents in the anthracite mines and 122 fatal accidents in the bituminous mines were caused by falls of roof and coal. Of these, 76 in the anthracite mines and 43 in the bituminous mines occurred before an examination of the working places had

been made by the mine foreman or his assistants, while 16 in the anthracite mines and 15 in the bituminous mines took place shortly after an examination.

In the anthracite mines 65 per cent, and in the bituminous mines 60 per cent of the accidents due to falls of roof occurred between the hours 7:30 and 11 a.m., during which time in all the mines only 35 per cent of the official visits of the day were made. These facts clearly indicate that the number of accidents due to falls of roof might be greatly reduced by better supervision of the working places.

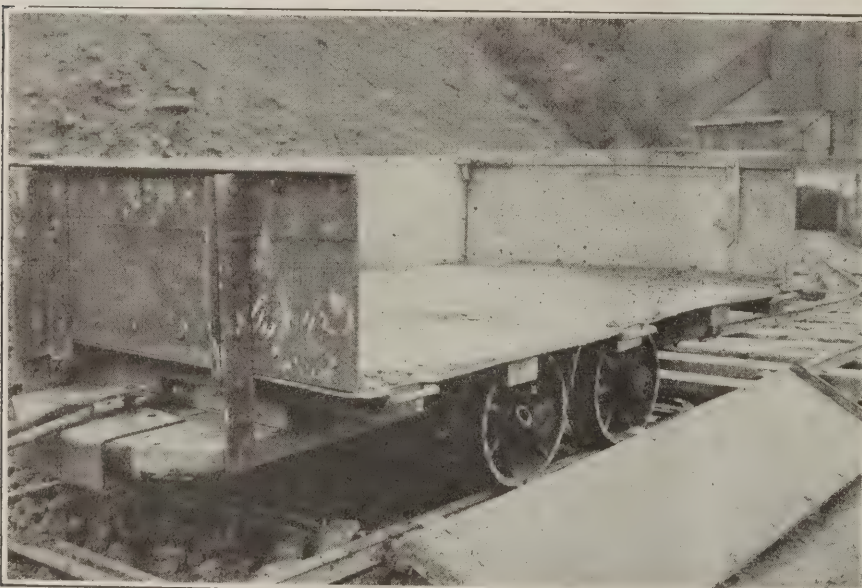
#### DAILY EXAMINATIONS URGED

Resolutions directed to the mine owners were drawn up by both bodies of inspectors urging the examination and making safe of every working place each day before 11 a.m. The resolutions admonish the mine officials who depend solely on observation in judging the condition of the roof in working places and recommend the use of a bar always for making the tests.

### Safety on Inclined Planes

Since a disaster occurred at East slope of the Nunnery mine, near Sheffield, England, one of the engine planes in that mine has been equipped with a device consisting of five specially built cars, fitted with tight couplings and springs to absorb shock. This has been placed in front of the man trip. The leading car of the five carries a strong sharply pointed iron sprag in suspension ready to be dropped in case of necessity. This car also carries about 1,000 lb. of scrap iron to give it the necessary stability. The iron sprag is connected by a cable to simple apparatus in the fifth car by which the former can be released by the operative and made to fall to the floor of the entry should the trip get out of control or the haulage rope break. The car in which the operative rides is padded, and he is secured to his seat by a broad strap around the waist to prevent him from being jerked upwards or out of the car.

Another device, which is being used is entirely mechanical. In this also five specially designed cars are required. The apparatus is placed on a steel frame running on wheels and consists of two pairs of sprags or forks, one pair pointing upward and the other downward and designed to grip the roof and floor of the entry respectively. The projecting sprags are controlled by a governor set so as to bring them into action if a predetermined speed is exceeded.



Most Mine Cars Are Boxes on Wheels, but This One is Different

When the sides are removed by detaching the hooks at either end the car is a one-piece flat plate mounted on wheels and forms an excellent platform upon which to mix concrete for underground structures.





# Production And the Market



## Soft-Coal Business Fitful as the Weather; Anthracite Trade Softens

With only fitful touches of cold weather here and there the bituminous coal trade exhibits marked irregularity. The spurt in the Middle West faded away almost as quickly as it appeared and inactivity best describes conditions there now, as it does also in Ohio and Kentucky. The situation in New England is somewhat the same only much worse. Business in Atlantic coast markets, the Southwest and the Northwest is somewhat better, especially in the last named section, where the lake season is making a Garrison finish; November shipments inland for November, in fact, are said to have been the largest in any one month during the last two years. Though total shipments are far behind those of a year ago the carryover to this season was such as to bring the supply up to normal requirements. The cessation of shipments to the lakes has hit production hard in the Ohio fields and much distress coal has reappeared, and it sells at figures that tend to demoralize prices.

General industry continues to show slow but steady improvement, iron and steel production in particular reporting pronounced gains. Perhaps the most promising development since last spring, however, was the announcement that 116 Fall River cotton mills employing 20,000 workers were to resume operations this week on full time—and without any reduction in wages. Some of these plants have been closed for many months. Only five mills will remain closed.

### Hard Coal Trade Fair but Featureless

The situation in the anthracite trade has undergone little change—business is not bad, but it could be much better without breaking any records. Stove is in strongest demand, except in Philadelphia, where chest-

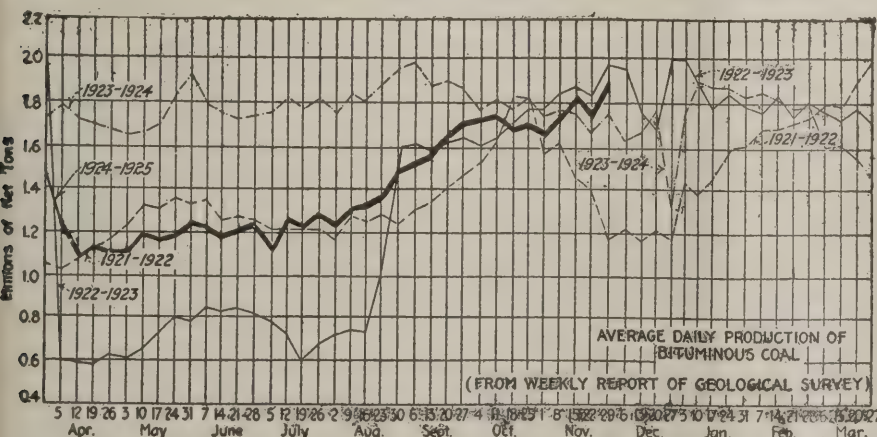
nut is in the van, but egg and pea move only with difficulty. Steam sizes are only moderately active, buckwheat showing a slight improvement. One of the old line companies has advanced the price of stove 25c. and another has tacked on the same amount for chestnut for December. Independent quotations are unchanged except for a 25c. cut on egg.

Coal Age Index of spot prices of bituminous coal holds its gain of a week ago, standing on Dec. 8 at 171, the corresponding price for which is \$2.07, the same as on Dec. 1.

Activity at Hampton Roads registered the biggest increase since the second week in July, dumpings of coal for all accounts during the week ended Dec. 4 totaling 433,722 net tons, the highest of the current coal year. This compares with 299,555 tons dumped during the previous week.

### Bituminous Output Higher Than a Year Ago

Production of bituminous coal during the week ended Nov. 29, according to the Geological Survey, was 9,646,000 net tons, a decline of 913,000 tons from the total for the preceding week, when 10,559,000 tons was produced as shown by revised figures. The decrease in output was due to the Thanksgiving holiday, which was more widely observed than usual in the coal fields. Despite the decline, however, production surpassed that of the corresponding week of last year for the third successive time. Anthracite output also was sharply curtailed by the holiday, the total for the week ended Nov. 29 being 1,611,000 net tons, compared with 1,827,000 tons in the preceding week and 1,691,000 tons during the corresponding week of 1923. Outlaw strikes also continue to limit output.



Estimates of Production		
(Net Tons)		
BITUMINOUS		
	1923	1924
Nov. 15.....	9,717,000	10,129,000
Nov. 22 (a).....	10,160,000	10,559,000
Nov. 29 (b).....	8,943,000	9,646,000
Daily average.....	1,767,000	1,866,000
Cal. yr. to date (c)...	504,371,000	423,191,000
Daily av. to date.....	1,795,000	1,504,000
ANTHRACITE		
Nov. 15.....	1,669,000	1,674,000
Nov. 22.....	2,031,000	1,827,000
Nov. 29.....	1,691,000	1,611,000
Cal. yr. to date (c)...	86,115,000	82,838,000
COKE		
Nov. 22.....	257,000	158,000
Nov. 29 (b).....	245,000	158,000
Cal. yr. to date (c)...	16,886,000	8,766,000
(a) Revised since last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.		



## Midwest Inactive

Mild weather has done it again to the domestic market of the Midwest. There is no heavy buying in any quarter of the region though a snow and sleet storm through parts of Iowa and the Northwest was expected to improve the takings in those territories. The domestic sag has been marked enough to influence steam coal slightly. It is a fact that most big steam consumers are getting a full supply on contracts running the rest of the winter, but small steam trade is paying a shade more than last week.

Pocahontas and anthracite trade in the Midwest is dropping along without high lights and without change in prices. Good smokeless mine run is available at \$1.75 and none of it tops \$2. Lump and egg smokeless is slow at \$3.75.

A little seasonable weather caused a little demand in St. Louis but nothing to create any unusual stir-up. Most orders are small and the demand is mostly for high-grade coal. Country domestic shows a little improvement over the past three weeks. Country steam is slow while local carload is fair and wagonload is good. There are no changes in prices.

## Kentucky Not Busy

The Kentucky coal market hasn't shown any improvement over the week. Prices are a shade weaker, except on screenings, which are in good demand, lighter production, and are commanding steady prices in eastern Kentucky and better prices in western Kentucky. Prepared prices also

have slumped somewhat, the eastern Kentucky market being around \$2.75@\$.3 on best block coals, with a few of the specialty blocks quoted at slightly above \$.3. Western Kentucky 6-in. block worked lower and can be had at \$2.50@\$.275. Lump sizes are around \$2.40@\$.260 in western and \$2.25@\$.275 in eastern, with egg at \$2@\$.250 for western and \$1.75@\$.215 for eastern. Nut is \$1.60@\$.2 in either field and mine run \$1.50@\$.175. Screenings are 85c.@\$.110 for eastern Kentucky and \$1@\$.125 for western.

Colder weather over the week has created a somewhat better demand from the rural districts, where dealers haven't much stock and where farmers buy in hand to mouth lots, or buy late in the season. City retailers as a rule are not buying much replacement fuel.

Gas and electric companies are carrying peak loads and are buying very well and there is a general movement to industrial and heating plants. The brick and cement companies also are unusually busy.

The mines that have opened in the western Kentucky strike zone have not worked up much production and have trouble marketing what they do produce.

## Northwest Trade Is Active

Business has been rushing at Duluth lately, and dock men admit that when the final tally of dock shipments inland for November is in they expect to find the biggest month in two years. It is estimated that at least 27,000 cars left the docks last month. The general tone is optimistic and

## Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern		Market Quoted	Dec. 10 1923	Nov. 24 1924	Dec. 1 1924	Dec. 8 1924†	Midwest		Market Quoted	Dec. 10 1923	Nov. 24 1924	Dec. 1 1924	Dec. 8 1924†
Smokeless lump.....	Columbus...		\$3.75	\$4.25	\$4.10	\$4.00@	Franklin, Ill. lump.....	Chicago.....	\$3.60	\$3.35	\$2.85	\$3.25@	\$3.50
Smokeless mine run.....	Columbus...		2.10	2.00	2.00	1.75@	Franklin, Ill. mine run.....	Chicago.....	2.35	2.35	2.35	2.25@	2.50
Smokeless screenings.....	Columbus...		1.25	1.25	1.25	1.20@	Franklin, Ill. screenings...	Chicago.....	1.70	1.45	1.45	1.40@	1.60
Smokeless lump.....	Chicago.....		3.35	3.85	3.85	3.75@	Central, Ill. lump.....	Chicago.....	3.00	2.85	2.85	2.75@	3.00
Smokeless mine run.....	Chicago.....		1.75	1.85	1.85	1.75@	Central, Ill. mine run.....	Chicago.....	2.10	2.20	2.20	2.15@	2.25
Smokeless lump.....	Cincinnati...		3.50	4.00	4.00	3.75@	Central, Ill. screenings...	Chicago.....	1.45	1.30	1.30	1.30@	1.40
Smokeless mine run.....	Cincinnati...		2.00	1.85	1.85	1.75@	Ind. 4th Vein lump.....	Chicago.....	3.25	3.10	3.10	3.00@	3.25
Smokeless screenings.....	Cincinnati...		1.50	.95	.95	.75@	Ind. 4th Vein mine run.....	Chicago.....	2.60	2.35	2.35	2.25@	2.50
*Smokeless mine run.....	Boston.....		4.50	4.25	4.25	4.00@	Ind. 5th Vein lump.....	Chicago.....	1.65	1.55	1.55	1.50@	1.60
Clearfield mine run.....	Boston.....		1.85	1.95	1.95	1.65@	Ind. 5th Vein mine run.....	Chicago.....	2.50	2.75	2.75	2.50@	3.00
Cambria mine run.....	Boston.....		2.35	2.30	2.30	2.00@	Ind. 5th Vein screenings...	Chicago.....	2.10	2.10	2.10	2.00@	2.25
Somerset mine run.....	Boston.....		2.10	2.05	2.05	1.90@	Ind. 5th Vein screenings...	Chicago.....	1.45	1.20	1.20	1.25@	1.35
Pool 1 (Navy Standard).....	New York...		3.00	2.80	2.80	2.65@	Mt. Olive lump.....	St. Louis.....	3.00	3.00	3.00	3.00	
Pool 1 (Navy Standard).....	Philadelphia...		3.00	2.70	2.70	2.50@	Mt. Olive mine run.....	St. Louis.....	2.25	2.35	2.35	2.25@	2.50
Pool 1 (Navy Standard).....	Baltimore...		2.35	2.30	2.30	2.10@	Mt. Olive screenings...	St. Louis.....	1.55	1.10	1.10	1.00@	1.25
Pool 9 (Super. Low Vol.).....	New York...		2.25	2.10	2.10	1.90@	Standard lump.....	St. Louis.....	2.85	2.75	2.75	2.75	
Pool 9 (Super. Low Vol.).....	Philadelphia...		2.35	2.15	2.15	1.95@	Standard mine run.....	St. Louis.....	2.05	1.95	1.95	1.90@	2.00
Pool 9 (Super. Low Vol.).....	Baltimore...		2.25	1.70	1.70	1.65@	Standard screenings...	St. Louis.....	1.15	.65	1.05	1.00@	1.15
Pool 10 (H.Gr. Low Vol.).....	New York...		1.95	1.85	1.80	1.65@	West Ky. lump.....	Louisville...	3.00	3.00	2.85	2.50@	2.75
Pool 10 (H.Gr. Low Vol.).....	Philadelphia...		1.85	1.75	1.75	1.65@	West Ky. mine run.....	Louisville...	1.70	1.60	1.60	1.50@	1.75
Pool 10 (H.Gr. Low Vol.).....	Baltimore...		2.20	1.55	1.55	1.50@	West Ky. screenings...	Louisville...	1.00	.90	.90	1.00@	1.25
Pool 11 (Low Vol.).....	New York...		1.80	1.60	1.60	1.50@	West Ky. lump.....	Chicago.....	2.85	2.75	2.75	2.50@	2.75
Pool 11 (Low Vol.).....	Philadelphia...		1.65	1.45	1.45	1.35@	West Ky. mine run.....	Chicago.....	1.75	1.55	1.55	1.40@	1.70
Pool 11 (Low Vol.).....	Baltimore...		1.90	1.45	1.45	1.40@							
High-Volatile, Eastern		Market Quoted	Dec. 10 1923	Nov. 24 1924	Dec. 1 1924	Dec. 8 1924†	South and Southwest		Market Quoted	Dec. 10 1923	Nov. 24 1924	Dec. 1 1924	Dec. 8 1924†
Pool 54-64 (Gas and St.)...	New York...		1.60	1.50	1.50	1.40@	Big Seam lump.....	Birmingham...	3.85	3.10	3.10	2.75@	3.50
Pool 54-64 (Gas and St.)...	Philadelphia...		1.60	1.50	1.50	1.40@	Big Seam mine run.....	Birmingham...	1.95	1.70	1.70	1.50@	1.90
Pool 54-64 (Gas and St.)...	Baltimore...		1.85	1.45	1.45	1.40@	Big Seam (washed).....	Birmingham...	2.35	1.85	1.85	1.75@	2.00
Pittsburgh sc'd gas.....	Pittsburgh...		2.55	2.40	2.40	2.30@	S. E. Ky. lump.....	Chicago.....	3.10	2.75	2.75	2.50@	3.00
Pittsburgh gas mine run.....	Pittsburgh...		2.25	2.10	2.10	2.00@	S. E. Ky. mine run.....	Chicago.....	1.85	1.60	1.60	1.50@	1.75
Pittsburgh mine run (St.)...	Pittsburgh...		2.05	1.85	1.85	1.75@	S. E. Ky. lump.....	Louisville...	3.35	3.00	3.00	2.75@	3.00
Pittsburgh slack (Gas).....	Pittsburgh...		1.50	1.15	1.20	1.15@	S. E. Ky. mine run.....	Louisville...	1.75	1.60	1.60	1.50@	1.75
Kanawha lump.....	Columbus...		3.00	2.55	2.30	2.10@	S. E. Ky. screenings...	Louisville...	.75	.90	.90	.85@	1.10
Kanawha mine run.....	Columbus...		1.85	1.55	1.55	1.45@	S. E. Ky. lump.....	Cincinnati...	3.10	2.75	2.75	2.75@	3.00
Kanawha screenings.....	Columbus...		.80	.90	.90	.80@	S. E. Ky. mine run.....	Cincinnati...	1.55	1.45	1.50	1.40@	1.75
W. Va. lump.....	Cincinnati...		2.85	2.55	2.85	2.50@	S. E. Ky. screenings...	Cincinnati...	.95	.95	1.00	.75@	1.15
W. Va. gas mine run.....	Cincinnati...		1.60	1.40	1.45	1.35@	Kansas lump.....	Kansas City...	4.75	5.00	4.75	4.50@	5.00
W. Va. steam mine run.....	Cincinnati...		1.60	1.40	1.45	1.35@	Kansas mine run.....	Kansas City...	3.25	3.35	3.35	3.00@	3.25
W. Va. screenings.....	Cincinnati...		.85	1.00	1.00	.80@	Kansas screenings.....	Kansas City...	2.00	2.30	2.30	2.25@	2.35
Hooking lump.....	Columbus...		2.95	2.55	2.55	2.35@							
Hooking mine run.....	Columbus...		1.85	1.60	1.60	1.50@							
Hooking screenings.....	Columbus...		1.05	.80	.80	.75@							
Pitts. No. 8 lump.....	Cleveland...		2.45	2.30	2.40	2.10@							
Pitts. No. 8 mine run.....	Cleveland...		1.95	1.85	1.85	1.85@							
Pitts. No. 8 screenings...	Cleveland...		1.35	1.20	1.20	1.15@							

\* Gross tons, f.o.b. vessel, Hampton Roads.

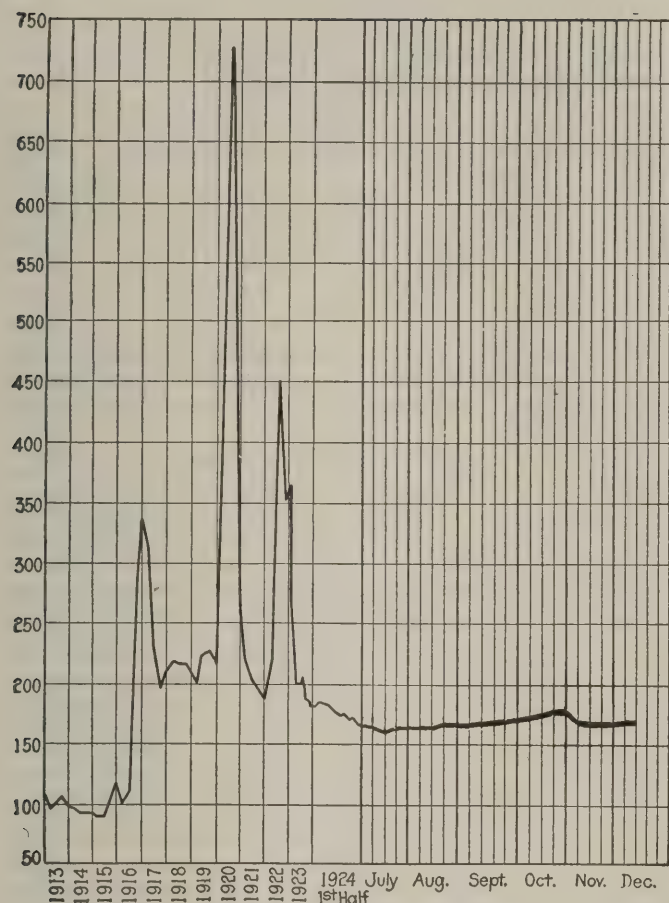
† Advances over previous week shown in heavy type, declines in italics.

## Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

		Market Quoted	Freight Rates	Dec. 10, 1923		Dec. 4, 1924		Dec. 11, 1924†	
				Independent	Company	Independent	Company	Independent	Company
Broken.....	New York.....		\$2.34	\$8.50@	\$10.00	\$8.00@	\$9.25	\$8.00@	\$9.25
Broken.....	Philadelphia.....		2.39			9.15		9.15	
Egg.....	New York.....		2.34	9.85@	11.00	8.75@	9.25	8.75@	9.25
Egg.....	Philadelphia.....		2.39	9.85@	12.20	9.45@	9.75	9.45@	9.75
Egg.....	Chicago*		5.06	9.60@	12.50	8.00@	8.35	8.17@	8.25
Stove.....	New York.....		2.34	9.85@	12.00	8.75@	9.25	8.17@	8.25
Stove.....	Philadelphia.....		2.39	9.85@	12.20	10.00@	10.50	8.80@	9.25
Stove.....	Chicago*		5.06	9.60@	12.50	8.17@	8.25	8.14@	8.20
Chestnut.....	New York.....		2.34	9.85@	12.00	8.75@	9.25	8.75@	9.50
Chestnut.....	Philadelphia.....		2.39	9.85@	12.20	10.00@	10.50	10.00@	10.50
Chestnut.....	Chicago*		5.06	9.60@	12.50	9.15@	9.50	9.00@	9.50
Pea.....	New York.....		2.22	9.85@	12.00	10.10@	10.75	9.15@	9.50
Pea.....	Philadelphia.....		2.14	9.60@	12.50	8.50@	8.64	8.63@	8.75
Pea.....	Chicago*		4.79	9.85@	12.20	8.75@	9.25	8.50@	8.64
Buckwheat No. 1.....	New York.....		2.22	9.60@	12.50	10.00@	10.50	10.00@	10.50
Buckwheat No. 1.....	Philadelphia.....		2.14	9.85@	12.20	9.25@	9.40	8.75@	9.25
Rice.....	New York.....		2.22	9.60@	12.50	8.84@	8.60	8.63@	8.75
Rice.....	Philadelphia.....		2.14	9.85@	12.20	8.26@	8.40	8.26@	8.40
Barley.....	New York.....		2.22	9.60@	12.50	8.44@	8.60	8.44@	8.60
Barley.....	Philadelphia.....		2.14	9.85@	12.20	5.50@	6.00	4.75@	5.50
Birdseye.....	New York.....		2.22	6.00@	7.25	4.75@	5.50	4.75@	5.50
				6.75@	9.00	5.75@	6.00	5.75@	6.00
				6.00@	6.75	5.13@	5.45	5.13@	5.45
				1.75@	3.50	2.00@	2.75	2.25@	2.75
				2.25@	3.50	3.00@	3.15	2.50@	3.00
				1.35@	2.50	2.00@	2.25	1.75@	2.00
				1.75@	2.50	2.00@	2.25	1.75@	2.00
				1.25@	1.50	1.25@	1.50	1.25@	1.50
				1.00@	1.50	1.00@	1.50	1.00@	1.50
				1.25@	1.45	1.40@	1.60	1.40@	1.60

\* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.





Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

Index	1924			1923
	Dec. 8	Dec. 1	Nov. 24	Dec. 10
Weighted average price	171	171	170	180
	\$2.07	\$2.07	\$2.06	\$2.18

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke; 1913-1918," published by the Geological Survey and the War Industries Board.

sales seem to justify the high hopes. There has been little contract business despite the rush.

Insurance rates went off Dec. 1, practically stopping dumping at lower Lake ports. Thirty-four cargoes arrived at Duluth last week, of which only one was hard coal, and twelve are reported on the way, of which three are hard. The arrival of the cargoes now on the way will mark the end of shipments this year, as navigation officially closed for departures Dec. 5.

There is a regular boycott on hard coal at the Head-of-the-Lakes. Consumers buy nearly anything in the soft coal line rather than pay the anthracite price asked. Pocahontas is gone except for the favored few who know the way to the coal man's heart, and other brands of smokeless and semi-smokeless are in demand. The big run reported in the east on Pocahontas has cut down the dock supply.

The Milwaukee market experienced no change during last week. Activity depends upon the weather, which of late has been a little more favorable for dealers in fuel. Only a few more lake cargoes are expected at Milwaukee. Receipts for the year up to and including Dec. 3 total 788,862 tons of anthracite and 2,532,970 tons of bituminous coal—3,321,832 tons in all. During the same period of 1923 the receipts were 958,124 tons of anthracite and 3,204,772 tons of bituminous coal, a total of 4,162,896 tons.

### West Gets Stronger

Signs of convalescence are noticeable in the Southwest, where the market has been suffering from warm weather anemia. As yet the improvement has had slight effect upon working time at the mines, but retail supplies are rapidly diminishing, and within a few weeks operators expect their

mines to be back on a full time basis. The demand for screenings is still disproportionately strong. Kansas screenings are selling generally at \$2.25, with some as high as \$2.35. Arkansas semi-anthracite screenings, which not long ago were offered at \$1, are now quoted at between \$1.75 and \$2. Kansas lump, the list price for which is \$5 a ton, is being sold at as low as \$4.50.

In the Utah coal fields production continues at 60 per cent. Colder weather has stimulated demand for slack for heating purposes. The metal mining industry is the largest consumer of coal among the industrials. Business is improving in most of the territory served by Salt Lake City coal producers beyond the borders of the state. Prices, both retail and wholesale, remain steady.

### Ohio Markets Are Spotty

Complete lapse of lake buying, shrinkage of domestic demand due to occasional mild weather, and the usual disposition of manufacturers to withhold purchases during December, have combined with an oversupply to make the Cincinnati market weak on all grades of fuel except by-product coals, which are in good demand and holding firm. Distress coal is offered at demoralizing prices, congestion is reported at the railroad transfer points and the mine tracks are full of loaded cars waiting for a call for numbers.

Kentucky L. & N. operators have resumed all-rail fuel shipments to Iowa, Minnesota and the Dakotas, their differential having been restored on the postponement of the hearing of the appeal of the C. & O. and N. & W. shippers to be let in on the lower rate and the tactical request of L. & N. shippers for a further cut. The I. C. C. was to have heard the case on Dec. 4, but put it over to January.

Output has fallen off markedly in eastern Ohio, due to cessation of shipments to the lakes and the languid industrial situation. At Cleveland slack and nut-and-slack continue to be scarce and the price remains firm at the high figures of last week. Inquiries for all other grades are very quiet. In the domestic market retail dealers are well stocked, with little disposition to make further commitments until consumers draw more heavily upon these stocks.

Trade at Columbus has been spotty during the past week, especially in domestic, which apparently has been stimulated by colder weather, though there are still quite a few cancellations. Prices for domestic sizes are rather steady at recent levels. Smokeless is noticeably slower although prices have not been reduced. Retail trade has been rather good but dealers have fairly large stocks and in some cases are not yet inclined to replenish them. Retail prices are steady and little cutting is reported. Industrial conditions have improved somewhat, and this has been reflected in the steam demand. Less demurrage coal is in evidence, which has relieved the situation to a certain extent. Production in the Hocking Valley is at about 20 per cent of capacity. Pomeroy, Jackson, Cambridge and Crooksville are doing only slightly better.

### Pittsburgh Market in Doldrums

The Pittsburgh market shows no signs of recovery from the depression which struck it late in October. Shipments of operators to regular consumers are proceeding much as formerly, but there is very little inquiry in the spot market, and demand from all retail dealers is poor. Railroad operations are heavy and industrial operations are moderately heavy. The steel industry is running at about 75 per cent, against 66 per cent in October. Prices are unchanged.

Coal production in the central Pennsylvania bituminous field in November totaled 59,114 carloads compared with 66,792 in October. The drop was due largely to a number of holidays on which the mines were idle. The rate of production was about the same, considering the number of days worked. No bill cars reported at the close of the month were 1,200. Prices range as follows: Pool 11, \$1.70@ \$1.80; pool 10, \$1.85@ \$2.10; pool 9, \$2.15@ \$2.25; pool 71, \$2.35@ \$2.40; pool 1, \$2.40@ \$2.65.

Winter weather has improved Buffalo's coal trade all through. Prices, however, are unchanged, except for slack, which is stronger, some shippers asking 10 to 15c. more for it, due to the closing of the lakes. West Virginia and Kentucky coals, paying much higher freight than any from Pennsylvania, are finding their way here. The movement of all freight, including coal, is still good. The lake trade is about at an end, shipments for the week being only four cargoes, totaling 31,400 tons.



## New England Has Discouraging Outlook

To the steam trade in New England the outlook is anything but encouraging. Not only are prices drooping but there is very little buying interest discoverable in any quarter. Purchases of a few weeks ago are by this time fully delivered and it is likely that there will be renewed accumulations at the Hampton Roads piers. It has long been the practice of smokeless agencies to send coal to tidewater when the Western and line trades slacken, and this season is no exception. What meager inquiry develops is discriminating as between coals. Slack is offering freely, with prices 30@40c. less than mine run of equal grade, but there is so much high volatile slack available that sales are few and far between.

Owing to the dull market and the discontinuance of pool designations Pocahontas and New River mine run coal of recognized grade can be had from \$4.25 down to \$4 flat, and there are rumors of somewhat higher ash coals selling at less than the \$4 level. Off-shore business also is light and coastwise tonnage is falling off as the 60 to 90 day purchases are being filled.

On cars Boston the price curve has dipped in sympathy with going figures at Hampton Roads. High grade smokeless coals are to be had at \$5.25@\$5.50 per gross ton, but sales at the latter level are special or are confined to single carload lots.

All-rail from central Pennsylvania there is no perceptible change. In the always widening territory open to Pocahontas and New River from tidewater there is an ample tonnage of Cambria and Clearfield coals offering at the same low range that has been characteristic the whole season. Dumpings via the New York and Philadelphia piers are light.

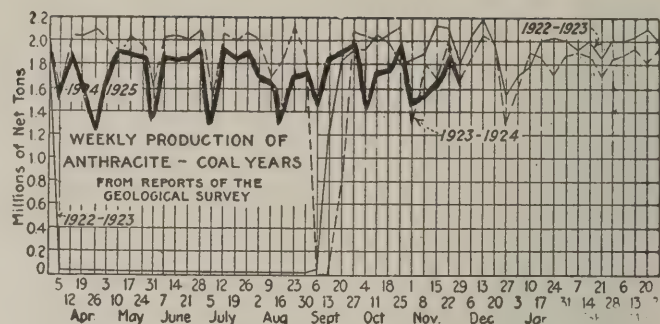
## Buyers Perk Up in Atlantic Markets

Buyers showed more interest in the market at New York last week, but orders were not heavy. The better grades are scarce, as the spot buyer is not willing to take the poorer grades when he can obtain better coals at a trifle higher cost. Contract holders are taking their full requirements, leaving comparatively little coal for the occasional buyer. Although reports show a daily average of about 1,700 cars of coal at the piers at New York there is no distress coal around, shippers being able to dispose of all surplus coal without much trouble.

While demand at Philadelphia is not particularly active, considerable tonnage is moving. Many mines are doing better now than for months past. Railroads are active buyers and their stockpiles are growing. The average consumer, however, is cautious. There are signs of improving trade, and this is giving the buyer more courage to take in more than current requirements. Prices are unchanged.

Demand has not improved at Baltimore, the situation remaining as it has been for some time past, with no change in prices. November proved to be the lightest export month for coal for the present year, falling far behind Novembers of other years.

The trade at Birmingham is virtually marking time awaiting some development to stimulate demand. The recent cold weather was not of sufficient intensity or duration to benefit the wholesale market to any marked extent, and though yards moved considerable fuel to householders in small lots their reserves were not seriously crippled and they are taking on very little coal from the mines. Spot market business is scarce and much solicitation is required to move the domestic production. Steam consumption has



not increased in several weeks past as inquiry from industrial sources has not been up to expectations, the spot supply being absorbed principally by operations of a seasonal character.

## Anthracite Trade Slips Some More

The anthracite market at New York is not as active as it might be. Stove and chestnut move easily but egg and pea are becoming more difficult to move daily. Retailers are prepared to take care of a reasonable increase in orders, as they are well supplied with all sizes except stove. Last week they increased the retail price for stove and chestnut 25c. per ton, making the price in Manhattan \$14.25. No other prices were changed. On Dec. 1 one of the old-line companies increased its price for stove 25c. per ton and another advanced chestnut the same amount. Independent quotations, except for egg, have not been affected by the lull, but a cut in output is expected to affect these coals. There is not much activity in steam coals.

A few cool days in Philadelphia brought retailers actively into the market, but only for a short time. Dealers' demand for nut has greatly strengthened and the call for stove is fairly strong, but egg and pea are slow movers. Steam sizes are fairly well taken, with the demand for buckwheat a bit better than last week.

A real touch of winter at Baltimore has awakened demand for hard coal. There is no scarcity of fuel here, however, and dealers are moving orders promptly. Due to delay in shipment of apparatus, the exhibit of appliances to educate the public in the use of steam coals has been held off for a few days.

The situation at Buffalo is good, but the demand is not large enough to make up the shortage that has existed all summer. The use of the smaller sizes is increasing, as the consumer is finding that he can put in buckwheat for banking at night or for choking down fires that have gone too high and at a cost only a trifle over half that of the regular sizes. The coke trade is light. Some wholesale shippers report a fair trade to certain parts of Canada, but the Buffalo trade does not improve much.

## Coke Market Stiffens

The first quarter contracting movement in Connellsville furnace coke has turned out to be a very remarkable one, totaling about 225,000 net tons a month, and prices advanced sharply during the movement from \$3.25 to \$4 for a recent contract. Apparently all the furnaces now in operation, or definitely scheduled to blow in, such as use purchased Connellsville coke, are covered, but there is some inquiry on the part of idle furnaces considering the question of going in. The sales do not by any means take up the merchant capacity of the region, but they take up pretty well all that can be gotten into operation promptly. The spot furnace coke market in the past week has developed a little demand, recent lots going at \$3.50. Spot foundry coke has been in poor demand, being still quotable at \$4@\$4.50. Heating coke is quotable all the way from \$2.60 to \$3.

## Car Loadings, Surpluses and Shortages

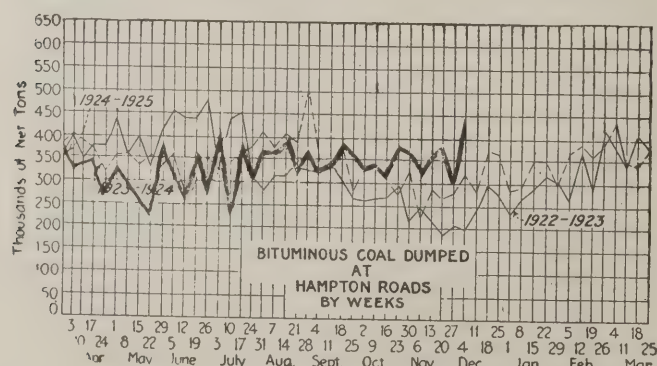
	Cars Loaded	
	All Cars	Coal Cars
Week ended Nov. 22, 1924.....	1,010,122	195,553
Previous week.....	1,015,704	188,229
Week ended Nov. 24, 1923.....	990,217	182,158

	Surplus Cars	
	All Cars	Coal Cars
Nov. 22, 1924.....	166,101	84,367
Nov. 14, 1924.....	145,589	79,111
Nov. 22, 1923.....	111,797	58,490

Car Shortage	
Nov. 22, 1924.....	1,865
Nov. 14, 1924.....	907





## Foreign Market And Export News

### Inquiry Stronger in British Market; Contracting Picks Up

Business is better and inquiry stronger in the South Wales coal markets than for several months. Shipments also have increased owing to a better supply of shipping tonnage. The market still is unsatisfactory and, though some collieries have been able to increase the number of shifts operated, many are still on short time.

The greatest concern to the South Wales operator now is German competition in Europe. German miners are working nine hours a day at a low wage, so that German coal is available at a much lower rate than British. In addition the German operators have opened up depots in South America and Portugal, and are doing their utmost to procure business to an extent which will insure full working time for the German mines. German operators also are offering ship owners sixty days' credit on bunker coal, so that a round trip voyage can be made before

the coal is paid for. In South Wales the collieries ask for payment in seven days, so that the weight of German competition is felt more than ever.

In North England business has been steady since last week, though it is still below normal. Orders for more than 1,000,000 tons of second admiralty qualities have been placed by one factor at about 25s. 3d. f.o.b., but he is now asking a material advance. French railways have booked large quantities over the first half of 1925. Contracts aggregating 70,000 tons of gas coals have been placed at Newcastle, but Germany has obtained the order for 30,000 tons of steam coals for the Lithuanian State Rys.

Production by British collieries in the week ended Nov. 22, a cable to *Coal Age* states, was 5,309,000 tons, according to official reports. This compares with 5,232,000 tons produced in the preceding week.

### French Industrial Coal More Active; House Grades Quiet

Save for a slight improvement in industrial fuel the French coal market continues unchanged. After being more active last week, the demand for house coal is again quiet, due to mild weather.

In the East, supplies of industrial beans are plentiful and competition for business is keen. The marketing of patent fuel is heavy, in spite of further price concessions.

Arrivals from South Wales have been normal of late.

From Nov. 1 to 16, France and Luxemburg received 172,600 tons of indemnity fuel, consisting of 115,500 tons of coal, 38,200 tons of coke, 18,900 tons of lignite briquets, a daily average of 10,800 tons, compared with 28,550 tons in October.

During the first eighteen days of November receipts of indemnity coke aggregated 36,932 tons. Since then,

however, deliveries have recovered their normal pace and arrivals between Nov. 19 and 25 inclusive were 73,035 tons.

### Trade in All Lines but Bunkers Slow at Hampton Roads

Hampton Roads business is dull, with the market weakening and demand dropping off. Foreign trade is at a very low ebb and coastwise movement and bunker trade are barely holding their own.

Inquiries have fallen off and the market lacks stimulus. Domestic business is holding fairly strong in the retail trade, with increasing cold weather having a tendency to hold prices and keep up demand.

The bunker trade alone is being depended on to keep the piers moving at full time. Movement from the mines is regular and considerably above the demand. Very little spot business is being transacted.

### Destination of Fuel Exports from United States in October

	1923	1924
Anthracite.....	400,599	362,118
Bituminous.....	1,488,887	1,534,459
Coke.....	77,737	55,759
Bituminous:		
Exported to:		
France.....	27,045	24,004
Italy.....	59,068	38,418
Netherlands.....	8,876	
Other Europe.....		3,500
Canada.....	1,247,952	1,293,963
Panama.....		24,082
Mexico.....	5,136	6,830
Br. W. Indies.....	10,542	6,364
Cuba.....	52,680	51,358
Other W. Indies.....	21,923	18,771
Argentina.....		14,973
Chile.....	794	
Egypt.....		2,216
Fr. Africa.....		
Brazil.....	31,664	18,228
Other countries.....	23,207	31,752

### Fuel Imports to the United States In October

	1923	1924
Anthracite.....	40,213	6,155
Bituminous.....	89,059	31,643
Coke.....	3,815	6,091

### Export Clearances Week Ended Dec. 6, 1924.

FROM HAMPTON ROADS		
For Italy:		Tons
Ital. Str. Voltorno, for Genoa.....	7,064	
For West Indies:		
Nor. Str. Jacob Christensen, for		
Port de France.....	5,349	
Swed. Str. Freja, for Kingston.....	1,824	
Nor. Str. Bur, for St. Thomas.....	6,319	
FROM PHILADELPHIA		
For Cuba:		
Br. Str. River Taff, for Havana....		

### Hampton Roads Pier Situation

N. & W. Piers, Lamberts Pt.:	Nov. 27	Dec. 4
Cars on hand.....	1,158	1,742
Tons on hand.....	69,545	108,290
Tons dumped for week.....	105,526	147,162
Tonnage waiting.....	13,000	30,000
Virginia Piers, Sewalls Pt.:		
Cars on hand.....	1,840	1,970
Tons on hand.....	123,950	125,150
Tons dumped for week.....	95,128	114,211
Tonnage waiting.....	14,245	2,200
C. & O. Piers, Newport News:		
Cars on hand.....	2,073	1,848
Tons on hand.....	107,490	84,125
Tons dumped for week.....	66,806	125,889
Tonnage waiting.....	7,875	15,715

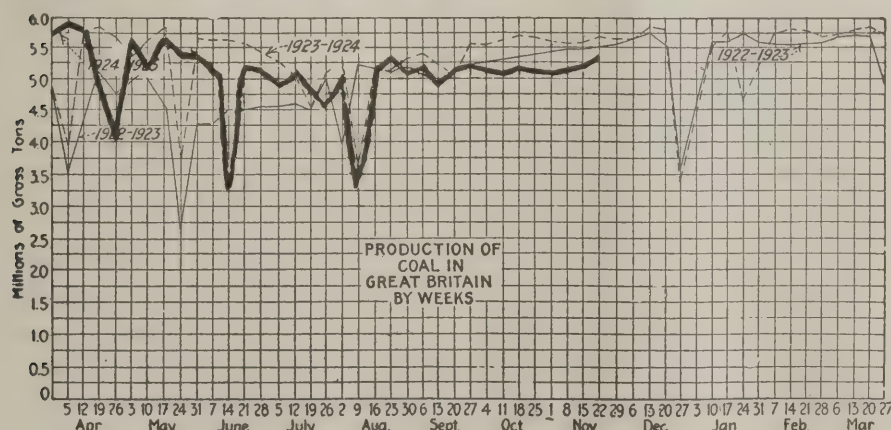
### Pier and Bunker Prices, Gross Tons

PIERS		
	Nov. 26	Dec. 6†
Pool 9, New York.....	\$4.75@ \$4.85	\$4.75@ \$4.90
Pool 10, New York.....	4.40@ 4.65	4.40@ 4.65
Pool 11, New York.....	4.20@ 4.35	4.20@ 4.45
Pool 9, Philadelphia.....	4.90@ 5.25	4.90@ 5.25
Pool 10, Philadelphia.....	4.45@ 4.70	4.45@ 4.70
Pool 11, Philadelphia.....	4.30@ 4.50	4.30@ 4.50
Pool 1, Hamp. Roads.....	4.20	4.15
Pool 2, Hamp. Roads.....	4.10	4.00
Pools 5-6-7 Hamp. Rds.....	4.00	4.00
BUNKERS		
Pool 9, New York.....	\$5.00@ \$5.10	\$5.00@ \$5.15
Pool 10, New York.....	4.65@ 4.90	4.65@ 4.90
Pool 11, New York.....	4.45@ 4.60	4.50@ 4.70
Pool 9, Philadelphia.....	4.90@ 5.25	4.90@ 5.25
Pool 10, Philadelphia.....	4.75@ 4.95	4.75@ 4.95
Pool 11, Philadelphia.....	4.50@ 4.70	4.50@ 4.70
Pool 1, Hamp. Roads.....	4.30	4.25
Pool 2, Hamp. Roads.....	4.20	4.10
Pools 5-6-7 Hamp. Rds.....	4.10	4.10

### Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations by Cable to Coal Age		
Cardiff	Nov. 29	Dec. 6†
Admiralty, large....	27s.@ 27s.6d.	27s.@ 27s.6d.
Steam smalls.....	16s.@ 17s.	16s.
Newcastle:		
Best steams.....	19s.	18s.9d.@ 19s.
Best gas.....	22s.	21s.6d.@ 22s.6d.
Best Bunkers.....	17s.6d.@ 18s.	17s.6d.@ 19s.

† Advances over previous week shown in heavy type declines in *italics*.







## News Items From Field and Trade



### ALABAMA

Reports reaching Jasper are that the De Bardeleben Coal Co. has begun active work on its new \$100,000 coal washer at Empire. It is stated the company will also erect a new modern tipple near the new washer.

The Sloss Sheffield Steel & Iron Co. assumed control and operation of the physical properties of the Alabama Company on Dec. 1, announcement being made that one of the idle stacks of the latter at Alabama City will be made ready for operation Jan. 1. The Alabama Company had active coal mining operations at Mary Lee, Jefferson County, and at Searles and Brookwood, Tuscaloosa County.

Details of the merger of the properties of the Pratt Consolidated Coal Co. with those of the Alabama By-Product Corporation have been worked out, as the consolidation has been approved by the stockholders of the respective companies. The properties will be operated as the Alabama By-Product Corporation with Morris Bush, president; Horace Hammond, A. P. Bush and Carr McCormack, vice-presidents; J. A. Shook, secretary; H. L. Morrow, treasurer; H. M. Cowart, assistant secretary and assistant treasurer. G. B. McCormack is chairman of the board, which is composed of the above officers with the exception of Mr. Cowart and the addition of Erskine Ramsay. No new financing was necessary according to official statement, ample cash being in hand for working capital and such expansion and improvements as may be contemplated for the near future.

### COLORADO

J. B. Marks, purchasing agent of the Colorado Fuel & Iron Co., has been named assistant to President Welborn to take over some of the work performed by Fred Farrar, who recently resigned as vice-president. Mr. Marks continues also as purchasing agent.

A decision was handed down by the State Industrial Commission in favor of the owners and operators of the Morning Glory mine, near Walsenburg, in Huerfano County, in a dispute between the miners and operators as to charges for recharging the storage batteries used for the miners' electric cap lamps. Several months ago a state mine inspector ordered the change from carbide to electric lamps because of gas in the mine. The operators deduct \$2 a month from each miners' pay for recharging the batteries. A number of

workers quit one day in protest, but the next day returned to work after agreeing to submit the matter to arbitration before the State Industrial Commission. The commission held that the charge is fair and reasonable. On a complaint of the miners that the operators had been, in a few isolated cases, changing wages without due notice, the commission also ruled in favor of the employers.

### ILLINOIS

The Fallon Coal Mines Co., of O'Fallon, has been petitioned in receivership by the Security Trust Co., of Detroit. The Belleville Savings Bank, of Belleville, has been appointed receiver. Most of the stock and bonds of this company is owned by Michigan people. The Detroit bank is foreclosing on a mortgage.

The washhouse of Mine A of the Central Illinois Coal Mining Co., a few miles west of Springfield, was destroyed by fire a few days ago, with its contents and with the clothes of the 130 miners employed. A carload of powder was on a nearby siding but the wind carried the fire away from the car.

The Donk Bros. Coal & Coke Co. railroad, the St. Louis, Troy & Eastern, has been purchased by the Illinois Light & Power Co. This road has operated 18 miles of track from Troy to East St. Louis and a 7-mile spur from Edwardsville to Formosa. The purchase also included the Illinois Belt Ry., a small switching line in East St. Louis.

### INDIANA

The Indiana Public Service Commission soon will hear the petition of miners about Blackhawk for a change in miners' train service on the C. M. & St. P. R.R. The case dates back several months when the railroad discontinued operation of the train because of lack of business in the coal industry. Later partial service was restored but the cars of the miners' train, which are left on a siding, are picked up by a passenger train and taken to Terre Haute. The miners say sometimes they are compelled to wait an hour or more for the passenger train.

### KENTUCKY

It is reported that certain political and newspaper interests of Kentucky are starting a fresh fight for a coal tonnage tax to come up in the 1926 session of the Legislature, but a few newspapers are combating the move-

ment and endeavoring to show that the coal business has been in a bad way without any taxes to add to the complications of competitive conditions north of the Ohio River.

C. J. Neekamp, secretary of the Northeastern Kentucky Coal Operators Association, Ashland, was re-elected chairman of the Coal & Coke Committee of the Ohio Valley Shippers Regional Advisory Board at the annual meeting held in Louisville on Nov. 25. At this meeting Mr. Neekamp reported for his committee, and stated that the Kentucky and Virginia section would need more coal cars over the next ninety days than was the case last year.

The Kentucky River Coal Corporation is about to erect a store building in Heiner.

The Hatcher Coal Co., near Pikeville, suffered fire loss of about \$16,000 when the headhouse and part of its chute were burned at night on Nov. 19.

It is reported from Paducah, that the First District Educational Association, meeting there on Nov. 29, after discussion on recommendation of the finance committee, adopted resolutions favoring a state tax on coal, a percentage of the tax return to be paid to the state school funds.

The Gorman-Pursiful Coal Co. is about to let the contract for a store building in Whitesburg, Ky.

The Coil Coal Co., Madisonville, operators, recently contracted the tonnage of the Co-operative Coal Co., at Nebo, effective Dec. 1. The capacity is about 1,000 tons daily.

### MINNESOTA

Announcement was made last week of the wedding of Henry E. Smith, vice-president of the M. A. Hanna Coal & Dock Co., St. Paul, and Mrs. E. H. Windom, of Duluth. The wedding occurred at Dellwood, on White Bear Lake.

### NEW YORK

Net earnings of the United States Distributing Corporation for the two months ended Oct. 31 were \$248,170, against \$133,204 for the two corresponding months in 1923, or a gain of 85 per cent, according to President Harry N. Taylor. "After allowing for the \$192,500 annual preferred dividend requirements," Mr. Taylor said, "these figures indicate annual earnings of better than \$11 a share on the 110,000 shares of common stock of no par value now outstanding."



## OHIO

N. L. Mahan, for many years general manager of the Southern Coal & Coke Co., with executive offices in Cincinnati, Ohio, is now connected with the General Coal Co., Philadelphia, as Western sales manager, located in the Dime Bank Building, Detroit, Mich.

The New York Coal Co., of Columbus, has placed in operation Mine No. 36 at Buchtel, following a shutdown of almost a year. It gives employment to about 150 men. Officials of the company believe that the mine will be operated on full time for the greater part of the winter season.

In the Nelsonville district there are 48 mines operating of which 15 are on railroad fuel. The daily tonnage of the district is about one-fourth normal. Many of the operators say that they are merely holding on and keeping operations going in the hope of better demand in the near future.

## PENNSYLVANIA

The Mid Valley Coal Co., a subsidiary of the Hazle Brook Coal Co., has closed its No. 2 breaker for an indefinite period. It is said to be the intention of the concern to dismantle the breaker and run the coal to the Raven Run operations to be prepared for market. The Mid Valley mine has an output of approximately 800 tons a day.

F. D. Welsh has been appointed superintendent of the Rossiter Mines and property of the Clearfield Bituminous Coal Corporation, of Indiana, Pa., at Rossiter.

Arthur Williams, of Scranton has been appointed superintendent of the Powderly mine of the Hudson Coal Co., at Mayfield. This is one of the largest operations in the anthracite region. Mr. Williams will rank as one of the youngest mine superintendents in the Lackawanna valley.

Newspapers in the anthracite field are carrying reports to the effect that in case John L. Lewis, president of the miners' union, becomes Secretary of Labor under President Coolidge, Philip Murray, of Pittsburgh, will be advanced to the presidency and that a boom probably will be launched to make Thomas Kennedy, of Hazleton, head of District 7 and a member of the Anthracite Conciliation Board, an international vice-president.

E. B. Jermyn, former independent coal operator, has announced himself as a candidate for Mayor of Scranton in 1925.

The American Coke & Fuel Corporation has resumed operations at the Sunshine coal and coke plant, at Martin, Fayette County, after being idle more than a year.

Fourteen workers in mines near Wilkes-Barre, recently were found to possess miners' certificates even though none could show the necessary qualifications. They were immediately directed in court to surrender their papers. Under the Pennsylvania law no anthracite employee can take a test

for a miner's certificate until he has had two years' experience in the industry.

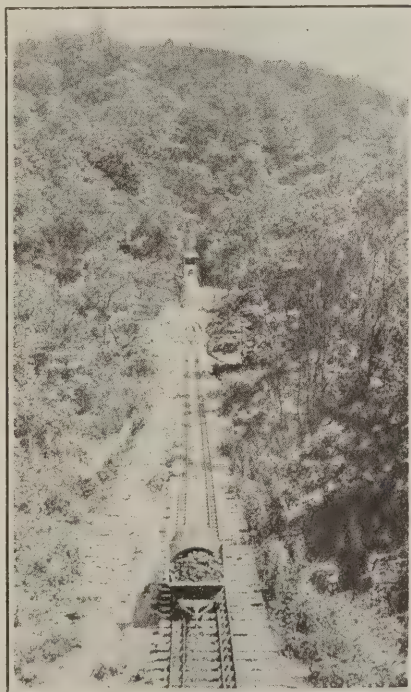
Arthur Etienne, paymaster, and Edward Kelley, mine foreman of the Marion Center Coal Mining Co., Greenwich, Cambria County, were arrested, charged with having "framed" the \$7,000 robbery of the company's payroll, Nov. 28. The police said that both men confessed and that all but \$300 of the loot had been recovered. The authorities said Kelley, disguised, had entered the coal company's office, "assaulted" Etienne and made off with \$7,155. Then, the police said, Kelley walked out of town, removed his disguise and returned home as if nothing had happened.

Charged with violating the state mining law by smoking in a coal mine, Joseph Solgoda of Acosta, Somerset County, was sentenced to pay the costs, a fine of \$90 and serve 90 days in jail by Judge John A. Berkey when he pleaded guilty. The prosecution was brought by Fletcher W. Cunningham, state mine inspector of the Twentieth Bituminous district.

## UTAH

The Liberty Fuel Co., of which George Schultz is superintendent, is building a rescreening plant quite similar to the new one at the Mutual Coal Co.'s mine.

W. H. Homer and Albert Shaw, president and superintendent respectively of the Mutual Coal Co. at Rains, recently completed the installation of a loading boom for lump coal, and a rescreening



Courtesy Bertha-Consumers Co.

### Unusual Gravity Plane at Goucher Mine

Note the force rails that give one the impression that a Barney is used. Not at all! Numbering the rails from left to right the 5-ton loaded monitor in the foreground is running on rails Nos. 1 and 3 and the 5-ton empty monitor in the rear is traveling on rails Nos. 2 and 4. Thus switches but not frogs are eliminated

plant. The loading boom, 48 in. wide, provides facilities for thorough picking. The rescreen consists of a super-capacity continuous elevator, taking the coal from the main shaking screen and delivering it to a set of flexible hanger screens over the bins, each of which has a capacity of 60 tons.

Robert Howard, superintendent of the Peerless Coal Co., has just finished the erection of a commodious nine-room clubhouse at Peerless for the entertainment of officials of the company and others who wish to spend time at the mine. The building is a bungalow with a two-color composition shingle roof. On the main floor are a combination sun parlor and dining room, a kitchen, a hall, six bedrooms, and two baths. In the basement is a recreation room. This clubhouse is considered one of the most attractive buildings in Spring Canyon.

The Rains mine in Carbon County, blown up on Sept. 21, is working regularly again and is producing 1,000 tons a day. Its normal capacity is 1,700 tons, and this amount is expected to be produced after the first week in December, officials stated. The State Mining Department has as yet not issued its report regarding the cause of the explosion in question.

Roy G. Mead and Joel H. Richardson have acquired a lease on 160 acres of coal land in Grand County, following an auction at the State Land Office. They agreed to spend at least \$3,000 on the property and to produce coal commencing with the fourth year amounting to a minimum of 1,600 tons. The government will receive a royalty of 10c. a ton. A premium of \$50 was paid. Messrs. Mead & Richardson are from Los Angeles, Cal.

George A. Storrs, charged, with three others, with fraud in connection with the promotion of the Great Western Coal Mines Co., and under indictment by a federal grand jury, has entered a plea of not guilty in the United States District Court, at Salt Lake City. The defendants were arraigned before Judge Tillman D. Johnson.

## VIRGINIA

The U. S. Shipping Board has awarded to the Willard Sutherland Coal Co. a contract for 1,700 tons of pool 2 coal, for immediate delivery at the Sewalls Point piers at \$3.92 per ton. The figure was regarded as representing a very low market level. The other bidders were Robert Hasler & Co., \$3.93; W. C. Atwater & Co., \$4.04; Dexter-Carpenter Coal Co., \$4.05; W. H. Brown Coal Co., \$4.07; West Virginia Coal Co., \$4.25. The contract figure was not regarded in the trade as indicative of the real market, however, which was held to be nearer \$4@ \$4.10.

## WASHINGTON

Wylie Hemphill, who had been general sales manager of the Pacific Coast Coal Co. at Seattle, has been promoted to the second vice-presidency. He continues as general sales manager also. Mr. Hemphill has just returned from a trip to Europe.



## WEST VIRGINIA

The Morrison Coal Co., owned by the Laing interests and operating mines at Glen Morrison, has presented to its colored employees a church and a lodge hall.

One of the largest store buildings in West Virginia will be opened in the near future by the Pocahontas Fuel Co. at Itmann, just below Mullens. The structure is built of native stone with a garage and warehouse beneath it. The cost of the building and stone wall around it will run well up to \$400,000, it is stated.

Permanent financing of the fourteen-story Coal Exchange Building, in Huntington, has been arranged for. The structure will be completed about Feb. 1. and will cost about a million dollars. S. W. Straus & Co., of New York, have underwritten an issue of \$600,000 first mortgage 6 per cent serial coupon gold bonds, to be secured by the land and the building now in course of erection. A large proportion of the rentable space in the building has already been leased. D. C. Schonthal, A. Solef, M. A. Zeller and H. A. Glick are officers of the building company.

In connection with the effort of the government to collect \$38,653.90 alleged to be due for internal revenue and excess profits taxes from the Knob Coal Co., a subsidiary of the American Gas Coal Co., it has developed that attorneys for the government failed to take an appeal from a decree of sale in the lower court. When an appeal was taken it was only as to the priority of the government's claim for taxes. The Supreme Court ruled that the government did possess the right of priority in its claim for internal revenue and excess profits tax but since there was nothing else asked for, that part of the decision of the lower court ordering a decree of sale was not reversed, so that there is a tangle to be unraveled in the Circuit Court of Monongalia County.

Additional loading facilities are being provided at the Pinnacle mine and the Thomas No. 1 mine, of the Thomas Coal Co. on Crane Creek, by the Norfolk & Western Ry. A new loading track is being installed and existing tracks are being rebuilt. Retaining walls also are being built along the creek bank and the county road right of way in order to prevent a washout in the future such as that which occurred last spring in the Crane Creek section.

Thomas Jones, of Thurmond, has been named as receiver for the New Fire Creek Fuel Co., formerly the Hump Mountain Smokeless Coal Co., of Summers County. Judge J. H. Hatcher, of the Circuit Court of Summers, made the appointment in chambers at Charleston.

Coal companies recently increasing their capital stock were the Kentucky & West Virginia Coal & Mining Co., from \$100,000 to \$500,000; the Superior Harlan Coal Co., from \$250,000 to \$300,000, and the Raleigh-Wyoming Coal Co., from \$4,100,000 to \$4,700,000. The W. H. Green Coal Co., of Elkins,

has decreased its capital stock from \$50,000 to \$25,000.

The Campbells Creek Coal Co. has authorized the resumption of work on the large steel tippie and preparation equipment for the Point Lick mine. This is a new shaft operation and will be one of the largest output mines in the state, the tippie being designed for an output of 600 tons per hour. The complete steel tippie and all equipment is being designed, manufactured and erected by the Fairmont Mining Machinery Co.

The mining town of Yukon, in McDowell County, seat of operations of the Yukon Pocahontas Coal Co., was almost totally destroyed by fire late in November, the loss being estimated at \$100,000. About fifty people were made homeless. The fire, which started in a vacant dwelling near the general store of the company, is thought to have been of incendiary origin. The only buildings remaining after the fire were the company store, one other building and a dwelling.

Orders were received at Gary, operating headquarters of the United States Coal & Coke Co., a subsidiary of the United States Steel Corporation, late in November to increase coal production 5,000 tons per week, it was announced by Colonel Edward O'Toole, general superintendent of the company. A few weeks ago orders for coal were received necessitating the reopening of Mine No. 7, and a little later Mine No. 4 was put in operation.

## WYOMING

The Hellgate Coal Co., a commercial company with headquarters at Denver, Colo., has announced it will soon open its coal properties four miles west of Rawlins. Practically all of its output will be used to supply its Denver trade, though some will be sold to retailing companies outside that city.

It is reported from Corbin that coal trains are moving from there over the Cincinnati division of the Louisville & Nashville R.R. at an average of one every 30 minutes, this coal coming from the big coal companies and industrial mines of southeastern Kentucky, which comes into the division quarters at Corbin. Car supply has been adequate but there hasn't been any surplus motive power, and the Corbin yards have been congested.

## CANADA

A reorganization of the Fundy Coal Co. has been effected. These pits are at Joggins. They have been idle for some time but under the reorganization plans, they will be operated at capacity henceforth. The intention of the new executive is to install new and modern equipment next year that will increase the capacity greatly.

The mines of the Inverness Coal & Railway Co. at Inverness, which have been idle for several months, have resumed operation. As the mines had fallen into disrepair, only 250 men were employed at first, the plan being to enlarge this crew as soon as possible. The management have been able to

interest the miners in a co-operative project, to cut the costs of mining. For the past two years operations in the Inverness mines have been far below capacity owing to inability to show profits. The mines have been closed thrice during that period. According to the management no difficulty is being experienced in marketing the coal.

The Manitoba Department of Public Works has awarded contracts for 36,000 tons of coal for public institutions, the total price involved being \$203,468. This constitutes the bulk of the government requirements until November, 1925. There were in all 57 tenders. Orders for 10,000 tons, 80 per cent of which was from the Souris mines, were distributed among six companies, the prices being for Souris coal, \$3.85; Souris slack, \$3.60; Youghiogheny slack, \$7.34 for delivery on railway siding at Hospital for Mental Diseases, Selkirk. Among the other contracts were these: Capital Coal Co., 6,000 tons of Youghiogheny screenings, \$7.45; Winnipeg Supply & Fuel Co., 5,000 tons Youghiogheny screenings, \$7; Manitoba & Saskatchewan Coal Co., 5,000 tons Souris mine run, \$4; C. J. Sharp & Sons, 3,000 tons Souris mine run, \$4.70 for delivery at Portage la Prairie.

The last week in November was exceptionally busy at the Drumheller mines and, according to indications, many records for daily output and shipment will be broken before the end of the year. On Monday, Nov. 24, 322 cars passed over the Canadian National Ry. scales, being billed to various points in the prairie provinces. This constitutes a record since the mines resumed work in the fall. As a direct result of the increased activity in the Drumheller field, general business conditions are said to be excellent. The pay roll on Saturday, Nov. 22, was \$150,000 which is well above the average for this district.

## New Companies

**The Rio Verde Coal Co.** has been incorporated in Denver, Colo., with a capital stock of \$50,000, by W. D. Waltman, W. O. Gara and M. A. Wogan.

**The Rathbun Coal Co.** has been incorporated in Centerville, Iowa, with a capital stock of \$25,000, by L. B. Harbold and Joseph Swab.

**The McHoma Coal Co.** has been incorporated in McAlester, Okla., with a capital stock of \$25,000, by Egbert D. Buchanan, Roy Caldwell and C. A. Sturgeon.

**Consolidation Coal Lands, Ltd.**, of Coalhurst, Alta., has been incorporated with a capital of 100 shares of no par value to carry on the business of a mining, mineral reduction and development company by Eric A. Lovett, George L. Brockbank, and Thomas C. Boyd.

**Phoenix Coal Co., Ltd.**, has been incorporated with \$40,000 capital and head office in Toronto, Can., to manufacture and deal in fuel. The provisional directors are Grace Cutler, Tavia Shunk and Edible J. Clark.

**Prairie Coal Land, Ltd.**, of Coalhurst, Alta., has been incorporated with a capital of 500 shares of no par value to carry on the business of a mining, mineral reduction and development company by Eric A. Lovett, George L. Brockbank and Thomas C. Boyd.

**The United Bituminous Products Co., Inc.**, New York City, has been chartered at Albany, with \$25,000 capital, to manufacture bituminous products. R. P. Buell, William H. Hall and Max N. Hammerling, 165 Broadway, are the directors and subscribers. Graham, McMahon, Buell and Knox, 165 Broadway, are attorneys for the corporation.



## Traffic

### Short Haul Rate Adjustment Deferred in West Virginia

It has been announced by the Public Service Commission of West Virginia that the proposed adjustment in the short haul freight rate on coal and "coke-in-transit" will not become effective on Dec. 21, as originally fixed, but that the application of the rate had been deferred until Jan. 1. No special reason has been given for the change in the dates but the understanding is that no harm will be done Clarksburg interests by the change. Postponement will not result in a change of the original order, it is understood.

### Rate to East St. Louis Not Likely To Stand

The decision by Judge Crow, at Belleville, Ill., in which a rate to East St. Louis, Ill., of 70c. was made from a group of mines, is looked upon as a joke for the reason that the Judge did not pass on the matter that was presented to him as a whole, but his decision altered that and his action is regarded as rate making, which is beyond the authority of the court. Therefore the application of the low rate is regarded as unconstitutional.

### New York Commission Approves New Fuel Rates

The Public Service Commission of New York has approved a carload rate on coke, minimum weight 40,000 lb., on the Arcade & Attica R.R. from Attica when coming from points on connecting lines to Arcade, Arcade Center, Curriers, Earls, Java Center, Johnsonburg, North Java, Perrys and Varysburg, of 78c. per net ton, effective Dec. 10, 1924. No rates heretofore have been in effect.

New rates of the New York Central (East) on coke in carloads, minimum weight in open cars 50,000 lb. and when in box or stock cars 40,000 lb., also have been approved. Rates per ton from Buffalo, East Buffalo and Harriet to stations as follows: Stafford to Shortville, inclusive, \$1.51; Clifton Springs to Geneva inclusive, \$1.89; Waterloo to Solvay, inclusive, and Corning, \$2.02. Reductions effective Dec. 5, 1924.

The Commission has approved a new joint rate on coal of the Delaware & Hudson R.R. (anthracite, birdseye and bituminous) in carloads from Mechanicville to South Schenectady (on West Shore) of \$1.60 per gross ton, effective Jan. 10, 1925. No joint rate hitherto has been in effect.

## Industrial Notes

The Osgood Company, of Marion, Ohio, announces the appointment of C. J. Thompson as district sales manager in charge of the New York district with offices at 50 Church Street, New York City, effective Dec. 1. Mr. Thompson has had wide experience in the excavating machinery and contracting field.

The Cutler-Hammer Mfg. Co., of Milwaukee, announces the addition to its industrial sales engineering force of the

eastern district of T. E. Beddoe, at one time connected with the Pittsburgh and Chicago offices of the company. He is now located in the Philadelphia office. Paul Darlington, for the past four years in the industrial controller engineering department at the Milwaukee factory, has joined the New York staff.

Foot Bros. Gear & Machine Co. recently completed arrangements with Chas. Bond & Co., Philadelphia, Pa., for the distribution of its IXL gear products and speed reducers in eastern Pennsylvania and Maryland, the state of Delaware and all of New Jersey south of Mercer County.

The Hyman-Michaels Co. of Chicago, due to its expansion in the railway equipment field, has engaged the services of F. W. Glauser, formerly associated with the Mid-Continent Equipment & Machinery Co., of St. Louis. Mr. Glauser will be located in St. Louis, where he will assume the management of the equipment department for the Southern territory.

The Central Steel Co., of Massillon, Ohio, manufacturers of Agathon alloy steels, announce the appointment of A. B. Cooper as their Philadelphia district sales manager with offices in the Widener Building. Mr. Cooper has been identified with the steel industry for 17 years in both operating and sales work and is well known in the Philadelphia territory, where he was formerly identified with the Tacony Steel Co. and the Penn Seaboard Steel Corporation.

## Obituary

Henry P. Adams, well known in the coal industry of southern West Virginia, died late in November at his home near Lynchburg, Va. Mr. Adams was for more than 20 years City Treasurer of Lynchburg but resigned that post a few years ago to devote more attention to his rapidly growing coal interests. He became president of the Ivy White Ash Coal Co., operating at Ivaton, W. Va. He also was vice-president of the Pinnacle Block Coal Co. as well as vice-president of the Imperial Coal Sales Co. of Lynchburg, Va. Surviving him are a wife and three children.

Evan W. Evans, 55, well known mining expert, died Nov. 27 at his home in Scranton following a ten-days' illness that developed into pneumonia. Mr. Evans was for many years mine foreman of the Capouse colliery, of the Scranton Coal Co. He was born in Scranton and began his career as an employee in the coal breaker. While engaged in this work he studied at night, eventually becoming a recognized anthracite authority. He also organized a mining school in West Scranton for the instruction of eager students of limited resources. His course was finally adopted by the Y. M. C. A., and there he continued to help those who desired to prepare for state examinations for mine foremen and superintendents. Surviving him are his wife, four daughters and three sons.

While taking lunch at the Macdonald Hotel, Edmonton, Alta., on Thursday, Nov. 27, Louis Pratt of Montreal, president of the Coal Valley Mining Co., collapsed and died within a few hours from heart failure. A close friend of Premier King, Sir Henry Thornton and other big men and himself a prominent financier in eastern Canada, Mr. Pratt was well known in coal circles. At the time of the fatal seizure he was luncheon with C. E. Berry, his co-director of the Coal Valley Co., with whom he had been spending a few days investigating mining conditions in Alberta. The remains were forwarded to Montreal for burial.

## Coming Meetings

West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers. Fourth annual convention, Dec. 12 and 13, Huntington, W. Va. Secretary-Treasurer, Herbert Smith, Huntington, W. Va.

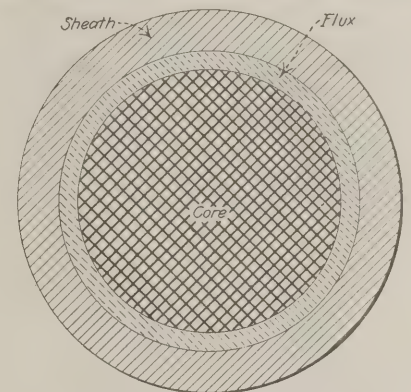
American Institute of Mining and Metallurgical Engineers. Annual meeting, Feb. 16-19, 1925, 29 West 39th St., New York City. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

American Institute of Electrical Engineers. Midwinter convention, Feb. 9-13, 1925, 29 West 39th St., New York City. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

## New Equipment

### Self-Fluxing Electrode for Welding Cast Iron

The type A welding electrode is a product of extensive research by the General Electric Co., and it differs radically from other electrodes in its make-up and characteristics. It is a fluxed electrode having a construction that protects the flux from dissipation. The clean metallic surface renders it adaptable to automatic welding equip-



### Flux Combined with Rod

The action of the flux is to assist the deposition of metal and also to prevent oxidation and nitrification. The proper quantity of flux is always applied because it is fed with the welding rod.

Its outstanding features are: Arc stability, ease of manipulation, rapid deposition, good penetration, sound tough welds, and economy. The electrode consists of a central metallic core surrounded by a layer of flux, which is protected by a metallic sheath.

Arc stability, is obtained by the use of a special flux. By a unique construction, this is included within the body of the electrode, being inclosed between the metallic core and the sheath. This prevents loss of the flux in transit or during welding and insures the presence of the correct quantity at the arc.

On account of the stability of the arc, it is easy to "strike" and to "hold" it. This makes it easier to make a good weld, because it permits the operative to concentrate his attention on other features of the welding operation. The training period of operatives is greatly reduced, and those who are already trained are able to do more and better work with less fatigue.

Rapid deposition is possible because the stable confined arc concentrates the heat at the point where it is needed, and hastens the rate of melting at the arc. The electrode can be used on either alternating- or direct-current systems.

The metal of the electrode can easily be made to penetrate effectually the metal being welded. The arc presents the minimum area of exposure to the surrounding air, thus restricting the opportunity for oxidation and nitrifi-



cation, which are most active around the borders of the arc. Sound, tough welds result from this restriction of atmospheric action. Moreover, the flux is a scavenger for oxygen and nitrogen and carries them out in a thin layer of slag. This slag further protects the deposited metal while it is cooling.

Maximum economy is obtained owing to the increased speed with which the weld is made, the more rapid deposition of metal and the fact that the operative can apply himself continuously to the work without fatigue. Other sources of economy are the reduction of power consumption, the smaller quantity of electrode metal necessary to make the required weld, and, most important of all, the better quality and greater reliability of the weld.

The welding electrode is supplied in diameters of  $\frac{3}{8}$ ,  $\frac{1}{2}$ ,  $\frac{5}{8}$  and  $\frac{3}{4}$  in. The  $\frac{1}{2}$ -in. size is furnished in 22-in. lengths and in approximately 200-lb. quantities on reels. All other sizes can be supplied in either 14-in. lengths or on reels containing approximately 200 lb. The short lengths are furnished in 50-lb. bundles covered with heavy burlap and securely fastened with a steel tape.

### Shock Absorber and Flexible Coupling Combined

Extremely simple in design is the new flexible coupling of the pin and bushing type introduced by the Terry Steam Turbine Co., of Hartford, Conn. The materials used in its construction have been selected with care and have demonstrated their fitness under actual working conditions.

The flanges are machined all over and are made from special composition steel forgings. Steel is used in preference to cast iron because of its greater uniformity and higher tensile strength. One of the most common faults of other couplings of this same general type is that they are constructed of cast iron. Castings are seldom uniform in density and free from blowholes. Lack of uniformity results in very low tensile strength, and makes it difficult and sometimes impossible to obtain correct balance. Both of these items are of major importance on relatively high speed, as well as on moderate speed apparatus where centrifugal force is an important factor.

The pins are also made of steel. To assure a smooth surface and long life, the cylindrical portion of the pins are hardened and ground. In this way the bushings are free to adjust themselves

under load and are prevented from transmitting end thrust. The pins are provided with screw heads and fibre washers which keep the bushings in their proper location within the driven flange. They may be removed readily with an ordinary wrench.

The bushings, which are the flexible medium, are made from a uniform grade of rubber that has demonstrated its ability to withstand hard usage. They are fastened securely to flanged steel spools which fully protect the ends and inner surface from wear. The rubber is ground to an exact outside diameter so that each bushing transmits its portion of the load. Since there is no chance of the bushings working into the space between the flanges they cannot become enlarged or transmit any axial motion.

#### BUSHINGS EASILY REPLACED

All parts of the coupling are made to limit gages, which assure accuracy and perfect interchangeability. Should the bushings need replacement, due to a large amount of misalignment, it easily can be done without any fitting whatsoever. The holes in the flanges are drilled and reamed with accurate jigs so that the pins are equally spaced and parallel to the axis of rotation.

Although every precaution is taken to insure uniformity of the flange forgings, very slight differences in density are unavoidable, therefore, the coupling is balanced after it has been finish machined. This prevents vibration set up by the coupling. Vibration would lead to wear and rapid deterioration of the connected apparatus or cause it to operate badly.

Aside from the excellency of the materials and the care used in the manufacture of the coupling, it possesses certain features which make it particularly desirable for all classes of service. Briefly its advantages are as follows: It compensates for both angular and off-center misalignment; it allows free end float of the connected shafts and will not transmit end thrusts; no special tools are required to disconnect it; by removing the pins, the shaft of either machine may be raised vertically without disturbing the other; it is easily and quickly checked for alignment; the driving flange is provided with a lip to protect operators; it does not depend on metal strips, rubbing surfaces, or any other unreliable medium for its flexibility; it requires no lubrication; it has a tendency to prevent the transmission of shocks; it acts as an insulator between the two machines, and, it is designed to

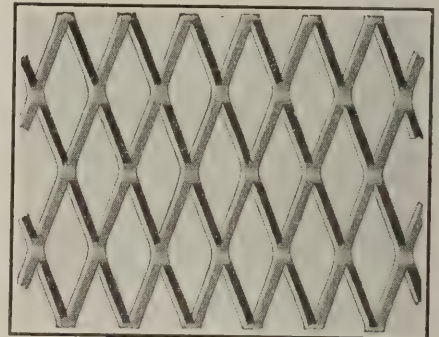
to operate in either direction of rotation.

The ratings which are assigned the flexible coupling are conservative and are based on many years of experience. Couplings are available in capacities up to 400 hp. per 100 r.p.m. In all cases it is rated so as to give maximum life and minimum wear. Generally speaking, it is stronger than the shafts on which it can be mounted.

The coupling is suitable for use with such equipment as steam turbines, electric motors and generators, fans, pumps, reduction gears, coal pulverizers, line shafting, etc.

### Expanded Metal Screening Withstands Vibration

A screen, which comes in stiff flat sheets and with edges clean-cut on both sides, has recently been developed by the Northwestern Expanded Metal Co., 407 S. Dearborn St., Chicago, Ill. This screening retains the strength of a steel plate without, however, its disadvantages of weight and bulk. Unlike most



Section of Expanded Metal Screening

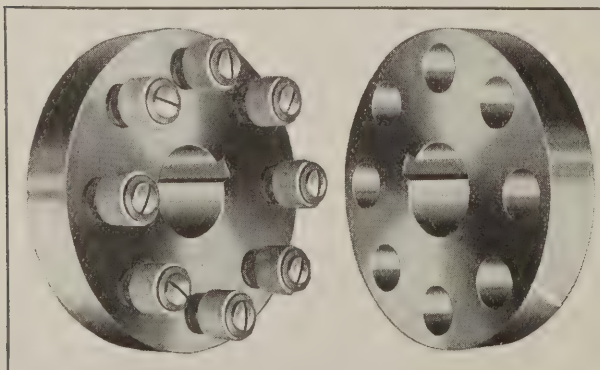
There are no joints to become loose and thus cause the screening to unravel in this sheet of expanded metal.

guard fabrics it will not loosen up and sag even when subjected to a continual vibration and the mesh cannot unravel under handling or when being cut away. A blow or other accident may dent or possibly fracture a strand, but the injury is localized and will not spread or impair the general efficiency of the guard. Repairs can be made easily and inexpensively and openings cut at any point. The general rigidity of the expanded metal permits a wide spacing of supports.

#### SOON PAYS FOR ITSELF

A properly constructed, well-fitted guard made from this material will pay for itself in a surprisingly few years. On the other hand, a poorly built or flimsy guard is a constant expense, a nuisance, and also an added hazard, because it implies a protection which actually does not exist.

In the manufacture of this screening, sheets of medium open hearth steel are cut and expanded to form a fabric of diamond shaped meshes. The diamonds are formed by short sections of the original unsheared plate, and hence not dependent upon mechanical joints of any kind. The low carbon steel and cold rolling process of manufacture makes it a very tough, high elastic limit material.



Misalignment Corrected

A flexible coupling which does not create strains. Even the rubber bumpers are so designed that they cannot exert end thrust. The steel plates are accurately faced in order that they may be easily aligned.



# COAL AGE

McGraw-Hill Company, Inc.  
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Devoted to the Operating, Technical and Business  
Problems of the Coal-Mining Industry

R. Dawson Hall  
*Engineering Editor*

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## Watching Our Opportunities

IN ENGLAND the coal market apparently is getting a bit restive because the conservative party was able to resume the reins of government. "Sooner or later," says a letter from a large English jobbing house to a list of American coal producers, "the new conservative government is going to get into trouble with our miners." If that time comes English coal production may be expected to be shut off again with consequent effect upon the importation of coal by England. This prospect adds another reason for the firm retention abroad of the trade representatives of the Department of Commerce. When there is any foreign economic disturbance either in prospect or in process this country needs to have a keen eye and ear on the spot.

## Pooling Brains and Experience

COAL COMPANIES, especially those in the anthracite region, do not arrange that their engineers and other workmen have sufficient opportunity to associate together and learn one from the other. One coal company official claims that the managers get together and interchange views on their various problems and go back to their offices and carry out their plans.

If this is all they do, it is easy to see why one company is highly developed along some lines of electrical application and a laggard along many others. When engineers themselves do not know what the other fellow is doing and cannot see where they themselves are progressive or unprogressive, how can they grasp the second-hand or third-hand information which may be transferred to them through official channels?

The electrical engineer has too hard a task today making his own president or general manager understand the problems pertinent to his own organization to hope to acquire information from another company by indirect methods.

A good live society is needed, and the coal companies themselves should encourage its formation.

## Fumbling at the Knot

COLLEGES and universities still fumble at the knot. If they want to train practical men, they must get men of practice in their college faculties. They must select electrical engineers who have worked at the bench, on the road, in the mine. They must get mining engineers who have designed and erected tipples as mining-company employees or as manufacturers' representatives. They must get as mechanical engineers men who can design and construct hoists, who can go into the factory or the boiler shop and take charge.

That requires money. That involves a reconstruction of staffs. Colleges are today too frequently merely bricks, marble, and stark intellect. Our industrial colleges should be built on the right kind of brains, on men who have an industrial knack, rather than an

intellectual afflatus. Too often college heads have gone the rounds looking for men at knockdown prices. They choose clever young men for fellowships it is true, who are good experimenters perhaps, but are failures as executives, designers and operating officials. Some day we may learn that the kind of talent that colleges must seek is talent that will sell, that commands a high price in the market.

The colleges must enter into competition with industry on equal terms, and when a college sees a man in the forefront of industrial progress it must offer him a salary that will lure him to the classroom. There is no other way of cutting the knot with which so many colleges are still fumbling. They get what they pay for, and the colleges do not grow. They become centers of research and of elementary education but not training schools for the higher walks of industry. Today young men must go into an apprenticeship in the shops and in the mines where they can be placed under talent of a kind which the colleges cannot attract because they are unwilling to pay for it. Let us hope that the collegiate atmosphere will come closer year by year to that of the mines, the mills and the factory and that of the millions given to educational institutions more will be spent in the endowment of adequate faculties. The glory of a college is not in its buildings but in its staff and in its students. Let that never be forgotten.

## What Makes for Stabilization?

STRANGE is the reasoning of those who would stabilize the coal industry. They tell us there are too many bituminous miners, and so there are; altogether too many. Those who question that statement are men who for their own personal advantage want to increase or at least maintain production. But there is too great a mining capacity already; so their contention is at fault.

What the stabilizers overlook is that the present wage is too high. If it were lower the excess of mine workers would automatically correct itself as it does in other industries. So long as wages are sustained by the same persons who desire to reduce the number of mine workers there cannot be any correction of the present situation. Where men can get \$7 to \$15 a day it is not likely that they will leave the industry permanently. Slow runs and short time may temporarily deplete an industry with such a wage rate—whether it will, is questionable—but it will not permanently reduce the number of men engaged in it. They will come back as soon as there is a demand for their services and even before they can be assured steady work. Lower wages will cure the excess and indeed little else will do it, except a restriction of the entrance of new blood into the industry by requiring previous experience in the mines. This latter course makes work in the mines a monopoly, and that surely is undesirable.

In most other industries, with the notable exception



of railroading, the wage is determined by supply and demand. Consequently when the demand is low, the supply falls off. In the coal industry when times have been bad and work has been irregular, the wage is raised by a fiat of the Administration and of the public. Thus the miner is compensated for his past idle time, and the wage is pushed further up above the normal rate; this is crystallized by an agreement. More men enter the industry. Business declines, and the miner soon suffers from short time.

When times improve he asks for more wages to compensate for the short working hours of a previous year. Again he gets an increase, and again more men enter the industry. It is a vicious circle. We get nowhere by adopting the plan of giving a yearly wage to the miner. We make it necessary to pay ever more and more. It makes more idleness, more discontent. The wage that is given makes a higher wage more necessary. The path we are treading leads ever to a more aggravated condition of a deplorable evil.

More men means large mine capacity and more mines; so that the other evil, too many mines, follows in the same train. Figure the miner's wage per day and not per year, and conditions will right themselves. An uneconomic theory is bearing the industry fast to the rocks of over-manning and overdevelopment, and the stabilizers should realize that fact. But politics makes it necessary to talk stabilization and high wages in the same breath, and who will say that the one does not negative the other? The stabilizers do not know whether they are singing bass or soprano.

### Line Up with the Best

WHAT a confusing babel of sounds one can expect to hear when the United Mine Workers' officials get together to plan legislation to curtail the use of electricity in the mines, as they have declared it their purpose to do at their recent meeting in Harrisburg.

In the anthracite region many companies do not know what the others are doing, electrically. One large company may pride itself upon its power plants and extensive use of electricity, yet be far behind another and a smaller company that has put more brains into its work. Each company has relied too much on its own ability to think out and devise new plans, and as a result is in some ways far behind others in the safe use of electricity.

The electrical hazards found at some mines are real and many. There are breakers which have no electric lights but instead use open-flame oil lamps with their ever-present fire hazard. Well-lighted shaft bottoms greet you in some mines whereas others are dark and damp death traps. At some mines only 440-volt motors are used, but they are installed in such a manner that they are more dangerous than the 2,300-volt motors at another mine.

Crooked and twisted trolley wire supported on old-type hangers which leak and cause the trolley wire to sputter sparks on powder cans, hay and feed have taught some companies serious lessons. Open-type circuit breakers instead of closed types have caused dangerous flashes. Sectionalizing trolley switches left closed during the night have been responsible for mine fires. Leakage currents in hoisting cables and pipes have shocked the workmen.

In every anthracite mine some of these hazards have been guarded against, but others have made no provision against them. Despite the need for concerted

effort the coal companies have never met to formulate definite practices that would assure safety.

Perhaps the greatest difficulty of all lies in the fact that the mine foreman and not the electrical engineer supervises the work of the men in the mines who maintain, operate and repair the electrical equipment.

### Your Place in the Coal Industry

A CERTAIN large operator had several mines in an excellent coal seam and under that almost unequalled bed lay two or three more beds of coal, above the average, it is true, but not equal to the first. Did he mine these latter? Not at all. He mined out the best coal and looked around for more.

He thought that he had found a good deposit and opened a mine in it, spending a million dollars before he got a single pound of coal. It will be remembered that in those earlier days a cool million was regarded as a tremendous sum. He found, however, that the coal he got from his new venture was fast injuring his reputation. It was altogether too volatile and had too much ash. He could have continued to sell it for what it was, a coal of medium quality, but he could not prevent it from lowering his standing in the market. Even had he organized another company to work the coal and sell it, there always would have been the assurance that the story would leak out that he was the principal owner, and the sale of it would injure the excellent reputation he had acquired of marketing nothing but the best, so he sold the mine to other operators who could well afford to ship such coal, seeing that they were already producers of coal of only medium quality and traded in a less discriminating market.

About the same time he purchased another field having a seam of excellent coal. Above the bed he bought was another containing a coal of equally low volatile content, but it had more sulphur. He did not buy that bed, however. He was determined to mine nothing but the best.

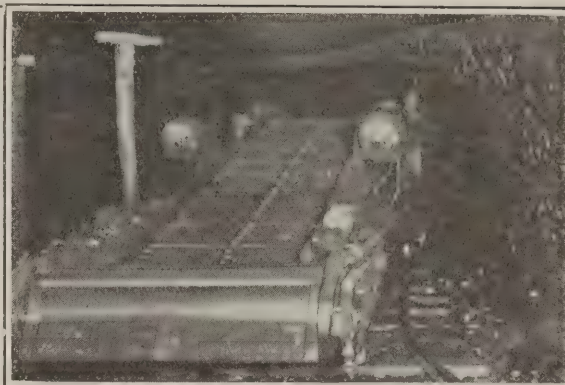
In time the coal seam in the area in which he first operated was exhausted, and he leased out the other seams below it. These seams had fairly good coal, as has been stated, but he would not work them. They would have injured his reputation. He concentrated his efforts on the good seam in the new area he had purchased and developed. Now he is making an analysis survey of this good seam so that he can mine the best of it, and leave the rest.

The time may come when he will have to work what he is rejecting. Some time he may have to mine this less desirable coal or perhaps may have to establish himself where the coal is still lower in heating value. But he will maintain his standing by mining the best that is obtainable. To do otherwise will mean that he will be obliged to class himself with those who are producers of only fairly good coal. He may wash it and table it, but it is likely that it will never be as good as that which he is now selling. However, he will see to it that it is still the best on the market.

The moral is short and pithy. Do not go to the market with all kinds of coal for all comers. Specialize on one kind of coal with preference for the best. Some of the present consolidations may not have been formed with this simple rule in mind. If a man is known to have a good and an only medium coal, his customers will be wary of buying from him, for they will hear on one side of his higher price and on the other side that his coal is not of first quality. Standardize, therefore, standardize!



# Machine Loads 377 Tons Into 2-Ton Cars In 8 Hours From Room Workings



*Traversing a Crosscut*

**Average Production of Machine for a Month, 289 Tons—Crosscut Turnouts and Two Car-Shifting Locomotives Facilitate Loading—Big Car Advantageous—Pillar Coal Is Being Loaded Mechanically**

BY ALPHONSE F. BROSKY  
Assistant Editor, *Coal Age*,  
Pittsburgh, Pa.

**T**HAT LOADING machines can be applied successfully to room-and-pillar mining is being convincingly demonstrated at a mine in northern West Virginia where substantial increases in the daily output per man employed and important savings in the cost of production have been made. Even so, what is being accomplished is only of an experimental nature intended to serve as a guide in the planning of future mechanized developments.

Impressed with the possibilities of saving in the labor of coal loading by the use of machines, the Pittsburgh & Erie Coal Co. procured an Oldroyd loading machine for use in its Sumner No. 2 operation. This mine is located at Braznell in the Monongahela district of Pennsylvania. What the company desired to ascertain was the exact degree to which the theoretical possibilities of loading machines could be realized.

This loader was put to work in the thick Pittsburgh bed under conditions that could not by any means be considered favorable. Sumner No. 2 is an old and almost exhausted operation. No block of coal of adequate size for experiments in mechanical loading could be found in it, and for this reason, tests of the machine's loading ability were somewhat desultory and inconclusive. It was soon discovered, however, that even in the Pittsburgh bed, with its troublesome draw-slate, loading machines possess more than mythical advantages. Upon one occasion the machine succeeded, during an 8-hr. shift, in loading 250 tons of coal into mine cars of 1.6 tons capacity.

## NEW AND MORE PROMISING FIELD PROVIDED

Desiring to continue the experiments where they were discontinued, but under conditions similar to those prevailing at the Sumner No. 2 operation, the Pittsburgh & Erie Coal Co. closed negotiations for the privilege of mechanically loading coal in a small section of the Robert mine near Clarksburg, W. Va., this mine being owned by the New Superior Coal & Coke Co. Incidentally it may be said that during the recent war an attempt was made to produce coal in this property

Although the loading machine shown in the headpiece is 45 ft. long it is built in three sections or segments and as may be judged from the illustration no difficulty is experienced in taking it through crosscuts. These passages, however, are driven on a 45-deg. angle and the track curves have 35-ft. radii.

by stripping. This, however, failed because the cover, which ranged from 40 to 75 ft., was too thick for ordinary stripping equipment.

Machine loading in the Robert mine under the supervision of T. F. Whalen, general superintendent of the Pittsburgh & Erie Coal Co., began about the middle of July of the present year. Some time was required, however, to prepare the sections and make the changes necessary for the introduction of machine methods, and it was not until the latter part of August that the work approached the production stage.

During twenty-four 8-hr. shifts worked in September, one machine loaded 6,058 tons, or an average of 252 tons per day. Twenty-four men including a mine foreman, mined, shot, loaded and transported all this coal from the face to the railroad car. The daily output per man employed was thus 10½ tons. The results achieved during 17 working days of October, however, were far better. During this month the same number of men with one loading machine produced an average of 289 tons per shift, or a daily output per man of 12 tons. Even this performance is scarcely indicative of the machine's possibilities, for on one day the crew mechanically loaded 377 tons of coal.

The Oldroyd machine used at this plant is 42 ft. long and weighs 22 tons. Although its over-all height is 54 in., it can operate in a 5-ft. coal bed. It travels upon, and works from, the mine track, its massiveness of construction enabling it to push itself under loosened coal and thus to break out hanging shots. The machine is not only powerful, but it has also a reach that enables it to gather in the coal from the entire face without leaving the track. It is equipped with three conveyors, the middle one being fixed to the body, while the front and rear sections swing in either direction, horizontally as well as vertically. Both motions can be made simultaneously.

## TWO CUTTER CHAINS DRIVE LOADING HEAD

Coal is fed into the forward conveyor by means of a revolving dipper. This consists of a roll of small diameter on which are cast two plate paddles spaced 180 deg. apart. This feeding device is driven by two cutter chains provided with pick bits which cut a path in the coal pile for the bearings as the machine



advances. The main body of the loader is supported by two sets of swivel trucks which enable it to round curves with ease.

Five motors are utilized to give independent yet correlated movement to the various machine elements. As far as possible, chain drives have been eliminated, transmission being made by means of gears and worms.

Two men operate the machine. One controls its forward movement, the starting and stopping of the dipper and the swinging of the forward boom. The other starts and stops all three conveyors and controls the position of the rear boom. This two-man control is analogous to that of the ordinary steam shovel.

The layout of the Robert mine where this machine is employed is shown in Fig. 4. Rooms are driven 400 ft. long and 20 ft. wide on 30-ft. centers. They are necked on a 45-deg. angle in order to provide a turnout of greater radius than is normally provided for gathering locomotives. This is necessary to facilitate movement of the loading machine. For the same reason crosscuts are turned on a 45-deg. angle in one direction only. The inby crosscut, placed at a convenient distance from the room faces, is tracked to



Fig. 1—Loading Machine Used in Robert Mine

In this illustration the loader is in working position at the end of a coal pile. Inasmuch as this machine operates from a track the span of unsupported roof is only slightly greater than the depth of cut plus the track gage.

expedite haulage and to permit of the movement of the loading machine from one room to another without the necessity of traversing the butt entry. As a matter of fact, only one of the crosscut turnouts is of sufficient radius to enable the loading machine to pass between the rooms thus connected. It is the intention to install turnouts of 30- to 35-ft. radius equipped with a No. 2 frog.

The track is laid up the center of the rooms. On each side of this room track is set a row of props on 5-ft. centers. The coal is cut to a depth of 8½ ft. at a height of 6½ ft. above the floor, leaving 1 ft. of top coal to protect the roof. Fig. 6 shows a circular cut being executed by an Oldroyd Universal machine which also shears the coal in the center of the face. One long shothole on either side of the shearing cut and one short hole in each rib are employed to break down the coal.

#### HEAVY SHOOTING ASSURES EASY LOADING

In this mine, shotholes are charged rather heavily for two reasons: First, the coal on reaching the outside must be carried to a railroad siding on the farther bank of a stream by an aerial tramway, the buckets of which are too small to hold large lumps. Second, the circular cut made by the mining machine in a width of 20 ft. leaves two tight corners, which require two light rib shots.

Satisfactory shooting for mechanical loading presents problems all its own. In this particular mine,

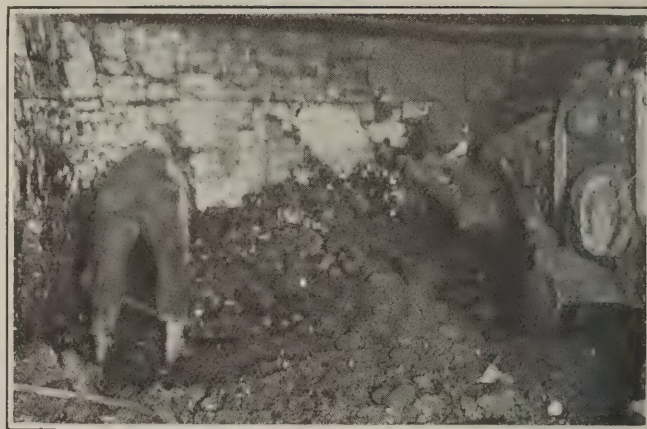


Fig. 2—Breaking Down a Hanging Shot

Rugged construction and massive weight enable the machine to disrupt masses of standing coal as shown. Though this process is slower than shoveling loose coal from the mine floor it affords a coarser product. The hand shoveler seen in this illustration saves the machine much time by gathering up stray pieces of coal that the machine could reclaim only with difficulty.

as has been stated, the coal is undercut and center sheared to a depth of about 8½ ft. The two light rib shots already mentioned are sufficient to bring the coal away from the sides and roof, but they do not break and roll it out on the floor. They result rather in a true hanging shot, most of the coal remaining in two blocks upon either side of the shear cut. These are broken away from the roof and show some evidence of a slight separation and movement along the cleavage planes.

An attempt to load out these blocks shows that this apparent shattering does not extend throughout the entire mass, as certain portions stubbornly resist, although they finally succumb to the powerful action of the revolving dipper. This shooting, however, gives a product with a low percentage of slack, the quantity of coal less than ¾ in. in size making a proportion of the whole product from 7 to 10 per cent less than that obtained with hand loading. Center shearing and light shooting, although not extensively practiced, has many strong advocates among present-day mine managers. Lumps weighing almost 200 lb. each are successfully handled by this machine. In fact, the size of the individual pieces loaded appears to be limited only by the width of the dipper and the conveyors.

The method of handling cars in the Robert mine is plainly shown in Fig. 4. A trip of empties is stored in room 4, adjacent to room 5 where coal is being loaded. A turnout connecting the tracks in adjoining

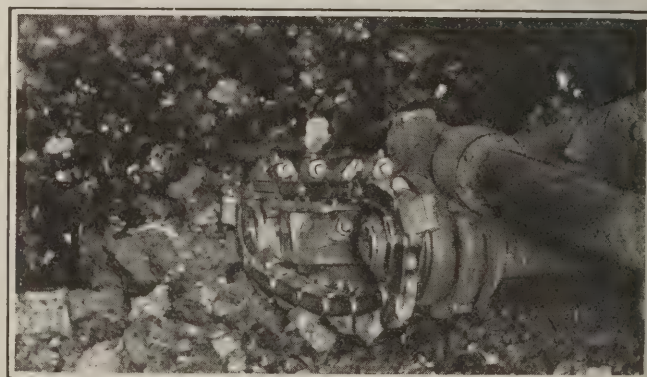


Fig. 3—Cutter Chain Driving Feeding Device

Pick bits carried by this chain clear a passage in the coal pile for the conveyor bearings. This chain, together with a similar one on the opposite side of the machine, rotates the revolving dipper on the gathering head.



rooms is laid in the crosscut most conveniently located to the face. This facilitates the storage of a trip of empties inby and provides clearance beyond the turnout switch in the room being loaded out. In order to accomplish its purpose most effectively, such a crosscut turnout should be from 75 to 150 ft. from the working face.

#### TWO LOCOMOTIVES CHANGE CARS QUICKLY

Two 5-ton storage-battery locomotives constantly attend the loading machine. Barring delays arising from changing trips, from faulty track or rolling stock, the only time consumed in changing cars is that required by a loaded car in clearing the turnout in the crosscut, or that necessary to push an empty from the turnout to the loading machine. The ease with which cars may be changed may be traced in rooms 4 and 5 of Fig. 4.

The motor A with a loaded car clears the turnout in room 5 on its way to the butt entry where the loaded cars are stored. Motor B pushes an empty car to the loading machine. While this is being filled, motor A

Table I—Time Study of Loading Machine in Room 4

Car-Number	Time of Car Loading Seconds	Time of Car Shifting Seconds	Lost Time Seconds	Remarks
1	55	35	...	...
2	35	40	...	...
3	30	40	...	...
4	45	25	...	...
5	40	35	...	...
6	40	25	...	...
7	30	35	...	...
8	45	35	230	Locomotive derailed
9	45	35	55	Defective mine car
10	45	45	...	...
11	45	20	...	...
12	55	85	...	Changing trip
13	55	25	...	...
14	65	20	...	...
15	115	25	...	Cleaning up room
16	80	20	310	Adjusting headlight on machine
17	90	35	...	Cleaning up room
18	125	35	...	Cleaning up room
19	150	...	...	Cleaning up room
Total.....	1,190	615	595	
Average....	63	34	31	

uncouples its loaded car on the entry in the clear of room 4, goes into this room, couples onto an empty and waits in the crosscut for its turn at the machine. Aside from a short backswitch while dropping a loaded car on the entry and coupling to an empty car in the room, the two motors move in closed circuits.

I timed with a stop watch the performance of the loading machine in rooms 4 to 7 inclusive (see Fig. 4). My observations extended from 9:04 a.m., when loading began in room 4, until noon, when work ceased after nine mine cars had been loaded in room 7. They thus extended over a period of 176 min. In totaling the stop-watch readings a minus error of 1½ min. was noted. This arose from protracted periods being read in whole minutes and not in minutes and seconds. The error amounts to less than 1 per cent and consequently may be neglected.

Readings showing the operation of the machine, loading periods, time necessary to shift cars and time lost in rooms 4 to 7 respectively, are shown in Tables I to IV. Five minutes were taken to move the machine from room 3 to room 4, and an equal length of time was consumed in making ready for the machine. In room 4, 19 cars containing a total of 43 tons were loaded in 40 minutes. Five minutes was consumed in moving the loading machine to the face of room 5, a distance of 740 ft., and 6 min. was consumed in making ready for loading operations. In this room

Table II—Time Study of Loading Machine in Room 5

Car-Number	Time of Car Loading Seconds	Time of Car Shifting Seconds	Lost Time Seconds	Remarks
1	65	15	...	...
2	45	45	...	...
3	50	15	...	...
4	50	30	...	...
5	40	30	...	...
6	45	70	...	...
7	40	20	...	...
8	75	150	...	Changing trip
9	50	35	...	...
10	60	20	...	...
11	70	30	...	...
12	60	65	...	...
13	55	20	...	...
14	60	30	...	...
15	100	25	...	Cleaning up room
16	80	25	140	Car derailed
17	160	45	...	Cleaning up room
18	140	...	...	Cleaning up room
Total.....	1,245	670	140	
Average....	69	39	8	

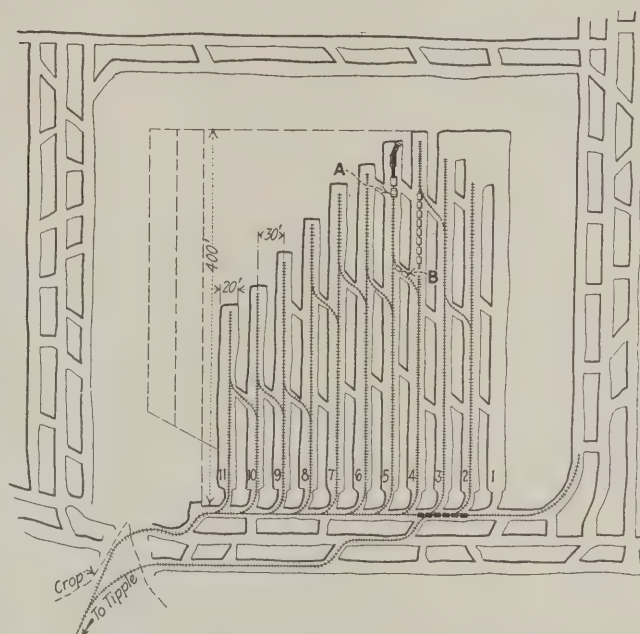


Fig. 4—Room Layout in the Robert Mine

When machine loading was started in this mine it was thought that room coal could be loaded much faster than pillar coal. Experience has shown that there is little difference in the time required to produce coal from either of these two sources and consequently instead of driving 20-ft. rooms on 30-ft. centers it is the intention in the future to make the pillar thickness equal to the depth of at least two cuts.

eighteen cars containing 40 tons of coal were loaded in a period of 34 min. The loading machine was moved to the face of room 6, a distance of 700 ft. in 6 min., and again 5 min. was required in making ready for loading. Here eighteen cars containing 40 tons were

Table III—Time Study of Loading Machine in Room 6

Car-Number	Time of Car Loading Seconds	Time of Car Shifting Seconds	Lost Time Seconds	Remarks
1	60	40	...	...
2	35	30	...	...
3	55	35	...	...
4	85	40	...	...
5	40	190	...	Changing trip
6	50	30	...	...
7	60	50	...	...
8	55	30	...	...
9	45	45	...	...
10	50	40	250	Adjusting machine
11	35	55	...	...
12	60	25	...	...
13	60	40	...	...
14	45	35	...	...
15	90	50	...	Cleaning up room
16	70	25	...	Cleaning up room
17	180	20	...	Cleaning up room
18	250	...	...	Cleaning up room
Total.....	1,105	580	250	
Average....	61	34	14	



loaded in a total time of 34 min., the loading machine was then moved to the face of room 7, a distance of 500 ft. in 5 min. In 9 min. the machine was made ready for loading operations in this room, and in 22 min. thereafter nine cars containing 20 tons of coal had been loaded.

"Making ready" included inspection, minor adjustments and lubrication of the loading machine, also repairing track when necessary and sumping into position. Coal in the face of room 6 was shot down in better shape for machine loading than that in any other room; that in the face of room 7 was in the worst shape. Because the face of room 7 was not sufficiently shot, the rate of loading was lower by over 30 per cent, than in room 6.

The wisdom of using two locomotives is readily dis-

Table IV—Time Study of Loading Machine in Room 7

Car-Number	Time of Car Loading Seconds	Time of Car Shifting Seconds	Lost Time Seconds	Remarks
1	60	30	205	Coal on track
2	80	30	...	.....
3	55	35	...	.....
4	60	30	...	.....
5	60	30	130	Adjusting track
6	135	35	...	.....
7	55	35	...	.....
8	115	30	...	.....
9	90	25	...	.....
Total.....	710	280	335	
Average....	79	35	37	

cernible from an inspection of Tables I to IV inclusive. Reading down the car-shifting column in these tables it will be noted that the time consumed in changing cars generally varies from 15 to 35 sec., depending upon the distance of the turnout from the face. In a few cases as much as 70 sec. was consumed in this operation. Naturally when trips were changed more time was required. Long periods consumed in car shifting in any one table arose from the use of old mine cars that were in poor repair. Rolling stock in proper condition and well-kept track should make it possible to rely on being able to change cars in 30 sec.

In Table V are shown the totals for each phase of the loading operation for each room as well as a grand total for all rooms. From it the following facts may be derived: Actual loading of cars consumed 40.6 per cent of the total time observed; shifting took 20.6 per cent; moving the machine required 12 per cent; making ready, 14.2 per cent; the time lost was 12.6

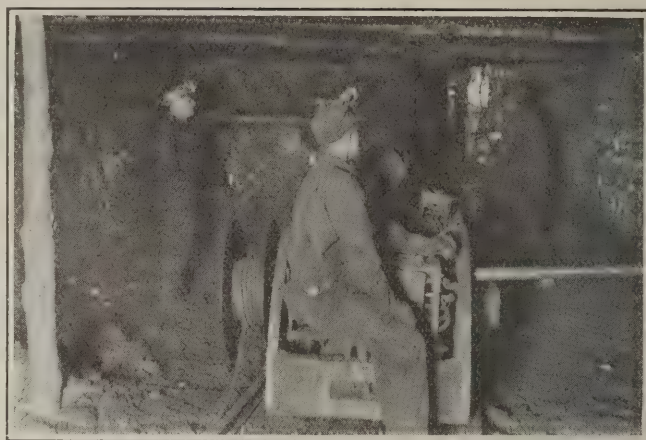


Fig. 6—Starting a Cut in a Room

The top is cut and the center sheared with a Universal machine at this mine. About 1 ft. of top coal is left up to protect the roof. Center shearing makes more bug dust but gives more lump coal per room cut, than could be obtained without it.

per cent of the whole time. During 176 min. 64 cars containing 144 tons of coal were loaded at the rate of 39.1 tons per hour. This rate of production if continued throughout a full shift, would yield an output of almost 400 tons. It is not maintained throughout the working day, because the mine cars are old and not fitted for the work they are called upon to perform. They were constructed originally to hold 1½ tons, but by the addition of sideboards their capacity has been increased to 2½ tons. Another obstacle that interferes

Table V—Totals of Tables I to IV Inclusive

Room Number	Time of Moving Machine Seconds	Time of Making Ready Seconds	Number Cars Loaded	Loading Time Seconds	Number Cars Shifted	Time of Shifting Cars Seconds	Time Lost Seconds
4	300	300	19	1,190	18	615	595
5	300	360	18	1,245	17	670	140
6	360	300	18	1,105	17	580	250
7	300	540	9	710	8	280	335
Total....	1,260	1,500	64	4,250	60	2,155	1,320
Average..	320	400	..	66*	..	36*	....
* Per car.							

with the attainment of this 400-ton output is the aerial tramway shown in one of the accompanying illustrations which transports the coal from the dump to the railroad cars. This means of transportation has a maximum capacity of 375 tons in 8 hr. It is responsible for much of the time lost.

Table VI, covering seventeen working days in



FIG. 5

#### "A Slab Cut"

When track is maintained along the full length of a slab cut the coal rolls out over it making the work of the shoveling machine difficult. The present practice is to add short sections to the track as the machine advances, thus allowing the revolving dipper to work on an unobstructed bottom. The operation of the machine is thus facilitated, and doubtless some degradation of the coal also is avoided.



Table VI—Summarized Record for Seventeen Working Days in October

Working Day	Tonnage Produced	Hours Worked	Hours Delayed	Remarks
1	215	5	3	Repairing loader
2	377	8	..	..
3	325	7½	½	Repairing loader
4	355	8	..	..
5	325	8	..	..
6	167	4½	3½	Delay not caused by loader
7	275	6¾	1½	Delay not caused by loader
8	307	7	1	Repairing loader
9	370	8	..	..
10	305	8	..	..
11	285	6½	1½	Delay not caused by loader
12	160	5	3	Delay not caused by loader
13	157	2½	5½	Delay not caused by loader
14	370	8	..	..
15	325	8	..	..
16	220	6¾	1½	Delay not caused by loader
17	275	6½	1½	Delay not caused by loader
Total.....	4,913	113½	22½	
Average....	289	6.68	1.32	

October, lists the tonnages obtained, hours worked, time lost and the reasons therefor. On an average day during this period 16½ per cent of the working time was lost because of miscellaneous delays arising from equipment. Less than one-fourth of this loss was occasioned by trouble with the loading machine.

The loading-machine crew consists of three men, two runners and a third man stationed beside the forward

cut. Of course, if this coal contains a large quantity of small pieces it would be as hazardous to shoot the coal over it as it is to fire a shot over a pile of bug dust.

It should be remembered that the ratio of operating time to tonnage obtained is the chief factor governing the efficiency of a loading machine. Because a tonnage equivalent to the capacity of the machine during a period of at least five minutes is lost in gathering stray lumps, two men with shovels might be employed profitably to relieve the machine of this duty. It is probable that no loading machine will ever be built that will perform all the functions of a human loader, or be sufficiently flexible to match the co-ordination of man's brains and muscles. All that any machine can ever do is to approach this ideal. The deficiency of the coal loader must be made up by muscular effort.

#### TWENTY-FOUR MEN MINE 289 TONS DAILY

The following men were employed both inside and outside the Robert mine in order to produce the tonnage shown in Table VI: One foreman, two loading-machine runners, one loading-machine helper, two motormen, one trip rider, two cutters, four tracklayers, two timbermen, one blacksmith, four tippie men, one elec-



FIG. 7

#### Room Face

This is the face as it appears after the machine has completed its loading. It is unprofitable to employ the machine to clean up the last bit of coal in a room. The last two cars produced from this place took as much time to load as did the first seven. What coal remains at the face will be loaded out with that from the next cut.

conveyor who shovels up coal missed by the machine. Occasionally a fourth man for cleaning up would be desirable, as the time lost in operating the loading machine at a slow rate when gathering up stray lumps of coal, might be more profitably spent at points where the coal is deeply bedded. An inspection of Tables I to VI will show this fact conclusively.

Reading down the car-loading column in each of these tables, it will be noted that mine cars (capacity 2½ tons) were loaded in as short a time as 30 sec. Nevertheless, the loading period per car attains a maximum of 250 sec. It is true that a portion of this excess time is consumed by the loading machine in dislodging tight coal, but more than half of it results from the necessity of maneuvering the machine about in order to gather up sparsely strewn lumps. This especially is noticeable when loading the last two or three cars from a room. Even then a small quantity of coal is left for recovery with the next cut. Because of the long time necessary for loading the last few tons of coal from a room, it would appear advisable to leave much of this material for recovery with the next

trician, two shotfirers and one watchman. These twenty-four hands loaded an average of 289 tons per working day during October, or 12 tons per man. Of course, no development was attempted when rooms were being worked. Consequently the output was high as compared with what might be expected if both rooms and headings were being driven simultaneously. The additional labor necessary for development work in this mine, would not lower the daily output per man to less than 10 tons. With a 5-ton car, the daily tonnage per man employed in mining operations would probably range from 10 to 15 tons.

The advantages of a large mine car when used in conjunction with mechanical loading are apparent to the officials of this mine. General Superintendent Whalen intends to adopt a 5-ton car with a 48-in. track gage as standard for a new mechanically operated mine that his company contemplates opening. With cars of this capacity, the Oldroyd machine ought to load 500 tons in 8 hr. under conditions similar to those existing in the Robert mine and with the same number of employees. To produce 500 tons, the coal from twelve



FIG. 8

### Tipple and Tramway

This method of transporting the coal from the dump to the railroad car already is beginning to limit the capacity of the loading machine, for as at present operated it cannot carry more than 375 tons in 8 hr. Furthermore it cannot handle large lumps.



room cuts would have to be loaded into 100 mine cars.

Table V shows that a 2½-ton car may be loaded in an average time of 66 sec. At this rate of loading, a 5-ton car could be filled in 138 sec. or 100 cars in 13,800 sec. This represents 48 per cent of an 8-hr. day. It is calculated also from an analysis of the facts set forth in Table V, that about 11 per cent of an 8-hr. day would be spent in shifting cars, and not over 12 per cent in moving the machine, leaving 29 per cent of the time for miscellaneous delays. This would appear to be an ample allowance.

Little success has been reported thus far in drawing pillars with mining machines. Possibly the slow progress attained in this phase of mining operations is attributable to a lack of persistence and official supervision in making the necessary experiments. There is little doubt, however, but that some day pillars will be drawn thus, and inasmuch as they can be removed

much more rapidly with loading machines than by hand, the retreat will be rapid, lessening the danger from falling roof and rendering pillar extraction safer than it is today. It is possible, also, that less slate will have to be handled.

### PILLAR COAL MUST BE SLABBED

It is highly probable that whatever method of mining is adopted, the loading of pillar coal by machine will involve slabbing. Several reasons dictate the adoption of this method. In the first place, a slab cut produces more coal than any single cut made in driving through a pillar, leaving one or more stumps that must be recovered before the next cut is started. Consequently a slab cut expedites recovery and assures safety. It also eliminates sharp curves in the track and provides a more suitable working place for the loading machine.

Pillars are being extracted by loading machine in the Robert mine. The results thus far achieved have been highly successful, and the work has progressed to such a point as to prove that the practice is entirely feasible. Thus Mr. Whalen states: "This work has proceeded without any difficulty whatever and the machine has never been forced to retreat because of unfavorable roof conditions. We feel that we have already demonstrated conclusively that it is possible to draw ribs with this type of loading machine in mines where what might be termed a medium roof prevails."

Though at the initiation of its experiments the company was hopeful of recovering pillars by mechanical loading, it anticipated that greater difficulty would be encountered in loading pillar coal than in loading that obtained from room faces. Accordingly, rooms were driven wide on as narrow centers as the roof would allow. Twenty-foot rooms on 30-ft. centers were therefore adopted as standard, 10 ft. of pillar being taken as the minimum width that safely would hold the roof.

The withdrawal of these pillars is illustrated at A in Fig. 9. The track is first shifted as near to the rib as possible, so as to facilitate the work of both the cutting and loading machines, which operate from it. The pillars are mined by slab cuts on the inby end. The length of such cuts varies from 10 to 30 ft., depending upon the condition of the roof. An 8½-ft. cut leaves a rib about 1½ ft. thick, which, though frequently shattered by shooting and roof pressure, generally requires some pick mining. Some hand shoveling also is necessary in order to place the coal from this rib within reach of the loading machine. The closed end of a pillar cut is sumped on a 45-deg. angle to facilitate machine loading at this point.

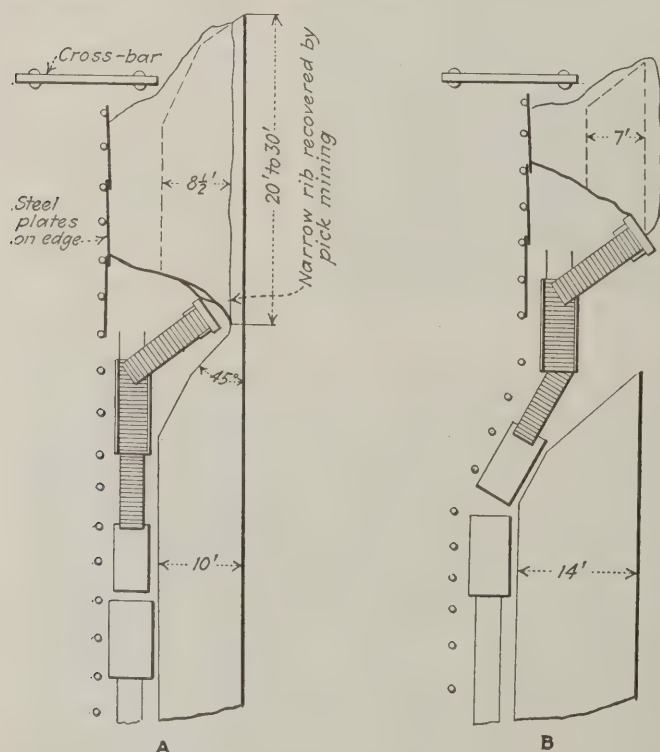


Fig. 9—Recovering Pillars by Machine Loading

Pillars are drawn by slabbing without stump protection. The method now used is shown at A. The 10-ft. pillars are slabbbed to a depth of 8½ ft. the remaining coal being recovered by pick mining. The probable future method of pillar drawing is shown at B. The pillar width will be increased to 14 ft. providing for two 7-ft. slabbing cuts. The first of these will be recovered in a manner similar to that now employed, but the loading of the second will require a curve in the track that will enable the machine to take a position close to the cut.



No track is laid along that portion of the pillar being mined. As the cut is loaded out and the machine moves forward, short rail sections are added to the track. This enables the dipper of the machine to load on an unobstructed bottom.

A row of props is set along the track. Against these, and flanking a slab cut, three or four steel plates are placed on edge, thus confining the coal rolled out from the cut in shooting. A heavy crossbar, and two strong posts are erected abreast of the gob end of a retreating pillar to assist the props in holding the drawslate and other rock immediately overlying the coal.

In fifteen working days the pillar between rooms 1 and 2 (see Fig. 4) was shortened 230 ft.; that between rooms 2 and 3, was drawn back 120 ft.; that between rooms 3 and 4 was shortened 110 ft.; and that between rooms 4 and 5 was retreated 30 ft. This recovery

is equivalent to that of a 10-ft. pillar having an aggregate length of 490 ft., yielding about 1,370 tons. Only one-fourth to one-third of the time required by hand methods is necessary for drawing pillars by machine. As a result, less pressure is observed on the ends of the pillars nearest the gob, and working conditions generally are far safer than in ordinary pillar sections.

Inasmuch as this company has proved that pillar coal can be mined by a loading machine about as conveniently as room coal, it now believes that 20-ft. rooms should be driven on centers of 34 ft. or wider. If the 14-ft. room pillar thus formed could be mined through by two slab cuts each having a depth of 7 ft., the first cut would be mined out in the same manner as that shown at A in Fig. 9. In order to bring both cutting and loading machines within reach of that portion of the pillar taken in the second cut, it will be necessary to curve the track inward as shown at B in this figure.

## Great Britain Revises Its Mine Electrical Rules

Cannot Use Electricity Without Permit—May Transmit Current Above 650 Volts but When Used Must Be Stepped Down Below That Voltage

BY C. H. S. TUPHOLME  
London, England

**N**EW regulations have just been issued by the Minister for Mines governing the use of electricity in coal mines, the main features of which may be summarized with advantage.

If an operator intends to introduce any electrical equipment into his mine, or into any ventilating district in his mine, or wishes to re-introduce electricity into a shaft where the use of electricity has previously been ordered out, he must give notice in writing to the government inspector of the district. If this inspector does not object in writing within a month, then the operator may regard his silence as consent, and may go ahead with his plans. The only exceptions to this are telephones and signaling apparatus.

Every coal-mine operator is obliged during January of every year to make out a return of all his electrical equipment, giving details of its size and type. He is also obliged to keep up to date a scale plan of the mine showing all the fixed electrical apparatus. This plan must be produced on the demand of an inspector.

The usual notices, constructed of durable material, must be exhibited where necessary, that is, prohibiting unauthorized individuals from handling electrical apparatus, giving directions in case of fire, directing the treatment of victims of electric shock, and instructing as to the manner by which communication can be established with a qualified individual in charge of the main switch of the underground electric system. The last notice must be on view at the shaft bottom.

### SECONDARY LIGHTING IN HAZARDOUS PLACES

In locations lighted by electricity, where failure of the light might lead to danger, some type of lamp must be kept continuously burning; there must be an efficient telephonic system between the main switchgear and the main distributing center in the pit; and fire buckets filled with sand must be kept wherever there is any electrical apparatus.

If equipment such as transformers or switchgear are likely to be damaged they must be kept in a separate compartment which must be constructed of fireproof material and must also always be kept dry and free from obstruction.

Every part of the electrical system in the mine must be efficiently insulated, except that (1) the neutral point of a polyphase system may be grounded at one point only, (2) the mid-voltage point of any system, other than a concentric system, may be grounded at one point only, and (3) the outer conductor of a concentric system must be grounded. All generators, transformers and motors, including the portable type, must be connected to a grounding system at the surface of the mine. No conductor of a grounding system may be less than 0.022 sq.in. cross-sectional area.

Where electricity is distributed at a higher potential than 650 volts, it must not be used without being stepped down to below 650 volts and in fact to 250 volts, except in fixed equipment in which the high-pressure parts are stationary. Alternating-current motors smaller than 20 hp. must be supplied with energy through a transformer which will step the potential down to less than 650 volts.

Switchgear and all electrical connections must be rugged enough to withstand rough usage, must be protected against the lodgment of dust on or near live parts, and must be so constructed that there is no open sparking.

### NO SWITCH ALLOWED ON OUTER CONDUCTOR

If a concentric cable is used no switch or fuse may be placed in the outer conductor, unless it is a reversing switch installed where the current is being used. Switches or fuses may, however, be used to break connection with generators or transformers, providing there is no interference with the grounding system of the outer conductor.

All cables, except those for portable apparatus, must be insulated and supported at intervals to protect them from damage. Where the roadway is used for mechanical haulage or where there is any explosion hazard concentric cables, two-core or multi-core cables must be protected by a metallic covering if the potential exceeds 250 volts.

Provided a direct-current system is used not exceeding 650 volts, two single-core cables protected by metal may be used for any circuit, provided the metal cover-



ings are bonded together by ground wires not farther than 100 ft. apart.

An operator working an electrically-driven coal-cutter must not leave the machine while it is working, and he must, before leaving the working place, satisfy himself that the current is cut off from the flexible trailing cable which supplies the coal-cutter.

Current from lighting or power circuits must not be used for firing shots, and cables used for this purpose must not be allowed to come into contact with other conductors.

Haulage by electric locomotives on the overhead wire system is prohibited in any coal mine. Storage-battery locomotives may be used only when permission in writing has first been obtained from the Board of Trade.

Every mine where electricity is used must employ a properly qualified electrical engineer, and if this official is absent for more than one day, the manager must appoint in writing an efficient substitute. The electrician must maintain a daily log book on the prescribed sheets, and this book must be produced on the demand of an inspector.

## Boiler Economies for Coal Men Exhibited at Power Show

Settings, Valves and Meters Being Devised to Meet Trying Demands of Modern Economical High-Temperature Operation

THOSE who visited the Power Show held in New York during the week of Dec. 1 to 6, in conjunction with the annual meeting of the American Society of Mechanical Engineers, could scarcely fail to notice how greatly the number of exhibitors of certain products has increased in recent years. The general quality of the products exhibited also apparently had shown vast improvement.

Perhaps the number and diversity of three items or types of equipment impressed even the casual visitor more quickly than any others. First, a wide variety of refractories were shown. These included many kinds of firebrick in both regular and special shapes as well as insulating brick to be incorporated in the boiler or furnace walls to prevent radiation, also baffle brick, and fireclays and cements of many types. Many such refractories have doubtless been developed to meet the exacting requirements imposed by high boiler overloads as well as the extreme temperatures obtainable by the use of powdered fuel.

### VALVES AND FITTINGS IMPROVED

Pipe valves and fittings also were much in evidence. Only a few years ago extra-heavy cast-iron fittings were considered amply strong for practically any power plant. At this show were exhibited not only steel-casting valves and fittings but also those made from steel forgings. High pressures and superheats demand a type of fitting and even a variety of pipe joint that was totally unnecessary less than a score of years ago.

The third class of power plant apparatus to impress the visitor by its diversity was what might be termed measuring or indicating equipment. In this type might be enumerated, pressure and vacuum gages, high- and low-water alarms, water gages, try cocks, thermometers, hydrometers, psychrometers, pyrometers, draft gages, flue-gas indicating and analyzing apparatus, air meters,

steam meters, water meters and similar devices in vast and formidable array.

Exhibitions of this kind as a rule furnish a fairly reliable index of the progress of the industry, trade, calling or profession represented. Power generation today is an exact science and the modern steam boiler is capable of scientific control and manipulation. The chief requisite for firing a boiler was once considered to be a strong back. Today the actual firing is done by a stoker or, in the case of powdered coal, by an air blast. The fireman must, however, preserve the balance between rate of fuel consumption and load, supply the air requisite for combustion but admit as small an excess as possible, regulate the draft, and otherwise so control the fire as to obtain uniformly the best results possible.

### SCIENTIFIC KNOWLEDGE NECESSARY

This cannot be done blindly or by guess—each move and adjustment must be predicated upon exact scientific knowledge or no exact scientific results will be achieved. He will be most successful as a power producer, who, by means of scientific instruments ascertains the conditions existing in the boilers and furnaces intrusted to his care and then modulates these conditions to suit the load to be carried and in such manner that the maximum proportion of the heat energy contained in the fuel is transformed into useful work.

At the mines coal is less valuable than it is anywhere else except in the ground. Refinements in plant equipment and operation that might be fully justified at an industrial establishment located some distance from the point of fuel origin may not find economic justification at the mine mouth. Nevertheless, if the coal-producing companies generally at their plants engaged such men and installed such equipment for obtaining low-cost energy, as sound economics fully warrant, their costs for coal produced, in at least many cases, would be lessened appreciably. In other cases, being able to generate their own energy cheaper than they could buy it, they would be enabled to maintain their own plants and thus would be freed from the exasperation and expense arising from the more or less frequent failures of power which companies sustain who purchase their energy from a central station.

VACUUM CLEANER FOR SAMPLING COAL DUST—Experiments to determine the feasibility of sampling coal-dust accumulations in mines by means of some method of vacuum cleaning are being conducted by the Pittsburgh Station of the U. S. Bureau of Mines. To separate the dust from the air, canton flannel is used in the domestic vacuum cleaner. Canton flannel allows too much dust to escape, and alundum filters are regarded as more efficient. Tests will be made by the Bureau of Mines to determine how much dust passes filters of the latter type.

SAFETY ASSOCIATION GROWS RAPIDLY—There are now 94 local safety chapters of the Joseph A. Holmes Safety Association located in the different mining districts of the country. Each of these local chapters has a safety director who has been specially trained in the U. S. Bureau of Mines methods of teaching mine rescue and first aid. These safety directors instruct classes of miners, thus supplementing the training work conducted by the Safety Service of the U. S. Bureau of Mines.



## Pittsburgh Coal Co. Evolves Dust Distributor

Nozzle Projects Dust to All Surfaces in Proper Proportion—Mechanical Mule Draws Train at Suitable Speed for Complete Distribution in One Application



BY ALPHONSE F. BROSKY  
Assistant Editor, *Coal Age*,  
Pittsburgh, Pa.

FOR MANY months the Pittsburgh Coal Co. has been building rock-dust distributors in its central repair shop and simultaneously rock dusting its mines. Seven of its mines have already received dust treatment, and the work will be extended to others as the expediency for doing so becomes apparent. One machine after another has been built, tried out and torn down for alteration, only to give way eventually to some other type that proved itself superior. Numerous tests were made in the yard surrounding the company's Library shop, in the progress of which tons of rock dust were blown into the atmosphere. A satisfactory arrangement for feeding the rock dust uniformly and continuously from a hopper to the blower tube and discharge nozzle was devised only after numerous changes had been made. Nozzles of many kinds were tried before the type now being used was accepted.

The Pittsburgh Coal Co. now has a rock-dust distributor that not only lays dust so that it will lodge uniformly on the roof, ribs and floor, but does its work rapidly and with a minimum of labor. Even so, the company does not claim to have a perfect machine, though the present device has proved satisfactory.

On Nov. 24 the machine was moved from Montour No. 4 to the Mansfield mine where it was put to work that night without much advance preparation. In six hours it distributed 203 sacks of limestone dust, each weighing 80 lb., along 7,000 lin. ft. of entry, laying 2.3

lb. per lin. ft. It is capable of discharging 1,500 lb. of dust in 12 minutes of continuous running. The dust train, composed of the machine and two mine cars filled with sacks of rock dust and pulled by a small, special-type, low speed locomotive, was manned by two men.

The rock-dust distributor is shown in Fig. 1. It is protected by pending patents in the names of three of the company's mechanical men who are responsible for its design. Its overall height above the rail is 40 in. From an open-top hopper, having a capacity of 18 sacks or about 1,500 lb., rock dust is fed to the blower tube by a 4-in. worm or screw conveyor located in the hopper bottom and having a 45-deg. pitch. Half of its length is incased in a tube connecting with the blower tube. Rock dust is forced into and through this tube by the revolving worm, this arrangement serving to prevent the establishment of any back pressure from the blower tube into the hopper. Consequently the tube incasing this worm is called the baffle tube.

### PACKING OF DUST PREVENTED

The tendency of a worm arranged as above described is to crowd the dust to one side of the hopper in the direction of translation and to pack it at a point directly over the baffle tube. This is not desirable and to overcome it two other worms are placed above and on either side of the feed worm. These revolve in a direction opposite to that of the main worm, overcoming any tendency of the dust to be crowded in the direction of the feed. Because these two secondary worms are wholly exposed and the feed worm is exposed only on top, they exert a greater action on the dust than the feed worm and keep the dust in constant contact with it.

Lines drawn from center to center of the three worm shafts from a triangle; the axes of the two secondary worms lie in a horizontal plane. The feed worm is driven at 110 r.p.m. by a chain from the shaft of the blower which, in turn, is direct-connected to a motor. The secondary worms are driven at 55 r.p.m. by gears from the shaft of the feed worm. By these means the feed is made positive and there is no arching of dust.

Air is supplied by a 30-in. blower of the company's own design having 3-in. blades. This machine has a normal capacity of about 8,000 cu.ft. at a water gage of 13 in., this being equivalent to the load that a 15-hp. motor (one of the company's standard sizes) will safely carry.

The discharge head or nozzle of this machine is shown in the headpiece. It is of the stationary type,

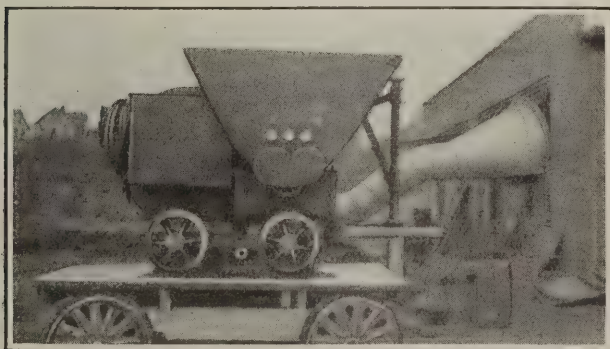


Fig. 1—The Dust Distributor Car Complete

About 1,500 lb. of limestone dust may be placed in the hopper. This is fed at a uniform rate to the fan blast by means of a worm conveyor while two similar conveyors prevent packing of the dust at one side of the hopper base. About 15-hp. is required to operate this machine.

NOTE—The peculiar looking device shown in the headpiece is the cone-shaped nozzle of the mine dusting machine. It is composed of an inner and an outer shell adjustable with respect to each other. Dust is projected at right angles to the major axis of this nozzle and in greater quantity per linear in. along the curved portion of the periphery than along the straight portion.



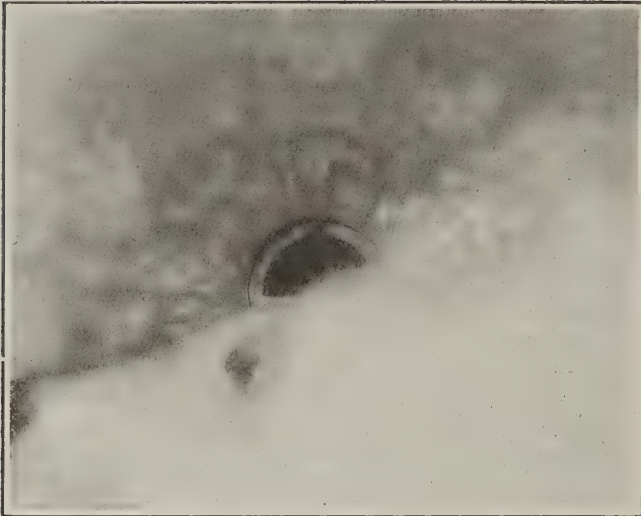


Fig. 2—End-on View of Nozzle

As may be seen the dust is blown out at right angles to the longitudinal axis of the nozzle. The dust thus takes the shortest route to the several surfaces of the mine passages to be coated.

cone-shaped except that the bottom is flattened to make its periphery similar in general outline to that of an entry. Inside of the outer shell of the head is another shell of the same general shape but having a more obtuse angle at its vertex. This inner shell can be adjusted inward or outward to decrease or increase the width of the opening surrounding the periphery of the head. The outer end of the inside shell or jet is provided with a flare plate. As the dust enters the head from the blower tube it is confined between the inner and outer shells and consequently is forced outward to the nozzle opening where its direction of travel is again changed by the flare plate.

#### DUST TRAVELS SHORTEST DISTANCE

This diverts the particles of dust to a direction perpendicular to the longitudinal axis of the nozzle; that is, it so directs the dust that its travel, when the machine is working on an entry, is perpendicular to the surface of the roof, ribs and floor respectively. By this means the distance that particles of dust must travel in order to reach the surfaces to be covered, is made the shortest possible and the force of impact is



Fig. 3—Cloud of Dust Blown by Machine

Much experimentation in the evolution of this machine was carried on in the open air. This shows one of the tests being conducted in the yard of the Library shop. The capacity of the machine may be judged from the density of the dust cloud produced.

the greatest. This action is clearly illustrated in Figs. 2 and 3.

The width of the dust discharge opening at the extremity of the nozzle flare is adjustable within limits. A rectangular plate provided with slotted holes to facilitate adjustment is attached by bolts to the lower or straight portion of the periphery, and a curved plate performs the same function for the circular portion. In practice the opening along the circular section of the nozzle is adjusted to  $\frac{3}{4}$  in., while that of the straight section to only  $\frac{3}{8}$  in. The reason for this difference should be apparent. Because some of the dust which is directed to the ribs and roof of an entry falls to the ground, it is not necessary to project as much dust to the floor as to the rest of the perimeter of the entry. The diameter of the circular portion of the nozzle is 30 in. and the length of the chord on the bottom is 28 in.

Flexible joints are employed at both ends of the connecting tube, that is, where the blower tube joins the connecting tube and where this latter joins the head. By this means great flexibility is obtained. Thus the discharge head or nozzle can be raised, lowered, swung to either side or made stationary in any position. It will be noted from an inspection of Fig. 1 that the diameter of the tube connecting the blower with the head or nozzle is gradually increased. The blower tube (not shown in this illustration), also in-

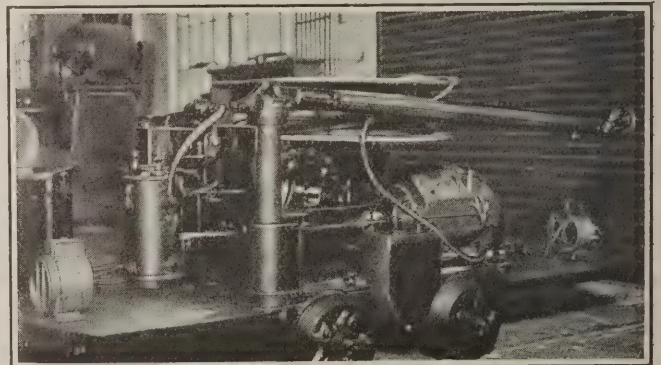


Fig. 4—Special Dust-Train Locomotive

The walk of a horse or mule or the slowest progress of a mine locomotive is too rapid for effective dusting. Consequently this special locomotive was constructed, largely from the odds and ends available at the Library shop, for the express purpose of handling the dust train. It is of small power and low speed, yet it would be advantageous if it could move even more slowly. The next machine of this kind to be constructed will be designed so as to secure this slower movement.

creases in diameter outwardly from the blower toward the discharge head.

For this reason, as the air moves from the blower toward the nozzle, it expands and creates a suction rather than a back pressure in the baffle tube leading from the hopper to the blower tube. When the nozzle is removed and the blower operated at capacity, a vacuum of  $2\frac{1}{4}$  in. is registered in the baffle tube. With the nozzle in place and adjusted to operating position a vacuum of  $\frac{1}{2}$  in. is obtained. It is because of this suction that the hopper need not be entirely closed.

It has been discovered that the speed of a distributor in rock dusting should range from 40 to 100 ft. per min. The ordinary walk of a horse or mule is too rapid and halting for this purpose while the dust discharged in an entry is likely to frighten an animal and at times render him unmanageable. The slowest speed of an ordinary locomotive with all its resistance inserted in the power circuit is too great for the operation of rock dusting. Obviously therefore, some other device must



be employed for this work. The Pittsburgh Coal Co. has developed and begun using what it calls a "mechanical mule." This is nothing more than a low-speed locomotive, one type of which is shown in Fig. 4.

The machine shown was constructed largely from odds and ends found in the Library shop. Briefly, it is chain-driven from a 5-hp. motor, both axles being propelled by this means. Its ordinary speed ranges from 100 to 300 ft. per minute, but this can be reduced to 60 ft. per minute by inserting resistance. It is mechanically controlled by a clutch. The capacity of the motor driving this machine is sufficient for the purpose; if anything, it is slightly too large. The next locomotive of this kind will be built to attain a lower speed than the one shown in Fig. 4.

This mechanical mule is provided with both a trolley and a cable reel. For ordinary work on haulage entries, the trolley, of course, will be used. At the dead ends of butt entries and other similar places where no trolley wire is available the cable will be employed, the reel being capable of carrying about 300 ft. of this conductor, thus enabling the machine to proceed this far beyond the end of the trolley line.

## Making Coke from Non-Coking Coals by Froth Flotation

Non-Coking Coals Resist Coating and Flocculation but Sulphuric Acid Reduces Resistance and Good Coke Can Then Be Made

**M**ANY types of coal either do not coke at all, or do not yield a product strong enough for metallurgical purposes, especially for use in high furnaces. In some cases it has been possible to produce, even from anthracite, a carbonized fuel resembling coke by mixing the material in a pulverized state with pitch and tar, and heating the mixture.

In investigations of a number of non-coking coals, by which is meant coal which does not ordinarily yield coke of the desired strength, it has been found that the surface of the coal particles is such that it resists coating with a binding medium. For example, tar or pitch, or a mixture of these two will not readily adhere to the coal particles and thus promote cohesion.

Wet processes for treating coal, such as the froth flotation concentration process and also various briquetting methods have been fully investigated, and in the course of these studies several non-coking coals have been encountered which, when suspended in water in a pulverized state and subjected to agitation and aeration with a liquid binding medium, do not become coated or flocculated. Such investigations have led to the view that if a non-coking coal can, by any means, be effectively coated and flocculated, a useful coke could be produced.

Three British engineers, Broadbridge, Edser and Beasley, have accordingly devised a process for producing a coke from such coals. This consists in suspending the powdered coal in water and subjecting the mixture to aeration and agitation with a liquefied binding medium, the coal particles becoming flocculated. The product is then briquetted and coked.

Certain coals naturally resist coating and flocculation, but if the surface of the pulverized non-coking coal is treated with a dilute solution of mineral acid, such as sulphuric, and with a liquefied binding agent,

such as tar or a mixture of pitch and tar, the particles will agglomerate and can be coked.

As a rule the acid is added to the circuit liquor itself so as to effect in one operation the treatment with acid and the coating of the particles.

In one process a powdered coal or a froth flotation concentrate is suspended in water and mineral acid of weight equal to 0.1 per cent of the weight of the coal is added. With this is mixed 7 per cent of tar. The mixture is agitated and aerated, and the particles agglomerate. From the agglomerate a good metallurgical coke is obtainable after briquetting to exclude water.

A coal slack obtained from one district in Britain could not be coked at all, and after purification by flotation and direct coking, the best coke obtainable had a strength of only 700 lb. per square inch.

When trying out the new process on this slack 1,200 gm. containing 20.7 per cent ash were crushed to pass a 5-mesh screen and the material was treated by froth flotation, the reagents used being 1 lb. of cresol and  $\frac{3}{4}$  lb. paraffin per ton of slack. The treatment gave 802 g. of concentrate containing 7.5 per cent ash.

The concentrate, plus its own weight of water, was agitated in a froth-flotation cell equipped with an agitator which imparts a vigorous aeration. To it 2.4 lb. of sulphuric acid per ton of concentrate were added and tar to the extent of 7 per cent of the concentrate. The pulp was then heated by steam, and it was noticed that an intense flocculation occurred, the water being easily separable from the froth.

The flocculation was then pressed into briquets at a pressure of 2 tons per square inch, and the product made from it closely resembled a high-grade metallurgical coke, the density being 1.015, and the crushing strength 2,635 lb. per square inch. These results have been confirmed in large-scale tests.

### SAAR VALLEY COAL MAKES COKE

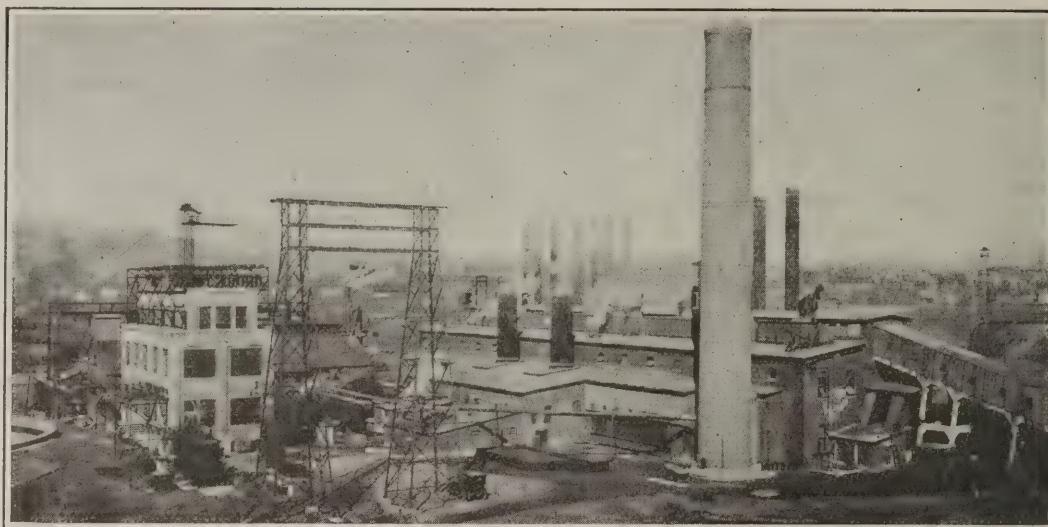
Another coal tested in this manner came from the Saar Valley (France) and consisted of a mixture of bright and dull coal together with carbonaceous shale. The ash content was 24.97 per cent, but was reduced by flotation to 9.12 per cent. This concentrate was screened to separate fines of a size to pass an aperture of 0.008 in. linear, and the fine portion was treated in an acid circuit containing 1 lb. of sulphuric acid per ton.

This fine coal was treated in a cell provided with an agitator, and the binding agent used consisted of 3 parts pitch to 2 parts tar in the proportion of 5 per cent binding medium to the total weight of fine and coarse coal. Steam was admitted and the temperature of the pulp raised to 90 deg. C. After the flocculation of the finer part of the coal, the coarse particles were added during agitation, and the whole material became coated and flocculated. The froth was then drained and briquetted at 2 lb. per square inch.

The briquets were coked in a silica pot which was heated in an electric furnace for two hours at a temperature rising gradually to 1,040 deg. C. The coke produced had a crushing strength of 2,430 lb. per square inch, and the results have subsequently been confirmed on a large scale in a coking oven.

The same concentrate flocculated in the same way but filtered and not briquetted yielded a coke having a crushing strength of 1,038 lb. per square inch. When the coal was neither flocculated nor briquetted the coke produced was not uniform, nor sufficiently homogeneous to justify any tests being made to prove its strength.





*Hampton Power Plant*

## With Air Lift Flood Water Can Be Removed at a Single Inexpensive Setting of Equipment

Difficult Pumping Problems Solved by Use of Compressed Air—  
Three Air Lifts Deliver 2,300 Gal. per Minute—Economy of Installation and Convenience of Operation Distinguishes the Air Lift

BY EDGAR J. GEALY  
Associate Editor, *Coal Age*,  
New York City

LAST MONTH when Herbert Axford, of the Ingersoll-Rand Co., presented his paper at the Scranton Engineers' Club on the operation of an air lift in the mines of the Glen Alden Coal Co., he revived interest in a water-raising system little used at most mines and almost forgotten at others. He showed how in spite of certain disadvantages the air lift can be used in emergencies and also that it can be utilized in cases where the water cannot be removed by a pump, because a pump cannot start the water on its way unless it can be placed near enough to the surface of the water to reduce the suction lift to manageable proportions.

There is nothing mysterious about an air lift. Years ago some of the men who installed them chased all observers away just before the plant at the well was put in operation. Consequently, many people thought some strange contraption or mystic word was necessary to get one in operation. A driller once asked a hydraulic engineer what kind of a fitting he was going to put at the end of the line used in an air lift, and when the engineer said he was going to use a reverse bend the driller thought the engineer was making fun of him. When the engineer finally said that he might not use any kind of fitting whatever, the driller thought he surely was demented.

NOTE—Mine water is used for condensing purposes at the Hampton power plant which is shown in the headpiece, consequently it was imperative to start the unwatering of the flooded areas at once. The reservoir and water hoist shaft are located just beyond the right-hand end of the boiler room.

The air lift operates on the principle that the solid column of water on the outside of the pipe outweighs the column of air and water on the inside and so lifts the water in that column to the surface.

In its use of energy the air lift is relatively inefficient. The ratio of foot-pounds of work done upon the water to the foot-pounds delivered to the electric motor which drives the compressor by which the air pressure is furnished, shows that under good conditions the efficiency of the device is about 40 per cent.

However, at times, the air lift is unusually efficacious when we consider the difficulties attending the use of other methods of raising water. For instance, it has the advantage that all the equipment may be located in any desirable place. Only the air line and discharge pipe need be located in the water. A pump must be set up not much more than 14 ft. above the surface of the water it is to raise; a compressor for an air lift may be located at any height above the water level.

Contrary to common belief the air in an air lift does not blow the water out of the discharge line. If it does in any particular case it indicates a waste of energy.

The outlet of the air line should be a considerable distance below the surface of the water to be raised. Within certain limits, the deeper the better. Considering the vertical distance from the nozzle of the air line to the discharge level of the water as unity, if the air line is 70 per cent submerged, the operating results are satisfactory. When the submergence is only 20 per cent the efficiency of the air lift is extremely low.



One of the most successful recent uses of an air lift was made by the Glen Alden Coal Co. at Scranton. On April 7 the Lackawanna River broke into the Taylor mine of this company. The territory flooded was part of a large drainage area handled by the Hampton pumping station.

#### FIVE BIG PUMPS SUBMERGED

The Hampton pumproom is located in the Clark bed which is above the Dunmore Nos. 1, 2 and 3 bed. In a short time after the river had broken in on the mine the water in the pumproom had risen 14 to 16 ft. above the floor level. The five large 5,000-gal. per minute pumps, each driven by a 1,000-hp. motor, were completely submerged. Only the Oxford and Holden pumps, located in adjacent mines at higher elevations, were left undisturbed. Normally the pumps at these last two mines are used to handle water collected at higher levels than the sump at the Hampton pumproom.

Liberal pumping capacity had been installed at the Hampton pumphouse, usually only one of the five big pumps were required continuously and one of the other pumps used 14 hr. per day. In spite of the large capacity of the station it could not stem the flood, and all the pumps were completely submerged.

#### PUT OLD WATER HOIST IN SERVICE

A 3,500-gal. per minute water hoist located on the surface at the Hampton plant was ordered dismantled a few weeks before the flood. Fortunately, this work had not been started, so after a few hasty repairs it was put in service. This hoist together with the Oxford and Holden pumps were the only important re-

maining pumping units left to handle the flood water.

The Hampton power plant, which is located on the surface near the pumping station, uses mine water for condensing purposes. About 10,500 kva. of generating capacity is in the plant,

and everything depends upon the supply of water from the mines. Consequently the Hampton power plant was in danger of being shut down and it was the water hoist which saved the day.

After the river water had been diverted from the cave hole which had opened into the Taylor mine, the water in the Dunmore Nos. 1, 2 and 3 beds began to lower slightly as it sought its level by flowing into the less accessible basins not previously filled. By April 10 the water in the Hampton pumproom had dropped 10 ft. and on April 12 the first motor was removed for repair. The next day the water was 40 in. above the pumproom floor, but the first pump was started, it being located at a higher level than the other pumps.

On April 30, the first air lift was installed to assist in unwatering the Dunmore beds. On May 2, another air lift was started and later a third was put in operation. The first two air lifts each discharged through 16-in. plain cast-iron pipes. Because much surface water entered the mine and greatly diluted the acidulous mine water, the use of this kind of pipe was successful. The air compressor which supplied the air for all three lifts was located on the surface and was connected to a large receiver which discharged into a 6-in. pipe line.

#### PUMPS RAISED WATER TO SURFACE

The water raised by the lifts was discharged into the Clark bed from which it ran into the Clark bed sump and was raised to the surface by the five centrifugal pumps which had previously been put back into service.

The discharge line was arranged as shown in Fig. 1. A T-connection was installed at the Clark bed level, and a short length of pipe was placed on the upper end of the T to act as a surge chamber. The end of the air line was located about 25 ft. above the Dunmore No. 3 bed, the lowest of the Dunmore seams.

On May 16, the third air lift was installed, but it discharged through a 12-in. pipe. This lift was put into operation because the compressor was sufficiently large to handle this extra load and thus speed up the unwatering process.

In the period extending from April 30 to Aug. 14, 1923, the water pumped by the pumps in the Clark bed was 1,200,000,000 gal. In the same period in 1924 when the air lifts were in operation, 1,860,000,000 gal. of water were discharged at the surface. From this it was estimated—assuming that the inflow during this period was the same both years—that the air lifts raised 660,000,000 gal. while in service. Records show that if the 12-in. line is considered about half the

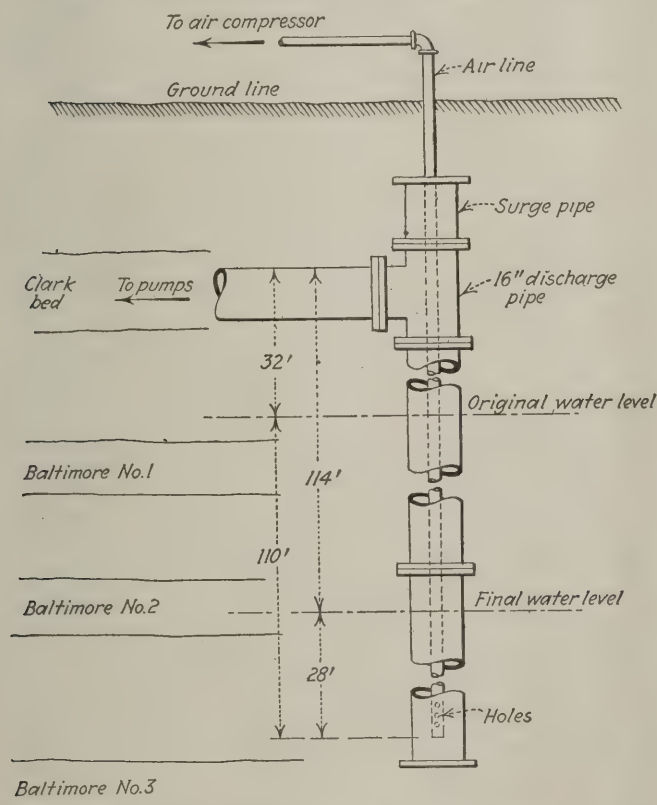
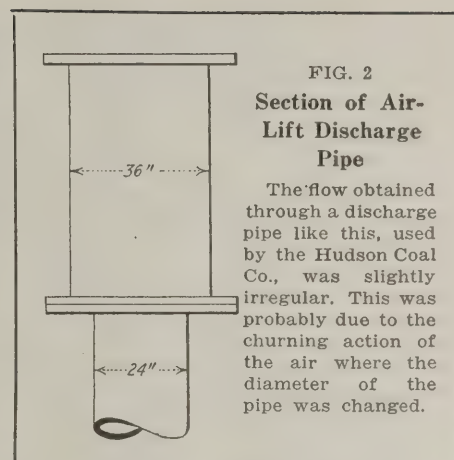
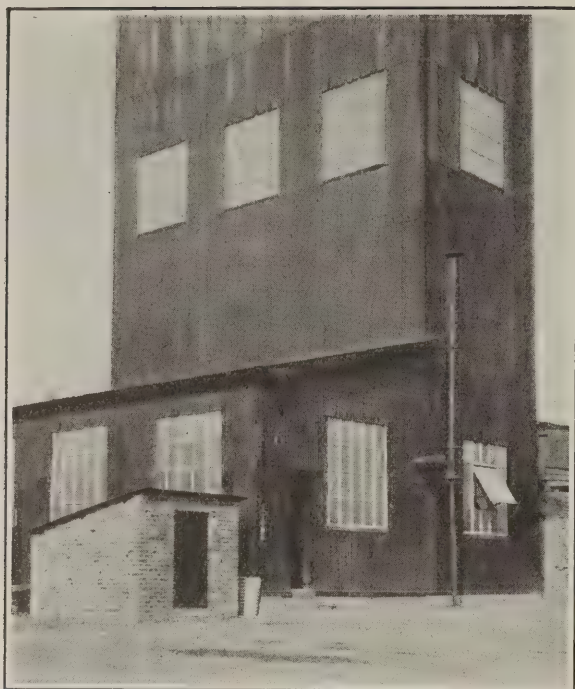


Fig. 1—Air Lift Unwaters Areas Far Below Pump Level

The air compressor was located on the surface and an air line dropped through the 16-in. discharge pipe. Water in the three Dunmore beds was delivered to the Clark bed pumps. Above the T-connection at the Clark bed were a few lengths of large pipe from which the air separated from the water could escape. Centrifugal pumps raised the water from the Clark bed to the surface. The efficiency of the air lift varied with the submergence from about 40 per cent to 20 per cent.





**Fig. 3—Vertical Pumps Will Operate When Submerged**

The tall building, part of which is shown in the illustration, is a Hudson Coal Co. pumphouse. It contains two large motors which drive two vertical-type centrifugal pumps located in the mines. There is no danger of losing the motors when the pumps are submerged, but the pumps must not be stopped when they are under water. The building is unusually high so that the shaft between a motor and pump can be raised for inspection or repair. Care must be taken that the couplings in the shaft are not loosened for, when the power is shut off, the returning water may drive the impeller as a water wheel and the pump will run backward.

capacity of one of the 16-in. lines the lifts were in service 4,650 air-lift-hours. From this figure it was estimated that the lifts discharged 2,360 gal. per minute. The initial submergence was 77 per cent and the final submergence about 20 per cent. The air pressure was about 45 lb.

Another interesting air-lift installation was made at one of the Hudson Coal Co.'s mines near Jermyn. Here a 24-in. pipe line was used in part of the discharge column and several 36-in. lengths of pipe used at the top.

#### AIR LIFT PROVES EFFICIENT

The Harleigh-Brookwood Coal Co. also recently used an air lift. Here a pump connected to a 14-in. discharge line had been submerged during the rainy season. The column line lay on a steep slope but nevertheless a 3-in. air line was inserted in the discharge pipe and a compressor put to work. Much to the surprise of the engineers the discharge was about 2,200 gal. per minute. The efficiency of the scheme was about 30 per cent. One of the workmen said it was more efficient than the old pump which was submerged.

A story is told of a master mechanic in a New Jersey iron mine combining the air-lift principle with a centrifugal pump. It is said he connected an air pipe into the column line of the pump and started both the pump and compressor. The result was that by this means he could raise the water 50 ft. higher than the pump was capable of doing alone. The conditions under which this was done are not entirely known, but it is understood that the presence of high water made the greater lift necessary. Some engineers are wondering whether such an arrangement is feasible and further investigations are being made.

## Yampa Field May Provide West With Hard Coal

**Anthracitization Varies Much in Any One Area—Ash Content Not Unduly High—Other Coals Are Bituminous And Subbituminous**

The coals of the Yampa field, in Routt and Moffat counties, Colorado, are receiving more attention as progress is being made on the Moffat tunnel. The present steep grade over the Continental Divide of the Denver & Salt Lake R.R., the only line serving this field, is a serious handicap to the transportation of coal to Denver and the Great Plains region.

When the tunnel is completed one ordinary locomotive will haul twenty-two loaded coal cars over the divide in half the time that four Mallet engines now perform the same task. The great value of the tunnel to the coal industry can be made evident by pointing out that the tunnel will save 23 miles of line, 2,406 ft. of lift, and countless delays and blockades by snow and will reduce the gravity load on each coal car by one-half. In anticipation of the impetus to coal development that must follow the completion of the tunnel the coals of this field have recently been sampled by J. Brian Eby of the Geological Survey.

The analyses of the samples of anthracite from the Crawford tract show the variation in the rank of the so-called anthracite coals. In general, anthracite has a fuel ratio that ranges from 10 to 30. One sample, collected 125 ft. from the mouth of the mine, is a good anthracite, whereas another sample collected 95 ft. from the mine mouth is semi-anthracite. Three samples are good anthracite coals of over 12,000 B.t.u., but from the locality at which one was taken the coal rapidly decreases in rank toward the mouth of the mine, 260 ft. distant.

#### LOW-ASH BITUMINOUS COAL

The results of all analyses made of Yampa coals show that the sub-bituminous coals as mined contain an average of 19 per cent moisture, 32 per cent volatile matter, 45 per cent fixed carbon, and 4 per cent ash, and that they have a heating value of about 9,600 B.t.u. The bituminous coals average 9 per cent moisture, 47 per cent fixed carbon, and 5 per cent ash, and have a heating value of 11,600 B.t.u. The anthracite averages 6 per cent moisture, 6 per cent volatile matter, 78 per cent fixed carbon, and 10 per cent ash, and has a heating value of about 12,500 B.t.u.

Samples collected in the same tunnel, however, such as that on the Crawford tract, show that the coal does not hold its anthracitic character over any large area. This condition is due to the fact that the anthracite of this region was formed ages ago by the local alteration of beds of bituminous coal by the heat of adjacent masses of intruded rock. As the beds of anthracite are of uncertain extent, attempts to mine it should be preceded by careful prospecting and sampling, either by tunneling, shafting, or coredrilling. The rank and quantity of the Yampa coals are stated in Bulletins 297 and 748 of the U. S. Geological Survey.

ELECTRIC LAMPS are being introduced at the Rum Creek colliery of the Youngstown Sheet & Tube Co., Dehue, W. Va. This is the first mine in the Logan field to work with closed lights.



# What Changes Should Be Made in Income Tax Laws

Rulings Should Not Be Revised Without Notice and Revision Should Never Be Retroactive—  
All Rulings Should Be Published—Doubtful Items Should Not  
Be Classified as Capital Expense

BY JOHN LAING

President, Kanawha Coal Operators Association,  
Charleston, W. Va.

**P**ERHAPS the taxpayer's most general objection to Federal income-tax legislation is that it leaves him uncertain as to his tax liability. Instances could be multiplied indefinitely of injustices by reason of that uncertainty. Of peculiar importance to the coal-mining industry is the fact that the Solicitor of Internal Revenue in a decision published Sept. 15, 1924, disallowed the deductions made by a coal company to cover coal cars, steel rails, and trolley wire which had been purchased solely because the length of haul had increased. The investment was necessary to maintain the normal output of the mine.

Deductions of this character were specifically allowed by Article 222 of Regulation 45, and by Article 222 of Regulation 62 if my construction of these latter regulations is correct. Many cases have been settled under these rules, and this recent memorandum of the Solicitor represents a complete reversal of the Department's policy, with the result that taxpayers in the future will not receive the same treatment as those in the past and may have many cases reopened which were considered closed.

This is not the only perplexity with regard to tax payments, for in the course of business transactions, parties are often prevented from making sales or entering into contracts for fear of the effect of the income-tax law. In consequence attorneys frequently are obliged to say in such cases that they cannot definitely advise clients as to the effect which such transactions will have upon their income taxes.

The Department refuses to advise parties authoritatively in advance as to what their tax liability will be. In legislation as complicated as the income-tax law, and as far-reaching in its scope, the element of uncertainty cannot be entirely eliminated. Two provisions, however, would greatly lessen this evil. They might be formulated thus:

(a) When the Department has once established a ruling allowing a deduction to the taxpayer, such ruling should not be changed, except so far as it may apply to future years. In other words, where taxpayers, under the rulings of the Department, proceed upon one theory of the law, they should have the advantage of that ruling until they are advised that the Department

has reversed its position, and this reversed position should be applicable only to taxes accruing subsequent thereto.

(b) An agency should be provided whose decision would be binding, to which taxpayers who contemplate entering into business transactions may submit for determination, questions of tax liability, so that the taxpayers may know in advance just how their acts will affect the taxes they will have to pay.

*Unpublished Rulings—*

An element contributing to the uncertainty in the administration of the income-tax law is the practice of the Department of promulgating, for the benefit of tax officials, rulings which are not made public. Attorneys and those practicing before the Department, frequently have the experience of meeting a ruling which has not been given to the public. It would be, of course, impossible and un-

desirable to publish every proceeding in the Department, but any ruling which is to be used as a precedent should be published so that it would be equally available to government officials and to representatives of the taxpayers.

*Expense—*Due to the complicated character of the income-tax law a tremendous expense is placed on the taxpayer. There are two important costs in all complicated income-tax cases—accounting and legal services—entailing upon the taxpayer the double burden of employing an expert accountant to arrive at the facts as disclosed by the books of the taxpayer and a lawyer, or tax expert, to present the legal effect of those facts when ascertained. This two-fold expense is imposed upon the taxpayer in addition to the tax. It would seem that this most burdensome element of the income-tax law is almost inherent and constitutes one of the most serious objections to the law itself.

*Capital Items—*The Department, under the indefinite language of the Act, has shown a disposition to classify all doubtful items as capital expenditures rather than as expenses, thereby depriving the taxpayer of deductions to which he is entitled. I have already noted the recent ruling whereby mine cars and the like, which were purchased by a coal company simply to maintain normal output, were disallowed as a deduction.

In one of the companies in which I and my associates



are interested, the Department has disallowed as a deduction certain surveying expenses to which the company was put to settle its boundary line with an adjoining owner. This surveying was done long after the property was acquired, and the expenditure added nothing whatever to the productive value of the property, but the Department, nevertheless, has classified it as part of the cost of the land. Any item of expenditure which does not add to the productive value of the business should be classified as an expense, and the act should be so amended as to require the allowance of such deductions.

*Delay*—Section 1009 of the Revenue Act of 1924 provides that ordinary internal-revenue taxes shall be assessed within four years after such taxes have become due and no proceeding in court for the collection of such taxes shall be begun after the expiration of five years after the taxes have become due. This provision of itself permits great delay in the settlement of tax matters, and virtually all companies have several years' unadjusted tax liabilities hanging over them.

Though the period during which the government is allowed, under the act, to adjust taxes is unduly long, an even worse situation has developed because the Department frequently virtually requires taxpayers to sign waivers, under the threat, in effect, that if such waivers are not signed, there will be an arbitrary assessment.

As has been said by one writer on income-tax law, this is little better than a "departmental hold-up," and it has prolonged indefinitely, in many instances, the taxpayer's period of uncertainty as to his tax liability. Thus companies, as well as individuals, continually face an unadjusted and unascertained tax liability. This has had a most harmful effect upon the business of the country, particularly in two ways:

(a) Persons are afraid to buy the stock of a corporation for the reason that they will have no means of knowing what the unadjusted tax liability on the company will be.

(b) In many instances, some of which have come within my personal knowledge, the stock of a corporation changed hands through voluntary or involuntary sale. The new owners had no knowledge of the corporation's tax status, and later large additional assessments were made for taxes payable for years prior to the transfer of stock and these, in effect, fell on its new owners.

It would be perhaps impossible entirely to eliminate this condition, but the following are corrective suggestions:

(a) The period in which the government may collect back taxes should be greatly shortened, and, if necessary, additional employees in the Department be authorized, so that they could keep up with the work. I believe, however, that if the present facilities and help of the Department were applied with anything like the efficiency of a private enterprise, such additional employees would not be necessary.

(b) The Department should not be allowed to request

waivers from the taxpayers and should not be permitted to make a reassessment upon an arbitrary basis nor until after a thorough examination has been made.

In dealing with this matter I am treating more of the abuses under the old acts and these abuses may in part have been cured by the act of 1924, but I much doubt if this is so. Much depends upon the way in which the Department administers the new act.

*Publicity of Return*—Section 257 of the Revenue Act of 1924 provides that returns upon which the tax has been determined shall constitute public records and shall be open for inspection only upon order of the President and for the benefit of certain committees of the Senate or the House, certain officers of any state and a certain percentage of shareholders. This provision has been

much discussed and its injustice is apparent. It holds out the possibility, at least, of any business being made the subject of partisan and political scrutiny. The section further provides that a list containing the names of taxpayers, together with the income tax paid by them shall be made available to public inspection. Under this provision any competitor can ascertain year by year the income tax that is being paid by his rival, and through that knowledge he can easily de-

termine his competitor's net income. Many other abuses could be cited which would undoubtedly arise under this provision, not the least of which is that knowledge of every one's net income will be in the possession of anyone who has sufficient curiosity to look at the list and estimate the income from the tax paid.

This provision, which was inserted in the act of 1924 under the stress of political agitation, is, in my opinion, wholly bad and should be eliminated from the act. Its effect on the coal-mining industry would be particularly unfortunate in case of labor troubles or the attacks of demagogues. Knowledge of the income tax paid by various companies in a preceding year, with the resultant knowledge of what the net income was, would be a potent weapon in the hands of the enemies of the industry.

*Net Loss*—Section 206 of the act of 1924 provides that a net loss in the conduct of a business may be applied against income for the next two succeeding years. This step is an improvement over previous income-tax legislation. However, where the industry has a prolonged depression and where a company is in a formative period, two years is too short a period and should be extended.

*Formality of adjustments*—Section 1005 of the act of 1924 provides that there shall be only one inspection of the taxpayer's books, unless the taxpayer requests otherwise, or unless the commissioner, after investigation, notifies the taxpayer in writing that an additional inspection is necessary. In practice, even under the similar provision of the 1921 act, the Department has subjected the taxpayer to more than one examination. I have personal knowledge of this in some of the companies in which I am interested. This section should be amended so as to permit only one examination, unless

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**W**HEN MINES are extended, mine cars, trolley wires and steel rails have to be purchased to maintain tonnage. Hitherto these have been listed as current expenses under the departmental rulings, yet a decision has been rendered recently classing these expenditures as additions to capital. This not only affects future tax payments, but puts in question past settlements adding to the grave uncertainties in which the whole question of taxes is at present involved. Mr. Laing in this article indicates what changes in the laws would assist in remedying fundamental injustices in the levying of income taxes.

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the taxpayer requests otherwise, or unless there is reason to believe that the first examination has been rendered inadequate by reason of fraud or concealment on the part of the taxpayer.

The mere notice of the commissioner should not be sufficient to make an additional investigation permissible. This provision is virtually equivalent to permitting the Department itself to determine when it will do its work over again. Section 1006 provides that after a determination and assessment in any case, or acceptance of any abatement, credit or refund, "an agreement may be made in writing between the taxpayer and the commissioner, with the approval of the Secretary, that such determination shall be final." In practice it is comparatively difficult for the taxpayer to obtain the benefit of this section.

When such an agreement is requested the Department usually makes a re-examination of the taxpayer's books, even though they have been considered closed. Attorneys have the impression that the taxpayer runs a risk in asking for such an agreement. On the other hand, it is of the greatest importance to a taxpayer that he be assured within a reasonable time that his tax matters for any one year are closed and cannot be opened. This is particularly important where he is contemplating a

sale of his property and desires to assure the purchaser with respect to tax liability.

A provision should be added to the law that whenever the government sends out a 60-day notice (as provided in section 274 of the Act) advising taxpayers of a deficiency in tax, it be precluded from claiming any greater tax and that upon an adjustment between the unit and the taxpayer after such a notice, whether there is an appeal to the board or not, the tax matters for that year be automatically closed with no power in the Department to reopen them, except upon a showing of actual fraud or concealment upon the part of the taxpayer.

In other words, whenever there has been an adjustment for any one year between the taxpayer and the government, it should be considered final in the absence of fraud, even though no formal agreement has been signed. No injustice could be done the government, for the reason that it need make no financial adjustment until it has inspected the taxpayer's books. On the other hand, such provision, coupled with shortening the time in which the government shall have to collect taxes, would greatly shorten the period of uncertainty as to taxes for past years, which is now so great a burden to taxpayers.

## High-Pressure Rock Dusting In Utah Coal Mines

Use Water Lines, Pack Mules and Sledges to Convey  
Dust—Barriers Made Useless by  
Absorption of Moisture

AT CASTLE GATE No. 2 mine the height of the roadways makes high-pressure dusting essential and a larger quantity of dust has to be used, than in a mine the roadways of which have a lesser perimeter. For this reason a 10x10-in. portable compressor giving a nozzle pressure of 70 lb. per square inch is used and about 3.5 lb. of rock dust is distributed per lineal foot. The limestone dust used is obtained from a cement company which pulverizes the material to a fineness suited to the manufacture of cement.

For reaching parts of the mine not equipped with electrical current, as well as to economize in the moving of the machine, the water lines are drained and blown out to free them of water and are then connected to the dusting machine. By this means dust has been delivered under sufficient pressure a distance of 3,600 ft. down a 12-per cent pitch, using the 3-in. water line already in place. Roadways also have been dusted successfully 7,200 ft. from the compressor using a 4-in. water line which lay up the slope from the compressor on a 6 per cent average grade. It is purposed to station a 12x12-in. compressor in the power house at Castle Gate No. 1 for this purpose. About the Sunnyside dusting plant, where the same pressure system has been used with a 10x10-in. portable compressor, the following information is available: The air pipe leading from the compressor to the injection nozzle is 1 in. and the pipe from the injector to the dust line is 1½ in., the nozzle itself being ½ in. The pressure at the compressor is 80 lb., and the safety valve opens at 90 lb. At the injector nozzle the pressure is 70 lb. A 12-ft. length of 1½-in. pipe is used on the dust line. Where 20 ft. of pipe was employed the friction was excessive. Figuring 75 lb. of dust per sack, the machine throws dust

at the rate of 15 lb. per minute. From 35 to 50 sacks of dust are used every eight hours depending on conditions. This will cover 700 to 1,500 ft. of entry with an average of 838 ft. per shift.

### WATER PIPES CONVEY DUST

At this mine also water pipes have been used successfully for dust distribution. On an average, 3.4 lb. of dust is used per lineal foot of entry, this figure includes the dust used in the crosscuts which are dusted as far back as the stoppings. Where difficulty was experienced in reaching points in untracked airways dust was conveyed on pack mules and sleds.

### Cost of Dusting at Sunnyside, Utah

Application	
Labor .....	\$0.035 per lineal ft.
Material .....	0.017 per lineal ft.
Repairs	
Labor .....	0.007 per lineal ft.
Material .....	0.008 per lineal ft.
Total .....	\$0.067 per lineal ft.

In the use of dust for the barriers in return airways the Utah Fuel Co. has found, says A. C. Watts, the chief engineer and geologist, that the unprotected dust will become so moist in three days' time that it can be balled up in the hand and that no dust cloud is raised when dust barriers are tripped. Even when the dust is covered with brattice cloth the result is the same.

Waxed paper, such as comes in powder boxes, was used for holding the dust. It prevented absorption of moisture for about 10 days. Dust was then placed in a cardboard detonator box with a tight lid. In two weeks the box was soggy with moisture and the dust on top would not form a dust cloud, but the dust in the center of the box was dry. With dust costing \$6.50 to \$7 per ton, the use of barriers in moist back entries becomes prohibitive.

NEVER HAVING entered a coal barony himself, John L. Lewis is without sin and therefore yearns to cast out the first Stone.





## News Of the Industry



### Need of Accurate Coal Output Figures Again Emphasized

Industry Frequently Forced to Do Business in Dark—Shortage in 1920  
Greatly Exaggerated Because of Lack of Dependable Data—  
“Phony” Statistics Worse Than None

BY PAUL WOOTON  
Washington Correspondent of *Coal Age*

The generally held opinion that it is imperative to have more coal statistics frequently has been reflected in this correspondence. Arguments for these statistics, when boiled down, are based on the inadvisability of attempting to do business in the dark. The classic illustration of the need for more good statistics is reference to 1920, when a real shortage of coal was exaggerated greatly in the public mind. Had it been known at that time after the critical period, which was ended in June, that stocks were increasing steadily, the frenzied buyers might have realized that the emergency had passed. As it was they did not know that stocks were increasing and the disturbance of the market continued for months. In fact it reached its peak in October, when stocks had climbed to the level of comfort.

The current issue of the *Purchasor*, the semi-monthly publication of the National Association of Purchasing Agents, furnishes an illustration of a different kind of danger—the danger of inaccurate statistics. Perhaps a better word would be “phony” statistics. Since late in 1922 the association periodical has carried a current survey of stocks and consumption of coal. The basis of the charts which are printed is not revealed. They are said to be constructed from returns from members of the association—a membership which represents a buying power of many million tons of coal annually.

#### Important Essential Missing

An examination of the charts indicates that the consumption which they purport to show sometimes runs as high as 48,000,000 tons a month, or in other words, practically the total consumption of coal. An essential of the statistics—the number of firms reporting—is omitted. On this point the association never has enlightened the public.

The possible harm that such ex-parte statistics can do is illustrated by the latest report which covers the month of October. It states that from Oct. 1 to Nov. 1 the stocks of industrial users increased 25,000,000 tons. The *Pur-*

*chasor* is so sure of its data that it can tell you the exact number of tons in stock. The more cautious Geological Survey and Census Bureau, in their statements based on written replies from more than 5,000 consumers, never dare to claim an accuracy closer than two or three million tons, but the *Purchasor* has it figured down to the last ton. On Oct. 1 stocks are declared to be 52,468,725 net tons and on Nov. 1 they are shown to be 77,754,068 net tons. In other words, in the brief space of thirty-one days there went into storage exactly 25,285,343 tons.

#### Discrepancy Evident

The coal trade was not aware of its extraordinary performance in October. The *Purchasor* tells the producers that they have mined coal enough in one month to put 25,000,000 tons into storage, besides meeting the current consumption. It is true that when the coal man looks at the *Purchasor's* chart he is bound to be puzzled in figuring out how this could be because the total tonnage produced, according to the *Purchasor*, was only 55,000,000 tons, while the industries themselves (not including “coal consumed for industrial heating and consumed by the householder”) used about 35,000,000 tons. Such a discrepancy seems not to worry the *Purchasor*. An advance proof of the statistical article was sent to the National Coal Association. It was hurried back with the discrepancies noted. This communication was acknowledged with the statement that corrected proofs were being forwarded. The corrected proofs were not received and the *Purchasor* was printed with the original material unchanged.

There is no inclination to question the good faith of the purchasing agents or their fuel committee. It must be admitted that they have had reason to complain against the service they have been given by the coal industry on occasions. But there is no getting around the fact that the circulation of much claims of sudden enormous additions to stocks have a most injurious effect on the coal operator. Prices already are below a living level.

There was an addition to stocks in

### What Illinois Miners Earn

Those Illinois miners who worked during October averaged a weekly pay of \$36.17 and in November, \$29.78, according to the monthly report of the state Department of Labor. The same number of names appeared on the various mining company payrolls during both months. The average earnings of the miners thus dropped 10.6 per cent. The reported running time of the state dropped only 2 per cent from 49.4 per cent of full running time in October to 47.4 per cent in November. Therefore it could be deduced that Illinois miners fortunate enough to have work are still able to buy gasoline for their motor cars. But the fact that several mines with big payrolls have worked almost continuously during those two months indicates that a considerable share of the total wages of the state have gone to a comparatively few men. The rest are in the same condition as the union miners in most other parts of the land.

October. A brief study of the official data on production in the last stock report of the Geological Survey and the Bureau of the Census shows that the addition could not have been 25,000,000 tons. It is entirely obvious that stocks were augmented by much less than 5,000,000 tons. The claim to 25,000,000 tons is preposterous. It would mean an addition to stocks such as never have taken place before, even in periods of frenzied buying before a strike.

The feeling at the National Coal Association is that the producers have a right to protest against any such rigging of the coal market to the advantage of the buyer. Producers and consumers of coal alike are agreed that the trade needs figures on stocks more than any others, but it is regarded as obvious that these figures should be compiled and published by a neutral agency that could have no interest in doctoring the results.

In the Dec. 4 issue of *Coal Age* the National Association of Purchasing Agents stated that the amount of hard and soft coal in storage in the bins of users in the United States and Canada as of Nov. 1 was 77,754,068 net tons, an increase of 25,285,343 tons over Oct. 1. These figures should be corrected to read 57,754,068 tons and 5,285,343 tons respectively.



## Spread of Central Heating Foreseen in Canada

Central and district heating, having shown economies, probably will be adopted to an increasing extent in Canada, according to a report by the Dominion Fuel Board following a recent investigation. In addition to the saving effected by the substitution of low-grade fuels and refuse, other advantages are the elimination of smoke, dust and dirt, reduced fire risk, ease of regulation, uniformity of temperature, relief of street traffic from coal and ash haulage and appreciation in value of property.

One of the essentials to success in district heating, the report points out, is density of load, and for this reason it cannot be successfully adopted in towns of less than 4,000 population, and if other conditions are not favorable, the minimum population for economic operation is 10,000.

The cost of service can be lessened sometimes by combining the heating plant with a steam electric generating or an industrial plant. Even in the most efficient steam engines and steam turbine generators only 15 per cent of heat in the steam is utilized for heating. At the district heating plant at North Battleford, Saskatchewan, for instance, exhaust steam from the municipally-owned steam electric generating system is used for heating.

The benefits to be derived by consumers, the report states, are not so much in cost as in increased convenience, cleanliness and relief from handling ashes. A great deal depends, it is pointed out, on the cost of fuel available, but under ordinary conditions it has been generally established that to give the heating company a reasonable return a rate must be charged for dwellings in excess of the cost of fuel for individual heating.

Among the interesting facts brought out by the inquiry is the fact that despite its hydro-electric power development the province of Ontario consumes 60 per cent of the coal requirements of the whole Dominion. Another curious fact is that in spite of the difference in temperature coal consumption for heating buildings in Canada is slightly less than in the northern United States. In

## Coal Review Discontinued

*Coal Review*, published weekly for several years by the National Coal Association, will be discontinued after the issue of Dec. 24, 1924, and in its stead Saturday bulletins direct to the membership of the association will be resumed and news releases for Tuesdays, covering statistical, traffic and other information of the association, will be prepared for coal trade and other papers, according to announcement by Harry L. Gandy, executive secretary of the association. A monthly résumé of news will be furnished to monthly trade papers.

"*Coal Review* was established in March, 1920," says Mr. Gandy, "when there was urgent need for the publication of such a magazine by the National Coal Association. Conditions have changed, however, and, that need having passed, the executive committee decided the field would be thoroughly served by the other coal trade publications. This change of association policy, it is believed, will result in a more intimate contact between the Washington office and the membership, and in an increasingly helpful and friendly relationship between the association and the various trade and other papers.

"C. B. Huntress, associate editor of *Coal Review*, will be director of information service for the association and will be available to trade and other publications not only in respect to the weekly news release but for special articles and the covering of special events. The program of the association contemplates a wide range of information service concerning the bituminous coal industry."

fact in the heating of dwellings it is appreciably less. This, it is stated, is due to better building construction and the use of double windows in Canada; to the greater use of hot water radiation and to the fact that Canadians are used to lower indoor temperatures than are people of the northern states.

## British Coal Industry Prosperous in 1923, Due Mainly to Ruhr Upset

Owing mainly to the dislocation of production from the Ruhr coal field, 1923 was a prosperous year for the British coal mining industry, states the third annual report of the British Secretary of Mines, recently issued. Output was higher than in any previous year, except 1913; exports surpassed even that "record" year; prices were good and earnings improved on the low level of the preceding year. Output in 1923 totaled 276,000,000 tons, compared with 249,666,666 tons in 1922 and 287,500,000 tons in 1913.

Employment during 1923 was good. At the beginning of the year only 4.5 per cent of the insured coal miners were unemployed, and at the end the number had fallen to 2.4 per cent. This decline was reflected in the increased number of wage earners on colliery books. At the end of 1922 they numbered 1,129,539, and a year later they totaled 1,184,786. Coal was wound at the pits on 277 days on the average, or 15 more than in 1922.

### Home Consumption Drops

The prosperity of the export trade last year was chiefly attributable to the occupation of the Ruhr. Seventy-eight million tons of coal (excluding 1,485,000 tons shipped to Irish Free State ports during April to December) and 4,000,000 tons of coke were exported during the year, as compared with 73,500,000 tons of coal and 1,250,000 tons of coke exported in 1913, which was the highest level previously recorded. The British home consumption of coal was less by 15,000,000 tons than in 1913, although the quantity available was 11,000,000 tons more than in 1922.

In a long comparison of the results of the operation of the national wage agreement between the years 1922 and 1923 the report shows that though there was an improvement last year in both the gross proceeds per ton and in "costs other than wages," the average increase in the actual wages paid was only about 2d. per ton, or 1d. per shift.

## West Virginia Coal Mining Institute

With its spirits unruffled by the heavy technical diet which the program committee had provided. However, it must be remembered that this was taken at "recess" when spirits bowed down by rock dust, pneumatic separation and electrification of gaseous mines were let loose to contemplate less serious matters.





## Coal Output in Canada Up In September, but Still Behind 5-Year Average

Output of coal from Canada mines during September, 1924, according to a report by the Dominion Bureau of Statistics, amounted to 902,595 net tons, an increase of 28 per cent over the tonnage for the previous month, but 35 per cent below the average for the month for the past five years. The greatest increase was 132,000 tons in Alberta to a total of 265,000 tons for the month. The remaining provinces in order of their gains in output were Nova Scotia, up 66,000 tons to a total of 471,000 tons; New Brunswick, 6,000 tons increase to 18,000 tons in all, and Saskatchewan, 1,000 tons more with 17,000 tons output. British Columbia's output declined from 137,000 tons to 132,000 tons.

Comparison of September and August figures covering the total importation of coal from the United States and Great Britain shows an increase of 1 per cent. September imports amounted to 1,587,613 tons while in August 1,557,141 tons was brought in. The September importations this year were 11 per cent lower than the five-year average for the month. During the month 13,620 tons was imported from Great Britain. Total importation of coal for the nine months of 1924 was 12,165,436 tons, or only 7 per cent below the preceding five-year average for the period.

The imports of anthracite for September totaled 327,949 tons. This was slightly less than in August, and about 1 per cent less than the five-year average for the month. Anthracite imported from the United States amounted to 314,329 tons, while 13,620 tons came from Great Britain. The total amount of anthracite imported during the nine months of 1924 was 2,969,224 tons, a decrease of 8 per cent from the five-year average for this period.

The exports of Canadian coal for September were 13 per cent lower than in August. The quantities were: September, 55,353 tons, and August, 63,415 tons. Comparison of the September exports with the preceding five-year average showed a decrease of about 67 per cent. Exports from the eastern provinces amounted to 35,297 tons, an

## New Stunt in Canada

The formation by a vote of 290 to 10 on Dec. 7 of a British Columbia miners' association by Crows Nest Pass Coal Co. men who quit the union represents an interesting experiment. The agreement between the men and the company, reported in *Coal Age* last week, calls for a wage 55 per cent above 1914 scale and slightly above that now paid on Vancouver Island. This means about \$5.20 per day. Contract men are expected to earn about \$8 a day. The new contract runs four years but the company agrees to increase wages if business justifies it. The company's mines have all been shut down because of lack of trade.

increase of 636 tons above August; those from the western provinces amounted to 20,056 tons, a decrease of 8,698 tons below August. The cumulative exports for the year to date amounted to 537,551 tons or 64 per cent less than the five-year average.

Computed from figures on output, imports and exports, the quantity of coal made available for consumption increased about 18 per cent above the figures for the previous month. During September the total was 2,434,855 tons as against 2,196,346 tons for August. In comparison with the five-year average for the month, the September available tonnage was lower by 19 per cent. The total coal made available for use in the first nine months of 1924 amounted to 20,777,022 tons and for the twelve months ending Sept. 30 the total coal made available for consumption was 29,910,548 tons.

The total number of men employed in the coal mines of Canada during September was 21,639, of whom 16,492 worked underground and 5,147 on surface, as compared with a total of 19,280 in August, of whom 14,682 worked underground and 4,598 on surface. The monthly production per man was 41.7 tons for September as against 35.4 tons per man for August. During September the production per man-day was 2.3 tons, as compared with 1.9 tons in August. The tonnage lost was due largely to lack of orders in September.

## This Union State Increased Its Coal Output

Arkansas produced 204,240 tons more of coal during the fiscal year ending last June 30 than it yielded the previous year, according to the report of Jesse Redyard, state mine inspector. The 192 mines of the state, of which only 80 were active, raised a total output of 1,298,791 tons. Of the inactive mines 63 were idle and 49 abandoned. Of the total, 101 are slopes, 44 are shafts, 16 are strip pits and 1 is a drift mine. The underground mines are ventilated thus: 78 by exhaust fans, 31 by furnaces and 53 by natural ventilation. Men employed totaled 3,597, 95 of whom were hurt during the year. The production per fatality was 593,896 tons and per non-fatal accident, 12,503 tons.

## Seek Greater Safety in Hard Coal Mines

Mine inspectors, representatives of the coal companies and representatives of the mine workers of the anthracite field will meet in Wilkes-Barre, Pa., on Feb. 24, 1925, for the purpose of discussing various methods of preventing and reducing fatalities and accidents in the hard coal mines. Officials of districts 1, 7 and 9 of the United Mine Workers will be invited to the meeting. A detailed program relating to subjects of importance to all engaged in the mining industry is being arranged. Among the papers to be read are "Falls of Roof," "Accidents from Mine Cars," "Premature Blasts," "Exploding Gas" and "Mine Fires." Several speakers of national repute will address the meeting. The meeting is being arranged under the auspices of the National Safety Associations. S. D. War-riner will secure the representatives of the operators.

## Confirm Meyer and Campbell

The Senate on Dec. 10 confirmed the nominations of Commissioners B. H. Meyer and J. B. Campbell, whose names had been sent by President Coolidge for reappointment as members of the Interstate Commerce Commission. Their present terms expire Dec. 31.

## Bituminous Coal Loaded Into Vessels at Lake Erie Ports During Season to End of November

(In Net Tons)

Ports	Railroads	1924			1923			1922		
		Cargo	Fuel	Total	Cargo	Fuel	Total	Cargo	Fuel	Total
Toledo.....	Hocking Valley.....	6,531,303	194,032	6,725,335	5,003,169	150,612	5,153,781	3,195,480	91,530	3,287,010
	Big Four.....	57,298	138	57,436						
	N. Y. C.-Ohio Central Lines.....	135,399	5,090	140,489	1,179,147	36,815	1,215,962	848,157	27,141	875,298
Sandusky.....	Baltimore & Ohio.....	2,154,306	66,808	2,221,114	2,861,500	83,889	2,945,389	2,814,496	75,895	2,890,391
	Pennsylvania.....	4,152,278	125,120	4,277,398	3,005,405	95,418	3,100,823	2,695,899	97,303	2,793,202
Huron.....	Wheeling & Lake Erie.....	790,494	36,264	826,758	1,471,905	58,169	1,530,074	413,682	16,753	430,435
Lorain.....	Baltimore & Ohio.....	2,218,245	158,610	2,376,855	3,643,163	194,893	3,838,056	1,798,619	90,969	1,889,588
Cleveland.....	Pennsylvania.....	1,412,762	175,782	1,588,544	1,850,573	198,975	2,049,548	1,024,802	91,394	1,116,196
	Erie.....	327,720	11,336	339,056	739,025	31,920	770,945	381,903	14,208	396,111
Fairport.....	Baltimore & Ohio.....	550,702	84,394	635,096	880,389	80,118	960,507			
Ashtabula.....	New York Central.....	868,915	112,296	981,211	3,322,902	253,537	3,576,439	1,472,339	86,792	1,559,131
Conneaut.....	Pennsylvania.....	1,183,630	78,463	1,262,093	2,083,379	91,037	2,174,416	1,623,878	88,638	1,712,516
	Bessemer & Lake Erie.....	1,502,672	196,727	1,699,399	2,781,553	240,553	3,022,106	1,546,725	61,850	1,608,575
Erie.....	Pennsylvania.....	684,669	85,802	770,471	717,240	93,489	810,729	198,110	70,383	268,493
Total.....		22,570,393	1,330,862	23,901,255	29,539,350	1,609,425	31,148,775	18,014,090	812,856	18,826,946
*1923 Storage Loading.....		182,060	4,940	187,000						

\* Coal loaded into vessels in December, 1923, after close of navigation and forwarded from Lake Erie Ports during 1924 season of navigation.

† Lake coal into Toledo over Big Four Route and dumped by Ohio Central machine.

‡ Includes 2,578 tons amalgam coal.

Compiled by Ore & Coal Exchange, Cleveland, Ohio; H. M. Griggs, manager.



## Bain's Annual Report Outlines Year's Work Of Bureau of Mines

Accidents in the coal mines of the United States, with their consequent train of deaths, injuries, and tremendous property losses, continue to be too frequent despite the results of modern research which have demonstrated clearly the principal causes and definite means of minimization of such accidents, Director H. Foster Bain of the Bureau of Mines points out in his annual report to the Secretary of the Interior.

For the 13 years 1911 to 1923, inclusive, the Bureau's records show 23,822 lives lost through all classes of accidents at bituminous mines in the United States. Explosions of gas and coal dust caused 3,185 deaths, or 13 per cent of the total. Most of the larger explosions were propagated through the mine workings by coal dust chiefly and therefore coal dust was responsible for the greater part of the loss of life. This extension of an explosion throughout a mine can be stopped even if all initial explosions are not prevented.

Despite the general good will of miners, mine operators, state inspectors and manufacturers of explosives and machinery the tested recommendations of the Bureau have not been adopted in the mines as rapidly or as broadly as is necessary if the loss of lives is to be stopped, the report declares. Consequently, although there has been real progress, as in the decreased loss of life due to accidents from explosives, the death rate from gas and dust explosions is now as great as ever. One state, Utah, following a mine disaster that caused the loss of 171 lives, has adopted every practical tested method of preventing or limiting gas and dust explosions, and is having these methods introduced in the mines as rapidly as possible. An active campaign of field demonstrations is necessary to bring home to those in other states the danger that has become so familiar as to be frequently overlooked and to show that effective precautionary methods are known and available.

The dominant features of the Bureau's efforts during the year to increase safety in mining have been the development of international co-operation with the Mines Department of Great Britain for research looking to the reduction of mine accidents; an intensive campaign for the adoption of rock dusting as a preventive of disastrous explosions in bituminous coal mines and an extensive study relative to the safe use of electricity in coal mines.

The Bureau of Mines considers that had the coal mines of the country in past years followed the principle of rock dusting the mines as a means of preventing the spread of explosions many large mine disasters would not have occurred and hundreds of lives could have been saved. In view of the large number of deaths from explosions during and since 1922 the Bureau urges that the practice of rock dusting be adopted as soon as practicable in all bituminous mines in which dust constitutes a hazard.

Ever since its establishment the Bureau has strongly urged the use of

## Bed of Dried Up Waterway Proves Coal Mine

Although the prolonged period of dry weather has helped the coal business in some localities it has proved the opposite in certain sections of New Jersey near the abandoned Morris Canal.

Persons living along it at Hackensack and Port Murray made the discovery recently that the dry bed of the waterway contains tons of coal which dropped from passing barges in the years that mules towed craft down the canal. At some places boats must have overturned, for mounds of coal have been found.

News of the discovery spread rapidly, for scores of persons, some from as far away as ten miles, quickly began gathering up coal.

"permissible" explosives in all coal mines where there is any hazard from gas and dust, and the amount of "permissibles" used has steadily increased. However, while this increase has been steady, the replacement of other explosives by "permissibles" has not been as rapid as it should be, in view of the known effectiveness and greater security of "permissibles."

During the fiscal year the Bureau studied the possibilities of radio as a means of establishing communication between miners trapped underground following mine fires and explosions and rescue parties on the surface. The results give some promise of the possible development of a satisfactory system of communication through what is known as line-radio, which utilizes metal piping, wiring, car tracks and other permanent metal equipment as carriers for the voice.

A lignite carbonizer recently designed by the Bureau after extensive investigations should, it is believed, result in the ultimate solution of the tremendously important problem of economic utilization of the lignites of the Northwest. These lignites comprise nearly one-third of the total solid fuel resources of the United States.

## State Mine Inspector Wants Colorado Made Safer

A new coal mining safety code for Colorado is embodied in a bill which James Dalrymple, state mine inspector, has prepared for the next session of the Legislature. It follows along the lines laid down in the strict Utah state mining code adopted in that state after the Castlegate mine blast. Mr. Dalrymple would insist upon rock dusting and adequate sprinkling and would make a number of other safety practices compulsory. Incidentally he wants his own office and staff placed under civil-service regulations.

The suggested legislation would require that superintendents be held equally responsible with mine foreman for safe conditions underground; that all mine officials pass periodic examinations for competence; that coal-cutting and coal-loading machines be equipped with water lines to reduce dust; that open-flame lamps be barred; that every man entering a mine shall be searched for "intoxicating liquors, matches, pipes, cigars, cigarettes or any device for making lights or fire not authorized or approved"; that all shotfirers be certified, that they must always test for gas and never fire a shot in an atmosphere where gas can be detected by a safety lamp; that no explosives be used except permissibles and the quantity per shot be limited and that all shot-holes be tamped to the mouth with clay or other incombustible.

## Dusting or Sprinkling Required

Rock dusting would be required from mine openings to room necks, on all haulageways, aircourses and active entries, with dust barriers at strategic places. The law would give the inspector power to shut down any mine which did not keep its dust in the mine up to the required safety proportion. But it would be permissible for mines which did not rock dust to maintain safety by sprinkling liberally throughout a mine so that its coal dust should at all times contain at least 30 per cent water by volume.



Special Man Trip at Gary No. 6 Mines

This trip with cars covered with white duck for the occasion took the members of the West Virginia Coal Mining Institute into the mines to see the O'Toole cutting and loading machine.



## Equal Opportunity for All in Business Is Aim of O. D. Young, Says Hoover

More than 1,000 leading men in all fields of endeavor accorded a remarkable tribute to Owen D. Young, co-author and first administrator of the Dawes plan, at a dinner in the Waldorf-Astoria, New York City, Dec. 11. Among those who lauded Mr. Young for his part in the economic reconstruction of Europe was Herbert Hoover, Secretary of Commerce, who spoke as follows:

"The German reparations had become one of the world's most dangerous inheritances from the war. The sequent failures in its adjustment had poured an increasing stream of conflict into international life, carrying with it political jeopardy and economic demoralization with its train of millions of unemployed and suffering.

"The accomplishment of its settlement involved great economic questions of production and distribution, of currency, of credit, of taxes, and of exchange. Solution has been found in denominations of money and goods, in the creation of complex agencies of finance and government. But there springs from the settlement something far greater than the denomination of these quantities and the working of this machinery of government. It has turned millions of men from discouragement to hope. It has revived the forces of courage and enterprise. It has done even more. It has defeated the forces of hate, and advanced the tide of peace in the hearts of men.

### Adjustment Is Far Reaching

"While this adjustment primarily advances the welfare of the nations of Europe, it reaches far afield in the world. Unemployment and suppressed production anywhere in the world are in the long view a world loss. This restoration of confidence and hope and enterprise, this restoration of commerce, of productivity, and of employment, this relief of suffering in a great nation, is a world asset. As a people we also participate in its blessings. Some part of our growing demand for labor, some part of the increased prices already realized by our sorely distressed agriculture, have come from this restoration of economic vigor and hope in Europe. It is a great thing to have contributed so much to this achievement.

"The wounds to our complex and intricate civilization from the war were so deep and so vital that many had despaired lest statesmanship would be unequal to their healing. Six years since the armistice seems a long time to those who live it and partake of its anxieties. Six years is a trifle in human history, and yet within it, one by one, these great problems of reconstruction have been solved. Surely in this new accomplishment for which we justly give tribute tonight we see again renewed confidence, hope and faith in human institutions. There are indeed many problems yet unsolved, but none of those before us are as dangerous to the restoration of civilization as those

that have already been successfully met in these six years.

"Some have doubted whether the enormous liabilities established under this settlement can be discharged. There are those who have contended that no great external contributions from one nation to another can be economically sustained. Without debating this question I may be permitted to offer one thought in this connection. The payments provided in such settlements must find their substance from production and economic services rendered. These international obligations are huge burdens, but in the course of years any burden shrinks in weight in proportion as the productivity of a nation grows. When the world keeps peace it doubles its international trade once in nearly every score of years.

"The processes of industry and commerce are the cells which heal the injuries of the economic world. They cannot multiply in the noxious air of conflict and political uncertainty. The settlement to which our guest has contributed so much clears the atmosphere, and the magical multiplication of these cells will quickly provide the strength to meet the burdens—if the world keeps the peace.

"But beyond even these special occasions of vivid public service, Mr. Young has made a still further contribution to American life—perhaps the greatest of all his contributions. That is in his display of the fine sense of the responsibility which today rests upon those who administer our largest industries.

### Would Preserve Initiative

"Manufacture and distribution on a vast scale is the foundation of our high standard of living and the general comfort of our people. It can be accomplished in no other way than through the development of great units of production. With their development have come innumerable problems of public relationship and public responsibility. We are in fact today witnessing a rapid evolution and perhaps a silent revolution in the relationship of great business to our social system. We are struggling to preserve the fundamental stimulus of action, of initiative and competition, to hold open the avenues of opportunity. At the same time we are struggling to gain the benefits of co-operative action.

"In this period of evolution nothing is more needed than clear vision of their public responsibilities on the part of our industrial leaders. For here is a triple trusteeship—a trusteeship to the owners who ultimately must be comprised from the savings of those who endeavor to provide security for their dependents and for their old age. These must have proper stimulative return as a reward for their enterprise and their self-denial. There is the trusteeship for a vast body of employees that they should have stability in employment and a sense of security for work conscientiously performed, that they should have a growing standard of living and comfort, and full

### Postponed Again

Secretary McGinty of the Interstate Commerce Commission announced last week that the commission has decided to postpone further the effective date in the so-called assigned coal car case—Docket 12530. The order, which was to have become effective Dec. 15, has now been deferred until Jan. 15, 1925.

opportunities for recreation and education.

"There is an equal trusteeship to the whole public who are served by the products of these enterprises. It is in the public interest that the product should be multiplied; should be given with every advantage of technical excellence and service and upon the best terms which can be attained with due regard to the two other strong obligations toward which our leaders must also look. This trusteeship goes even further. Constant gains to each group depend upon the elimination of waste and the constant development of science and invention, of increasingly more efficient organization. Beyond this again these organizations must be held high in the business and ethical relations by the character of their leaders. They must be conducted in a fine sense of non-interference with human rights.

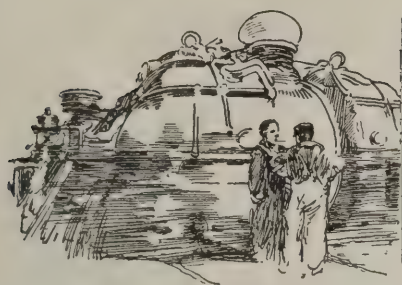
"I know of no responsibility larger than that imposed upon the headship of great industries, for from their leadership and their vision must come not only great contributions to our economic progress but upon it depend the solution of the many social problems which confront us. We have a real and growing measure of this sense throughout American industry. And Mr. Young has been the expression of this type of leadership.

"There is one final thought to which I should like to give expression. Our friend and his colleagues in entering upon this mission to Europe, and in contributing so much to its high accomplishment, occupied the unique position of private citizens. Mr. Young is honored tonight as a private citizen. Does this not illuminate the potency and possibilities of private citizenship in a real democracy? Here is a world service of sublime accomplishment rendered by individuals bearing none of the trappings of public office but who nevertheless were accepted as the representatives of the intelligence and instinct, good will and faith of the American people—and represented it to the pride of their countrymen."

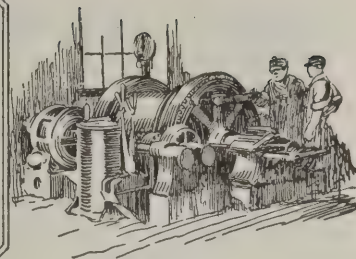
### New Haven R.R. Opens Bids

Bids opened Dec. 15 by the New York, New Haven & Hartford R.R. for 360,000 to 410,000 gross tons of high-volatile run of mine bituminous coal, to be delivered in substantially equal monthly quantities between May 1, 1925, and May 1, 1926, disclosed twenty-one tenders from twelve bidders. The quotations ranged from \$4.80 to \$5.50 per gross ton alongside, Boston. This is the second set of bids submitted, the first batch, opened Nov. 17, having been rejected.





## Practical Pointers For Electrical And Mechanical Men



### By Large Mandrels Old Locomotive Motor Frames Are Made Like New

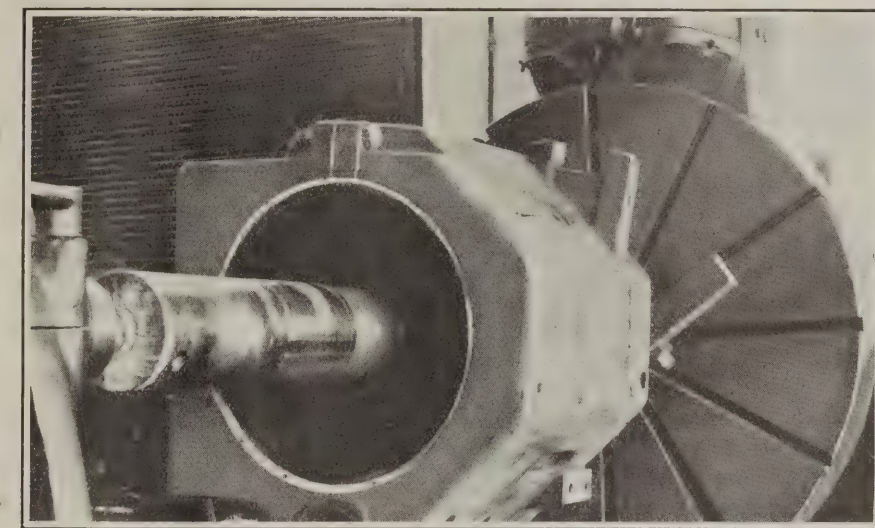
**Pittsburgh Coal Co. Brings All Worn Equipment up to Standard—  
Uses Mandrels to Fit All Types of Motors—Large  
Stock of Repaired Parts on Hand**

EVERY MINE electrician or mechanic concerned with the upkeep of old equipment knows the difficulties which arise when the motor cases of mine locomotive motors become worn so that the bearing housings and axle brasses do not fit properly. Such difficulties as arise can be overcome by the use of over-sized parts, however this is highly unsatisfactory because most of these over-sized parts are more expensive and their use complicates the economical and expedient handling of repair work.

Even though a mining company has a lathe or boring mill large enough to accommodate a motor field frame it is difficult and time-consuming to set up the frame properly so that the machining will be true. The Pittsburgh Coal Co. makes a practice of building all worn equipment up to standard and also has solved many of the difficulties of chucking. Mandrels to fit the various types of motors have been provided.

#### FIVE MANDRELS USED

Fig. 3 shows one of the five mandrels used at the company's central shop at Library, Pa. By the use of shoes or liners one mandrel may be adapted to several sizes. The stock of five mandrels and several sets of shoes takes



**Fig. 2—Motor Frame Set Up in the Lathe Ready for Work**

The use of the mandrel on which a locomotive motor frame is clamped reduces the work of setting up the frame in the lathe to a fraction of that necessary were it to be chucked, and makes it easy to center the piece. The end of the frame has been bored ready for a ring bushing. The bushing is then bored to factory standard.

care of all the sizes of locomotive motors that the company uses.

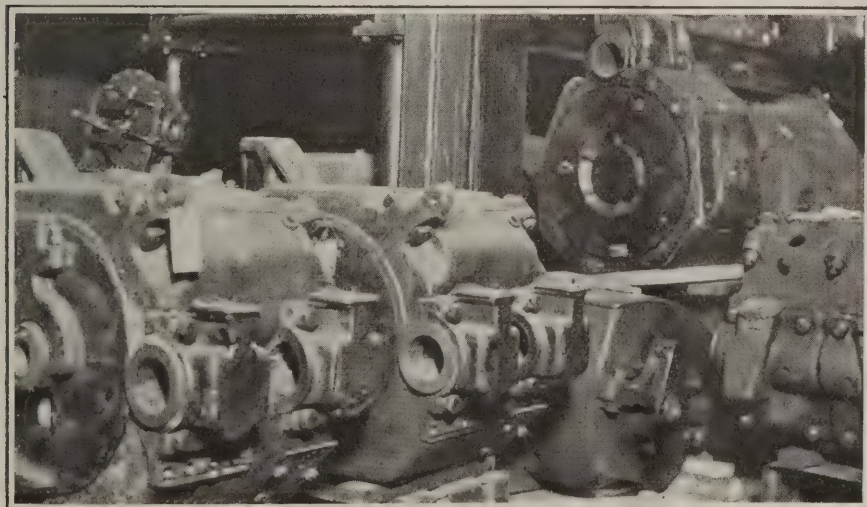
A large motor field frame clamped on to a mandrel and swung in a lathe

being fastened in place by electric welding. This process requires that the frame be machined twice, once to bore out the worn part ready for the bushing and again to bore out the bushing to true center. This same procedure is followed in repairing worn axle boxes so that the standard size brasses can be used, but in this case the machining is done by a jig, in a horizontal boring mill. In the background of Fig. 1, can be seen on the ends of two motor cases, how the bushings are welded in place.

#### MANY MOTORS REPAIRED

An idea of the extent of this kind of work which is being done in the Library shops may be gained from the photograph, Fig. 1. This is only part of a group of locomotive motors which have been repaired and have been placed in the stock room adjacent to the shop. Albert Hasson, shop superintendent, explained that these motor cases are complete with field coils, and as all parts are standard, they can be sent on short notice to any of the mines in exchange for frames which have given trouble and are to be sent to the shop for repair.

Such work as this cannot be done



**Fig. 1—Part of the Group of Spare Motors in the Storeroom**

When the motor of a mine locomotive gets into bad condition a repaired motor is sent out from the shop and the damaged one returned for repairs. After the motor is overhauled and any badly worn parts built up to standard, this motor goes into stock.



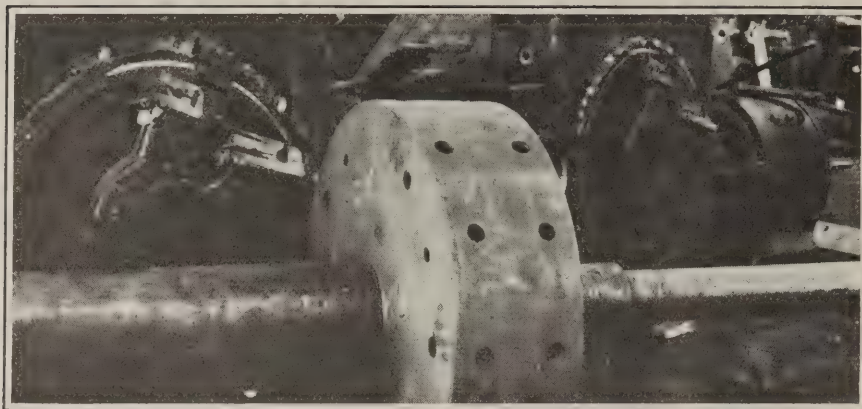


Fig. 3—Mandrel Used for Swinging Motor Case in Lathe

In the foreground is one of the five mandrels used in the central repair shop of the Pittsburgh Coal Co., Library, Pa. Just back of the mandrel can be seen the ends of two motor field frames which have been repaired. A large ring bushing has been inserted and fastened by electric welding.

economically anywhere else than at or near the mines; the cost of handling and shipping motor frames to distant points is prohibitive. Just as soon as

other companies start this kind of repair service for their electric equipment they will begin to reduce the number of armature burnouts.

### Simple Shear and Bender For Chute Plates

A handy little tool used about the shop is the combination punch and shear pictured in Fig. 1. The stand is a home-made affair. Some pipe, some

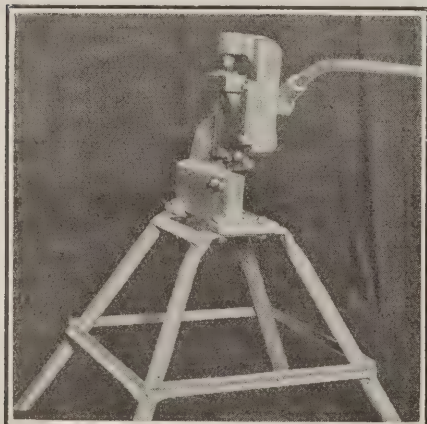


Fig. 1—Boltless Stand

Here is the home-made stand upon which is mounted the punch and shear. The frame structure was welded together in a short time.

angle iron, bars, and a welding outfit were the only material necessary. Two pieces of pipe were cut to length, then heated and flattened for a short distance in the middle. They were bent so that when placed in position the legs had a good, stable spread. The two pipes were held in this position, properly spaced at the top, with reference to bolt holes already cut, and shear punch mounted. Thus a strong base was made in about an hour.

The apparatus partly shown in Fig. 2 is a home-made sheet bending machine which will make any internal angle from 30 to 130 deg., and is the product of the ingenuity of the managers of this sheet metal shop and the flexibility of welding processes. The shop had received a rush order for some rectangular tanks. Neat bends must be made in wide sheets. Inquiry was made for a sheet bender, but it

could not be delivered for three weeks. This was almost as long as the time allowed for delivery of the tanks.

In this dilemma it was decided to make a bending machine at home. After about two days' intermittent work, the machine illustrated was produced. It consists of three 6x6½-in. angles mounted on a welded pipe frame. The sides of the angle legs, which come in contact with the sheet, are faced.

The back or base angle is welded to the frame; the top angle closed to 30 deg. and suspended in vertical bars at each end. That is to say, a bolt is secured in a piece welded into each end of the angle. This bolt passes through a slotted hole in a vertical bar attached to the pipe frame, and ends in a disk to which a handle is fastened. This disk also has a pin set in it off center, which projects into the vertical bar and acts as a fulcrum. Thus, when the handle is moved, the angle is lifted or lowered to pass or lock a sheet between it and the base angle.

The third or bending angle is hinged back to back with the base angle. It

is trussed, as shown in the illustration, and is equipped with handles by which it can be rotated.

The bending apparatus is shown in position ready for the insertion of a sheet. When the line of bend is directly above the heel of the base angle, the upper one is lowered and clamped down to the sheet, then the bending angle is swung up until the required bend has been made.—*Oxy-Acetylene Tips.*

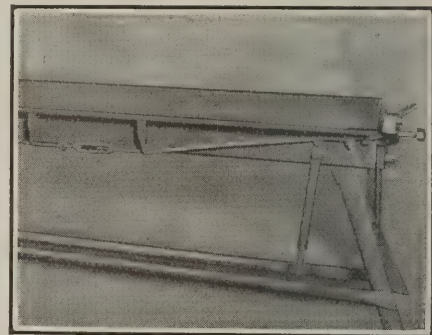


Fig. 2—Welded Parts for Bender

All mining plants at some time or another must replace chutes or screens. Some think it is difficult to shape sheet-iron, but here is a machine made at the mines which makes the work easy.

### Fan Exhaust Supplies Heat For Wash Water

At the O'Gara No. 12 mine near Harrisburg, Ill., exhaust steam from the steam-driven fan is used to heat the wash water in the bath house.

The complete housing and airway of the fan is constructed of concrete. At the end of the fanhouse is a large steel tank into which the exhaust from the steam engine discharges. Water, supplied from a reservoir nearby, circulates through this tank and is thus warmed. The heated water is then conducted to the wash room.

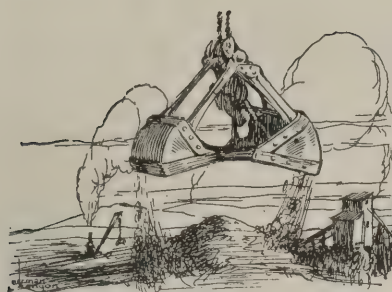
The method of heating is similar to that used in many boiler plants for heating feed water. Fans, being the most continuously operated machines around a coal mine plant, consume much power and therefore savings effected by devices attached to fans quickly mount into large figures.



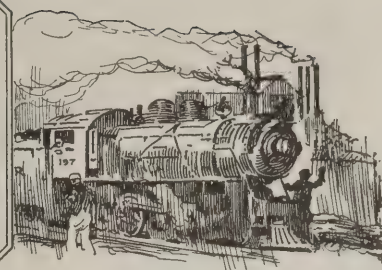
Water-Heating Tank Conserves Wasted Energy

Wash water for the bathhouse is heated at the O'Gara No. 12 plant by the exhaust from the fan engine. Warm water is always available because the fan operates continuously.





# Production And the Market



## Seasonal Lull Hits Bituminous Coal Market; Caution Marks Anthracite Trade

Snappy weather throughout a large portion of the Middle West has injected some much needed vim into the steam coal business of that locality though domestic demand is somewhat slow when considered in relation to output. Trade in the Southwest also shows some improvement with a dip in the temperature. Little of outstanding interest marks the trade in other sections, which is of a spotty character, varying from minor gains at Pittsburgh to sagging tendencies in Kentucky. Indifference seems to be the attitude in Ohio, Atlantic seaboard and New England markets. On the whole the industry apparently is suffering from a seasonal lull that seldom fails to appear at this time of the year. The real unsettling element, of course, is the closing of lake navigation.

About the only feature of strength in the market is in screenings, which are in somewhat limited supply with consequent firmness in price tendency. The dearth is not due to any growth in demand, however, but is merely the natural corollary of the curtailed call for lump. Monthly government surveys of industrial conditions continue to show increased employment in most sections, save in New England, where the situation is not changing much.

### Moderate Demand for Anthracite

Demand for hard coal is marked by extreme caution, orders being fitful and in small lots. Yards are well stocked except for stove, the call for which is so steady that some operators are breaking down egg to keep pace with the demand for the more popular size. Chestnut also is quite strong, in some instances commanding the same price as stove. Egg and pea are in difficulty, however, some producers sending pea to storage piles.

Steam sizes are rather quiet, especially buckwheat No. 1; rice and barley are somewhat more active. With the falling off in demand it is probable that but for the curtailment of output by outlaw strikes there would be a softening in independent prices.

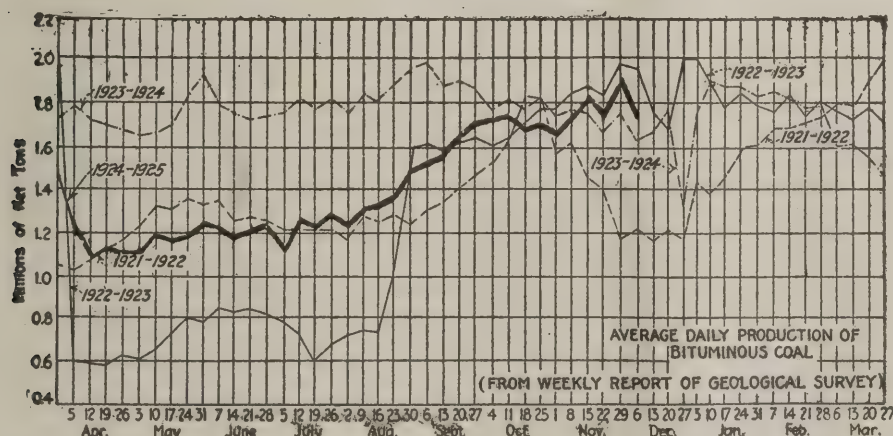
Within the last few weeks more than 5,000 mine workers have sailed from New York for their native lands to spend the holiday season and in many instances the entire winter months. It is expected that before the year ends the number will have been increased to nearly 10,000 mine workers and their families.

Coal Age Index of spot prices of bituminous coal has taken another tumble, standing on Dec. 15 at 169, the corresponding price for which is \$2.04, compared with 171 and \$2.07 respectively for the preceding two weeks.

### Hampton Roads Dumpings Heavy

Another marked increase in activity took place at Hampton Roads, dumpings of coal for all accounts during the week ended Dec. 11 totaling 479,099 net tons, surpassing the high mark of the previous week by 43,377 tons.

Bituminous coal production advanced substantially during the week ended Dec. 6, when, according to the Geological Survey, 10,612,000 net tons was produced. This was an increase of 972,000 tons—as shown by revised figures—over the preceding week, when operations were curtailed by the observance of Thanksgiving Day. Incidentally this was the fourth consecutive week in which output exceeded that of the corresponding week of last year. Anthracite output also turned upward after the holiday, the total for the week ended Dec. 6 being 1,814,000 net tons, compared with 1,611,000 tons during the previous week.



### Estimates of Production

(Net Tons)

#### BITUMINOUS

	1923	1924
Nov. 22.....	10,160,000	10,559,000
Nov. 29 (a).....	8,943,000	9,640,000
Dec. 6 (b).....	9,829,000	10,612,000
Daily average.....	1,638,000	1,769,000
Cal. yr. to date (c)...	514,200,000	433,797,000
Daily av. to date.....	1,791,000	1,510,000

#### ANTHRACITE

Nov. 22.....	2,031,000	1,827,000
Nov. 29.....	1,691,000	1,611,000
Dec. 6.....	1,837,000	1,814,000
Cal. yr. to date (c)...	87,952,000	84,652,000

#### COKE

Nov. 29.....	245,000	158,000
Dec. 6 (b).....	265,000	173,000
Cal. yr. to date (c)...	17,150,000	8,938,000

(a) Revised since last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.



### Midwest Screenings Stiffen

Slow domestic demand in proportion to the available production has caused a strengthening of the steam market in the Midwest. Central Illinois fine coal has advanced to \$1.75, which gives it an edge over the higher grade southern Illinois screenings because of its short rate to the great consuming market in Chicago. Southern Illinois 1½-in. coal brings an average of \$1.60 and 2-in. about \$1.75.

The weather throughout the central region is snappy, running to bluster, but this has induced very little domestic business in most territories, at the same time increasing the tendency to produce coal. This combination has nearly broken down circulars on lump and egg, but hope for immediate cold weather staved off this calamity. The unsettled freight rate situation from the East to the Northwest causes a good deal of uncertainty in the market for Illinois and Indiana coal in Wisconsin and Minnesota.

Southern Illinois egg is hard to move and nut is worse, and the poor working time in the last couple of weeks has put all mines behind on their screening business. Mines that had been getting two and three days a week are doing better now, but they are piling up coal hoping for a cold wave. Strip mines continue to do well. Cars are plentiful, movement good and railroad tonnage fairly good. In the Duquoin-Jackson County field conditions are somewhat similar to those in the Carterville district excepting that coal is not moving as freely and working time is not as good.

The quietness that has prevailed in the Mt. Olive field was broken this week with the movement of domestic coal. Some of this is moving to the Northwest and some locally, while steam is moving to Chicago. In the Standard field there is little activity. A little coal is always moving but large volumes are on hand and prices are about cost or below. Mines are getting from one to three days a week. Railroad tonnage is light and pessimism covers the field. The only thing in this district that shows any change is screenings, which range from \$1.10 to \$1.25.

In St. Louis a little cold weather and a little more demand, principally for the middle grades of coal, is all that can be reported. There is practically no demand for anthracite or smokeless and coke is just a trifle better. Cold weather, of course, forces the poorer classes to buy coal and this usually is Standard, but this business is not in the volume that would be expected. Dealers' yards are all loaded. Local wagonload steam is good. The trucking of coal over the Free Bridge from East St. Louis is now under way in order to overcome a 45c. differential rate in the freight rate of coal from East St. Louis. This movement is still small but threatens to grow.

### Kentucky Prices Sag

Last week saw the weakest coal market in many weeks in Louisville, demand being light and offerings heavy. Screenings are holding firmly due to reduced production of prepared sizes in both fields. The small prepared sizes that

### Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern		Market Quoted	Dec. 17 1923	Dec. 1 1924	Dec. 8 1924	Dec. 15 1924†
Smokeless lump.....	Columbus...		\$3.35	\$4.10	\$4.10	\$4.00@ \$4.25
Smokeless mine run.....	Columbus...		2.10	2.00	2.00	1.75@ 2.25
Smokeless screenings.....	Columbus...		1.25	1.25	1.25	1.20@ 1.35
Smokeless lump.....	Chicago...		3.35	3.85	3.85	3.75@ 4.00
Smokeless mine run.....	Chicago...		1.80	1.85	1.85	1.75@ 2.00
Smokeless lump.....	Cincinnati...		3.10	4.00	3.85	3.60@ 4.00
Smokeless mine run.....	Cincinnati...		2.00	1.85	1.85	1.75@ 2.00
Smokeless screenings.....	Cincinnati...		1.50	.95	.95	1.10@ 1.25
*Smokeless mine run.....	Boston...		4.40	4.25	4.10	4.00@ 4.25
Clearfield mine run.....	Boston...		1.90	1.95	2.00	1.70@ 2.25
Cambria mine run.....	Boston...		2.35	2.30	2.30	2.10@ 2.50
Somerset mine run.....	Boston...		2.15	2.05	2.15	1.85@ 2.40
Pool 1 (Navy Standard).....	New York...		3.00	2.80	2.80	2.65@ 2.95
Pool 1 (Navy Standard).....	Philadelphia...		2.95	2.70	2.70	2.50@ 2.90
Pool 1 (Navy Standard).....	Baltimore...			2.30	2.30	2.10@ 2.50
Pool 9 (Super. Low Vol.).....	New York...		2.25	2.10	2.05	1.90@ 2.25
Pool 9 (Super. Low Vol.).....	Philadelphia...		2.35	2.15	2.15	1.95@ 2.35
Pool 9 (Super. Low Vol.).....	Baltimore...		2.25	1.70	1.70	1.65@ 1.80
Pool 10 (H.Gr.Low Vol.).....	New York...		2.00	1.80	1.80	1.65@ 2.05
Pool 10 (H.Gr.Low Vol.).....	Philadelphia...		1.85	1.75	1.75	1.65@ 1.90
Pool 10 (H.Gr.Low Vol.).....	Baltimore...		2.20	1.55	1.55	1.50@ 1.65
Pool 11 (Low Vol.).....	New York...		1.60	1.60	1.60	1.50@ 1.75
Pool 11 (Low Vol.).....	Philadelphia...		1.65	1.45	1.45	1.35@ 1.60
Pool 11 (Low Vol.).....	Baltimore...		1.90	1.45	1.45	1.40@ 1.50
High-Volatile, Eastern		Market Quoted	Dec. 17 1923	Dec. 1 1924	Dec. 8 1924	Dec. 15 1924†
Pool 54-64 (Gas and St.)..	New York...		1.60	1.50	1.50	1.40@ 1.65
Pool 54-64 (Gas and St.)..	Philadelphia...		1.65	1.50	1.50	1.40@ 1.60
Pool 54-64 (Gas and St.)..	Baltimore...		1.85	1.45	1.45	1.40@ 1.50
Pittsburgh sc'd gas.....	Pittsburgh...		2.55	2.40	2.40	2.30@ 2.50
Pittsburgh gas mine run.....	Pittsburgh...		2.25	2.10	2.10	2.00@ 2.25
Pittsburgh mine run (St.)..	Pittsburgh...		2.05	1.85	1.85	1.75@ 2.00
Pittsburgh slack (Gas).....	Pittsburgh...		1.50	1.20	1.20	1.15@ 1.25
Kanawha lump.....	Columbus...		2.85	2.30	2.30	2.10@ 2.50
Kanawha mine run.....	Columbus...		1.60	1.55	1.55	1.45@ 1.65
Kanawha screenings.....	Columbus...		.95	.90	.90	.80@ 1.00
W. Va. lump.....	Cincinnati...		2.85	2.85	2.60	1.90@ 2.50
W. Va. gas mine run.....	Cincinnati...		1.60	1.45	1.45	1.40@ 1.65
W. Va. steam mine run.....	Cincinnati...		1.60	1.45	1.45	1.30@ 1.50
W. Va. screenings.....	Cincinnati...		.80	1.00	1.00	.80@ 1.10
Hoeking lump.....	Columbus...		2.90	2.55	2.55	2.35@ 2.75
Hoeking mine run.....	Columbus...		1.85	1.60	1.60	1.50@ 1.75
Hoeking screenings.....	Columbus...		1.15	.80	.80	.75@ .90
Pitts. No. 8 lump.....	Cleveland...		2.45	2.40	2.45	2.00@ 2.85
Pitts. No. 8 mine run.....	Cleveland...		1.95	1.85	1.85	1.85@ 1.90
Pitts. No. 8 screenings.....	Cleveland...		1.60	1.20	1.20	1.25@ 1.50
Midwest		Market Quoted	Dec. 17 1923	Dec. 1 1924	Dec. 8 1924	Dec. 15 1924†
Franklin, Ill. lump.....	Chicago...		\$3.60	\$3.35	\$3.35	\$3.00@ \$3.50
Franklin, Ill. mine run.....	Chicago...		2.35	2.35	2.35	1.25@ 2.50
Franklin, Ill. screenings.....	Chicago...		1.80	1.45	1.50	1.50@ 1.75
Central, Ill. lump.....	Chicago...		3.00	2.85	2.85	2.75@ 3.00
Central, Ill. mine run.....	Chicago...		2.10	2.20	2.20	2.15@ 2.25
Central, Ill. screenings.....	Chicago...		1.50	1.30	1.35	1.60@ 1.75
Ind. 4th Vein lump.....	Chicago...		3.25	3.10	3.10	3.00@ 3.25
Ind. 4th Vein mine run.....	Chicago...		2.60	2.35	2.35	2.25@ 2.50
Ind. 4th Vein screenings.....	Chicago...		1.70	1.55	1.55	1.50@ 1.60
Ind. 5th Vein lump.....	Chicago...		2.50	2.75	2.75	2.50@ 3.00
Ind. 5th Vein mine run.....	Chicago...		2.10	2.10	2.10	2.00@ 2.25
Ind. 5th Vein screenings.....	Chicago...		1.50	1.20	1.30	1.25@ 1.35
Mt. Olive lump.....	St. Louis...		3.10	3.00	3.00	3.00
Mt. Olive mine run.....	St. Louis...		2.50	2.35	2.35	2.25@ 2.50
Mt. Olive screenings.....	St. Louis...		1.75	1.10	1.10	1.00@ 1.25
Standard lump.....	St. Louis...		2.85	2.75	2.75	2.75
Standard mine run.....	St. Louis...		1.95	1.95	1.95	1.90@ 2.00
Standard screenings.....	St. Louis...		1.35	1.05	1.05	1.00@ 1.15
West Ky. lump.....	Louisville...		3.00	2.85	2.60	2.85@ 3.50
West Ky. mine run.....	Louisville...		1.75	1.60	1.60	1.35@ 1.75
West Ky. screenings.....	Louisville...		1.15	.90	1.10	1.00@ 1.25
West Ky. lump.....	Chicago...		2.85	2.75	2.60	2.25@ 3.50
West Ky. mine run.....	Chicago...		1.75	1.55	1.55	1.40@ 1.70
South and Southwest		Market Quoted	Dec. 17 1923	Dec. 1 1924	Dec. 8 1924	Dec. 15 1924†
Big Seam lump.....	Birmingham...		3.85	3.10	3.10	2.50@ 3.25
Big Seam mine run.....	Birmingham...		1.95	1.70	1.70	1.60@ 1.75
Big Seam (washed).....	Birmingham...		2.35	1.85	1.85	1.75@ 2.00
S. E. Ky. lump.....	Chicago...		3.10	2.75	2.75	2.50@ 2.75
S. E. Ky. mine run.....	Chicago...		1.85	1.60	1.60	1.40@ 1.60
S. E. Ky. lump.....	Louisville...		3.10	3.00	2.85	2.50@ 2.75
S. E. Ky. mine run.....	Louisville...		1.75	1.60	1.60	1.35@ 1.50
S. E. Ky. screenings.....	Louisville...		1.15	.90	.95	.85@ 1.10
S. E. Ky. lump.....	Cincinnati...		2.85	2.75	2.85	2.00@ 2.75
S. E. Ky. mine run.....	Cincinnati...		1.55	1.50	1.55	1.25@ 1.75
S. E. Ky. screenings.....	Cincinnati...		1.00	1.00	.95	.75@ 1.10
Kansas lump.....	Kansas City...		4.75	4.75	4.75	4.50@ 5.00
Kansas mine run.....	Kansas City...		3.25	3.35	3.10	2.75@ 3.25
Kansas screenings.....	Kansas City...		2.00	2.30	2.30	2.25@ 2.35

\* Gross tons, f.o.b. vessel, Hampton Roads.

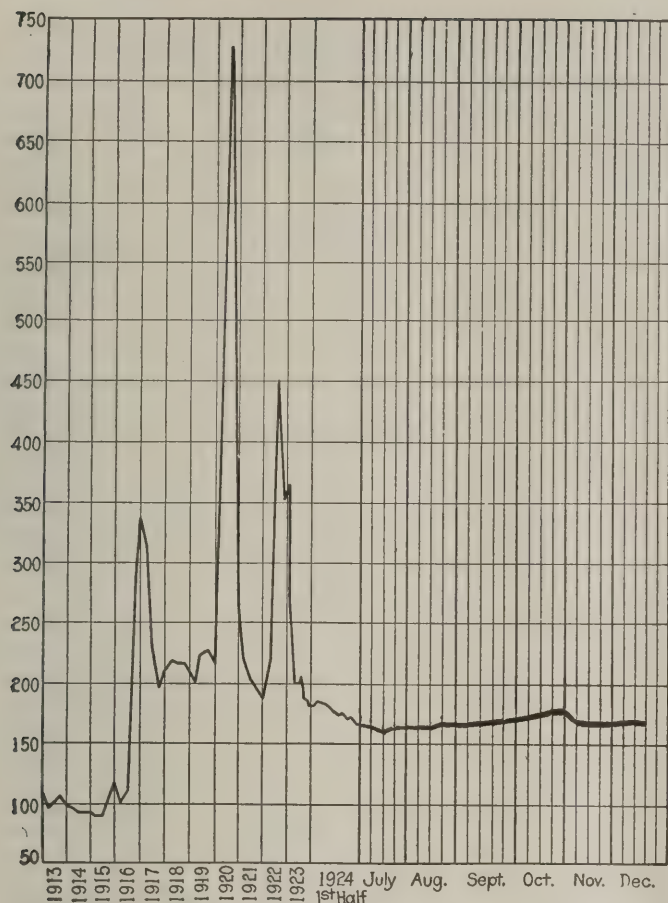
† Advances over previous week shown in heavy type, declines in italics.

### Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

		Market Quoted	Freight Rates	Dec. 17, 1923		Dec. 8, 1924		Dec. 15, 1924†	
				Independent	Company	Independent	Company	Independent	Company
Broken.....	New York...		\$2.34	\$8.50@ 10.00	\$8.00@ \$9.25		\$8.00@ \$9.25		\$8.00@ \$9.25
Broken.....	Philadelphia...		2.39				9.15		9.15
Egg.....	New York...		2.34	9.85@ 10.50	8.75@ 9.25	\$8.25@ \$8.75	8.75@ 9.25	\$8.25@ \$8.75	8.75@ 9.25
Egg.....	Philadelphia...		2.39	9.85@ 12.20	8.75@ 9.25	9.45@ 9.75	8.80@ 9.25	9.45@ 9.75	8.80@ 9.25
Egg.....	Chicago*		5.06	9.60@ 12.50	8.00@ 8.35	8.17@ 8.25	8.15@ 8.20	8.17@ 8.40	8.08
Stove.....	New York...		2.34	9.85@ 12.50	8.75@ 9.25	10.00@ 10.50	9.00@ 9.50	10.00@ 10.50	9.00@ 9.50
Stove.....	Philadelphia...		2.39	9.85@ 12.20	8.90@ 9.25	10.10@ 10.75	9.15@ 9.50	10.10@ 10.75	9.15@ 9.50
Stove.....	Chicago*		5.06	9.60@ 12.50	8.00@ 8.35	8.63@ 8.75	8.50@ 8.64	8.80@ 9.00	8.53@ 8.65
Chestnut.....	New York...		2.34	9.85@ 11.00	8.75@ 9.25	10.00@ 10.50	8.75@ 9.40	10.00@ 10.50	8.75@ 9.40
Chestnut.....	Philadelphia...		2.39	9.85@ 12.20	8.90@ 9.25	10.00@ 10.75	9.25@ 9.40	10.00@ 10.75	9.25@ 9.40
Chestnut.....	Chicago*		5.06	9.60@ 12.50	8.00@ 8.35	8.26@ 8.40	8.44@ 8.60	8.61@ 9.00	8.40@ 8.41
Pea.....	New York...		2.22	6.00@ 7.25	6.15@ 6.65	4.75@ 5.50	5.50@ 6.00	4.75@ 5.50	5.50@ 6.00
Pea.....	Philadelphia...		2.14	6.35@ 7.50	6.35@ 6.60	5.75@ 6.00	6.00	5.75@ 6.00	6.00
Pea.....	Chicago*		4.79	6.00@ 6.75	5.40@ 6.05	5.13@ 5.45	5.36@ 6.20	5.36@ 5.75	5.36@ 5.95
Buckwheat No. 1.....	New York...		2.22	2.00@ 3.00	3.50	2.25@ 2.75	3.00@ 3.15	2.00@ 2.50	3.00@ 3.15
Buckwheat No. 1.....	Philadelphia...		2.14	2.25@ 3.50	3.50	2.50@ 3.00	3.00	2.50@ 3.00	3.00
Rice.....	New York...		2.22	1.35@ 2.25	2.50	1.75@ 2.00	2.00@ 2.25	1.75@ 2.00	2.00@ 2.25
Rice.....	Philadelphia...		2.14	1.75@ 2.50	2.50	2.00@ 2.25	2.25	2.00@ 2.25	2.25
Barley.....	New York...		2.22	1.25@ 1.50	1.50	1.25@ 1.50	1.50	1.25@ 1.50	1.50
Barley.....	Philadelphia...		2.14	1.00@ 1.50	1.50	1.50	1.50	1.50	1.50
Birdseye.....	New York...		2.22	1.25@ 1.45	1.60	1.40@ 1.60	1.60	1.40@ 1.60	1.60

\* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics.





Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

Index	1924			1923
	Dec. 15	Dec. 8	Dec. 1	Dec. 17
Weighted average price	169	171	171	181
	\$2.04	\$2.07	\$2.07	\$2.19

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board.

are moving for steam use are holding fairly well, but block, egg and lump are all weaker. Considerable distress coal is in various markets and a lot of "no bill" coal is on track in the coal fields, and some operators who have overproduced are on the verge of shutting down. Others are offering ridiculously low figures in an effort to force movement.

There is much undercutting of circulars. For instance, it is reported that some of the large producers in western Kentucky were so overloaded with unsold coal within the past few days that in some instances 6-in. block was shipped on high grade mine run orders at \$1.75 a ton, and mine run in some instances was shipped on nut and slack orders. The block market while quoted at \$2.25@2.50 is weak as a result of block being offered as low as \$2@2.25. Lump is offered at the latter figure, but egg has been in better demand and is quoted at \$2.10@2.35, with nut at \$1.50@1.85 and mine run, \$1.35@1.75. Screenings are \$1@1.25.

In eastern Kentucky a few specialty coals are quoted at \$3@3.25 and perhaps higher, but the block market is \$2.50@2.75 on good grades, with lump \$2.25@2.50; egg, \$1.75@2.15; nut, \$1.60@1.90; mine run, \$1.35@1.60 and screenings, 85c@1.10.

### Northwest Trade Is Fair

Navigation, as far as coal is concerned, closed officially Dec. 10 at the Head-of-the-Lakes. In all, 30 cargoes arrived during the last week, of which one was hard coal. In the receipts were several cargoes of Pocahontas, which puts this coal again on the Duluth market. Official figures of receipts during November show that 1,186,790 tons of soft and 67,434 tons of hard were received. This brings the

receipts for the season up until Nov. 30 to 1,264,705 tons of hard coal and 7,541,453 tons of soft coal.

Stocks on docks at present are estimated at 7,500,000 tons of soft coal and about 800,000 tons of hard coal. The normal consumption between now and the opening of navigation usually is about 5,000,000 tons of soft coal. Figuring this way, there will be plenty of soft on the docks at the opening of navigation. The anthracite outlook is far from bright, as consumers are burning anything but hard coal. Shipments from the docks last month were the heaviest in two years. In all 28,755 cars went out as against 26,415 in October, and 27,696 in July, 1922, which was the largest previous month. Docks are working overtime and some of them on Sunday.

Movement of coal from the docks in Milwaukee is only fair. The weather has spurred consumers a little, but there will be no rush for fuel until real winter cold waves send the temperature down to zero and below. Four cargoes of coal are now upward bound for Milwaukee. Their arrival will mark the close of the season for cargo coal. The receipts for December up to and including the 10th were 28,900 tons of anthracite and 85,668 tons of bituminous coal—a total of 114,568 tons. The receipts for the season up to the 10th were 805,862 tons of anthracite and 2,587,023 tons of bituminous coal—3,392,885 tons in all. The receipts of cargo coal in 1923, up to Dec. 11, when the season closed, totaled 966,224 tons of anthracite and 3,238,722 tons of bituminous coal—4,204,946 tons in all.

### Western Trade Improves

A little cold weather through Kansas and Oklahoma in the last week has reduced the surplus of domestic grades at the mines and has slightly improved operating time in the Southwest. But several weeks of cold will be necessary to bring production up to normal for this time of year. The improvement is not yet sufficient to eliminate shading.

In Colorado the cold weather which has prevailed for the past several days has naturally stimulated the market, particularly for lignite. There has been a slight improvement in the market for Colorado coals in Nebraska, Kansas and South Dakota. This has resulted in increased production and the mines are now operating at about 70 per cent.

The prevailing prices on the lignite coals in northern Colorado are \$3 for Weld County and \$4.25 for Boulder County. Southern Colorado bituminous is \$5.25 for lump, \$4.25 for nut and \$3.50 for pea (washed). Prices in the Dawson-Raton district, New Mexico, are: Domestic lump, \$4.50; nut, \$4; egg, \$4.50; pea, \$3.50. Coke prices for Dawson, New Mexico, are \$6, \$7.50 and \$8.75; for Colorado (Minnequa Segunda), \$6@7.50.

In spite of the heavy snowstorms in Utah working time at the mines has not increased appreciably, being still around 60 per cent of capacity. Stocks are much below normal. Dealers report a brisk demand for pea coal and slack for heating. All other sizes are in only fair demand. Railroads are taking very little coal now. Most of them are picking up their stocks. The metal industry continues to be the best industrial customer for coal.

### Spirits Flag in Ohio Markets

Fairish winter weather has failed to revive the flagging spirits of the Cincinnati market. "Free coal" is becoming increasingly hard to move and a clutter of "no bill" cars at the yards of originating railways has added to the gloom. Retailers are inclined to hold off from purchases rather than carry such stocks in their inventories at the close of the year. Prices on bituminous have a broad range, one large West Virginia company with mines in Logan County having cut under \$2, though specialized coals from Coal River, Elkhorn and Perry County are being sold as high as \$4 a ton for domestic block and 4-in. lump. Egg is a drug on the market, but mine run shows slight price variation. Nut and slack and smaller sizes of resultant also hold up well. The smokeless market is suffering from inertia following the closing of the lakes. River business is booming with the stage holding at a good depth.

Trade at Columbus continues spotty. Domestic business is still slow due to continued unfavorable weather in many localities. Retail stocks are generally heavy and dealers are slow in placing orders. Many are making extremely low quotations to reduce stocks. The so-called fancy grades are in best demand, although the edge is off the Pocahontas market. Steam business is dull and featureless. Considerable demurrage coal, particularly in Toledo and Detroit,



has affected the Columbus market. Reserves are good and in some cases consumers are using these in preference to buying on the market. Overproduction of steam grades appears to be the main factor.

At Cleveland there is a scarcity of slack and nut-and-slack, which have stiffened 5c. to 15c. per ton during the week. Apparently many steam consumers failed to lay in reserves in these grades when the supply was plentiful, consequently, with the production of lump considerably off and the demand for slack stronger at this season of the year than is ordinarily the case, it is freely predicted that spot prices on these grades will continue to advance. Inquiries from steam consumers, other than for these grades, continue to be negligible because of hand-to-mouth buying.

### Nominal Gain in Pittsburgh Market

The Pittsburgh market shows a slight gain in tonnage turnover and slightly increased irregularity in prices, but broadly speaking there is no substantial change. Small lot inquiries in the spot market are more numerous but prices are not quotably changed except that steam slack now brings \$1.10@1.20 against a flat price of \$1.10 formerly quoted. The steel industry is running at a considerably better rate, but that does not seem to help steam coal.

The situation at Buffalo is not improving much, except that the feeling is better. Scarcity of slack has brought up the price about 20c., but that is merely because so little lump is selling that slack is scarce. There is some improvement in business generally and it looks as if by the first of the year the demand for soft coal would be considerably better. Non-union mines are practically furnishing the coal. The lake trade is at an end, with shipments of 2,616,550 tons, as against 2,907,320 tons the previous season.

### Only Casual Demand in New England

The New England market shows little change. Steam coals are in ample supply and there is only casual demand for relatively small tonnages. Inquiry for spot shipment in cargo lots is light, and about the only opening for tidewater coal is for distribution inland from ports like Boston, Providence and Portland. The industrial situation does not improve, although there are textile and shoe manufacturers who look for better business early in 1925. Generally, the steam grade is dragging on the bottom with prices in most quarters at the lowest point of the year.

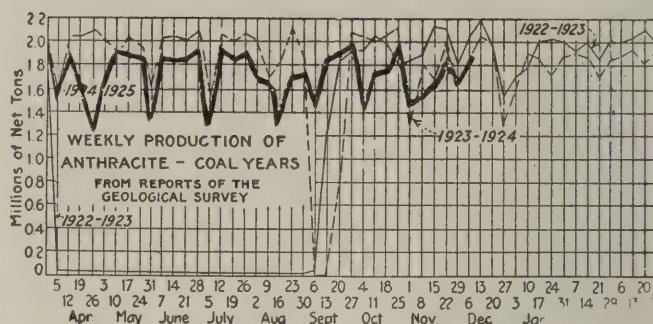
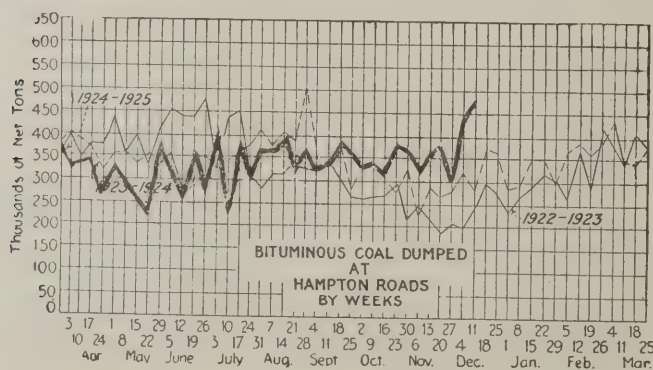
At Hampton Roads there continue to be fresh accumulations that the agencies are canvassing this territory to sell. The range is \$4@4.25 per gross ton f.o.b. vessel for smokeless coals, the actual price depending upon mine origin and the reputation of the coal.

All-rail from central Pennsylvania there is nothing more than the current moderate request that has been characteristic for several months and prices are on the same minimum basis. Most of the tonnage coming forward by water from New York and Philadelphia piers is restricted to specialties, including coal for gas producing, the quantity of ordinary steam coal moving in these channels being very small.

Prices on cars Boston at the rehandling wharves are wavering from \$4.25@4.35 per gross ton. Those factors who lack unloading facilities of their own are hard put to it to dispose of current arrivals and at the same time keep coal coming forward.

### Lull in Atlantic Seaboard Markets

Buyers are taking but little interest in the coal market at New York, though a few days of seasonable temperatures last week did create a little better demand for spot coal.



There have been no changes in quotations. Operators and shippers continue to evince optimism that business and prices will be better after Jan. 1. More contracts are expected to be closed than were closed this year. Demand for tidewater coal is dull, but the tonnage coming forward is moving with little pressure.

Wheels of industry at Philadelphia are going at a pretty fair speed, and while the average coal buyer is inclined to lessen purchases with the approaching end of the year, there is much new business being placed. The best demand is for the higher grades of Pennsylvania low volatiles. Gas slack is in limited supply.

At Baltimore the demand for soft coal has continued about on the average of the past three or four months. Industrial buyers are taking in small quantities as needed. The export situation continues dull, although the first 12 days of December showed a marked improvement over the corresponding period of November.

Domestic trade is practically flat at Birmingham, awaiting weather favorable to renewed business in the wholesale line. There is no material change in the steam market over a week ago. Fairly heavy rains last week probably will enable hydro-electric power plants to curtail operation of steam standbys, which have been heavy consumers of coal during the long drought. Railroads and other contract consumers are taking a little more coal, but are said to be already fairly well stocked against holiday interruption. Buying of commercial fuel is still restricted largely to immediate needs.

### Anthracite Trade Unsteady

Unsteadiness characterized the anthracite market at New York last week. Orders were less plentiful and it was the belief in some offices that but for the outlaw strikes in the coal fields the lessened demand might have reduced independent prices. Stove coal continues to move steadily and the demand is so strong that several operators are breaking down egg in order to meet the demand for the smaller size. Chestnut is gaining strength and in several instances is quoted at the same price as stove size. Pea is troublesome to move and is being sent to storage by some operators. Buckwheat No. 1 is slow but rice and barley are fairly active.

Philadelphia consumers are buying cautiously, as 90 per cent of all orders received are for single tons. Yards are well stocked except for nut, for which there is a steady call. There have been no further price increases. Egg and pea are causing trouble and steam sizes are rather slow.

Hard coal men at Baltimore report only a moderate demand, mainly due to the remarkably open weather. Many consumers who ordinarily begin to run out of coal about this time are still running along on the light supplies already laid in. The exhibit of devices arranged to burn buckwheat coal is to open in a few days.

Trade at Buffalo is as dependent on the weather as it is with winter going out and the prospect is that the trade will be in a slow-go-easy way all winter. There is talk of more advancing of price, supposed to be on account of the cost of the many strikes that have beset certain districts, but the consumer pays little attention to it.

### Car Loadings, Surpluses and Shortages

	Cars Loaded	
	All Cars	Coal Cars
Week ended Nov. 29, 1924.....	878,631	172,033
Previous week.....	1,010,122	195,553
Week ended Dec. 1, 1923.....	835,081	156,613
	Surplus Cars	
	All Cars	Coal Cars
Nov. 30, 1924.....	183,914	82,819
Nov. 22, 1924.....	156,101	84,367
Nov. 30, 1923.....	153,057	80,756
Car Shortage		
Nov. 30, 1924.....	1,336	605



## Foreign Market And Export News

### British Market Develops Strength; Idle Pits Resume

Renewed strength has appeared in the South Wales coal market, steady improvement and material reduction of stocks being in evidence. Several pits are resuming operations after three months of idleness.

Interest is chiefly centered in business for the early part of next year. Most collieries are well booked over December, but January bookings are only moderate. There is a fair demand for large steams, and small steams have improved.

Coal depot exporters have booked 250,000 tons of second Admiralty large over 1925 at 25s. to 25s. 6d. f.o.b., and the Admiralty has placed contracts aggregating 350,000 tons of second and best large steams at from 26s. to 27s. The Egyptian State railways have contracted for 200,000 metrical tons of Monmouthshire large steams for de-

livery beginning January to May, at 34s. 8d. to 34s. 11d. c.i.f. Alexandria has placed a contract for an equivalent amount at 24s. to 24s. 3d. f.o.b.

The general tone of the Newcastle market has improved, general inquiry being quite satisfactory, especially for gas and steam coals. Best steams are now being sold ahead for delivery next year for 19s. f.o.b. Around 70,000 tons of Durham gas coals have been sold to Italy and Sweden. Bunker coals are going better though they still glut the market. There is still considerable unemployment and short time.

Production by British collieries in the week ended Nov. 29, a cable to *Coal Age* states, was 5,303,000 tons, according to official reports. This compares with 5,309,000 tons produced in the preceding week.

### Foreign Trade Lightens Dullness At Hampton Roads

Business at Hampton Roads is dull, with demand for coastwise light and bunker trade only fair. A slight increase noted in foreign buying has proved a temporary stimulant.

Many mines have reported that they are preparing to shut down for the holidays, and the trade at Hampton Roads expects little improvement in business until the new year. Domestic retail business is suffering from unusually warm weather.

### Sluggish Tendency Prevails in French Coal Market

Inquiry for industrial fuels in the French coal market is slightly heavier while the house coal situation remains quiet. The mines, however, are shipping regularly on existing contracts. Because of lessened demand French importers are refusing any additional tonnage from Belgium for the moment.

On the other hand, arrivals from Great Britain are normal.

With regard to German commercial coals, the high prices asked by the Coal Syndicate have curtailed French buying. There are 5,000,000 tons of coal now lying in the Ruhr, and they will move only if the Germans quote reasonable prices. In order to find new outlets, they are now facilitating payments by allowing credit of three to six months.

The wage convention now in force in the Nord and Pas-de-Calais mine will end Dec. 31, and the labor unions have appointed a subcommittee to take up the task of obtaining higher pay for the mine workers.

From Nov. 16 to 22, France and Luxemburg received 117,800 tons of indemnity fuel, of which 36,600 tons was coal, 74,700 tons coke and 6,500 tons lignite briquets. Deliveries of Ruhr coke in November amounted to 174,138 tons, an average of 5,800 tons a day, compared with 8,500 to 9,000 tons previously. Receipts for the first three

days of the current month were 39,046 tons, a daily average of 13,000 tons. The price of indemnity coke is unaltered and presumably will remain so for some time.

### Export Clearances, Week Ended Dec. 13, 1924

FROM HAMPTON ROADS		
For Argentina:		Tons
Ital. Str. Adige, for Buenos Aires.....	9,275	
For Brazil:		
Br. Str. Avonmede, for Rio de Janeiro.....	6,057	
Fr. Str. Germaine L. D., for Rio de Janeiro...	6,119	
Br. Str. General Smuts, for Rio de Janeiro...	5,549	
For Canada:		
Nor. Str. Sisto, for Halifax.....	1,471	
Amer. Str. Melville Dollar, for Vancouver....	507	
For Cuba:		
Nor. Str. Thorsal, for Havana.....	3,310	
Br. Str. Berwindmoor, for Havana.....	9,654	
For Italy:		
Ital. Str. Valsesia, for Porto Ferrajo.....	7,768	
Ital. Str. M. T. Cicerone, for Porto Ferrajo...	9,226	
For Porto Rico:		
Amer. Str. Lillian, for San Juan.....	4,877	
For Peru:		
Peru. Str. Amazonas, for Callao.....	2,681	
For West Indies:		
Br. Schr. Cutty Sark, for Kingston.....	580	
Nor. Str. Fram, for Port of Spain.....	4,012	
For—		
Dan. Str. Jan., for Puerto Tarafa (?).....	2,641	

### FROM PHILADELPHIA

For Cuba:	
Nor. Str. Sagaland, for Havana.....	—
Ger. Str. Rhon, for Havana.....	—
Br. Str. Stromra, for Havana.....	—
For Nova Scotia:	
Br. Schr. Jean F. Anderson, for Halifax .....	—

### FROM BALTIMORE

For Egypt:	
Br. Str., Koranton, Alexandria.....	8,091
For Italy:	
Ital. str., Aster, Civita Vecchia.....	8,877

### Hampton Roads Pier Situation

N. & W. Piers, Lamberts Pt.:	Dec. 4	Dec. 11
Cars on hand.....	1,742	1,504
Tons on hand.....	108,290	98,697
Tons dumped for week.....	147,162	181,958
Tonnage waiting.....	50,000	10,000
Virginian Piers, Sewalls Pt.:		
Cars on hand.....	1,970	1,910
Tons on hand.....	125,150	130,550
Tons dumped for week.....	114,211	115,270
Tonnage waiting.....	2,200	6,474
C. & O. Piers, Newport News:		
Cars on hand.....	1,848	2,053
Tons on hand.....	84,125	92,893
Tons dumped for week.....	125,889	130,539
Tonnage waiting.....	15,715	4,505

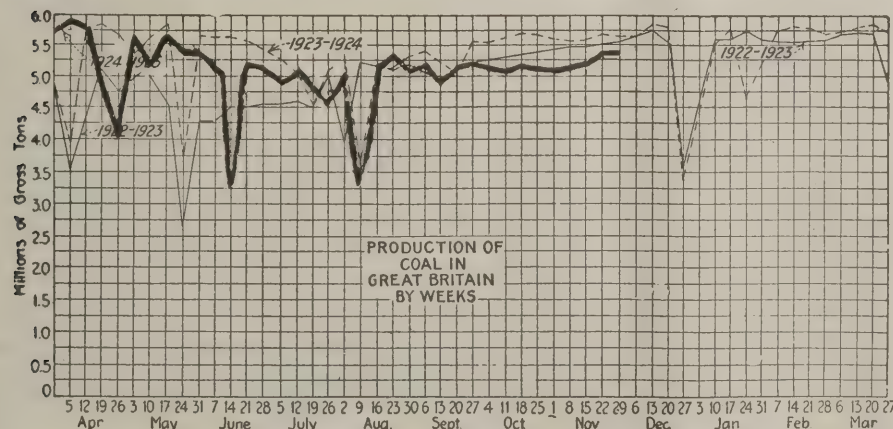
### Pier and Bunker Prices, Gross Tons

PIERS		Dec. 6	Dec. 13†
Pool 9, New York....	\$4.75@ \$4.90	\$4.75@ \$4.90	
Pool 10, New York....	4.40@ 4.65	4.40@ 4.65	
Pool 11, New York....	4.20@ 4.45	4.20@ 4.45	
Pool 9, Philadelphia..	4.90@ 5.25	4.90@ 5.25	
Pool 10, Philadelphia..	4.45@ 4.70	4.45@ 4.70	
Pool 11, Philadelphia..	4.30@ 4.50	4.30@ 4.50	
Pool 1, Hamp. Roads.	4.15	4.15	
Pool 2, Hamp. Roads.	4.00	4.10	
Pools 5-6-7 Hamp. Rds.	4.00	4.00	
BUNKERS			
Pool 9, New York....	\$5.00@ \$5.15	\$5.00@ \$5.15	
Pool 10, New York....	4.65@ 4.90	4.65@ 4.90	
Pool 11, New York....	4.50@ 4.70	4.50@ 4.70	
Pool 9, Philadelphia..	4.90@ 5.25	4.90@ 5.25	
Pool 10, Philadelphia..	4.75@ 4.95	4.75@ 4.95	
Pool 11, Philadelphia..	4.50@ 4.70	4.50@ 4.70	
Pool 1, Hamp. Roads.	4.25	4.25	
Pool 2, Hamp. Roads.	4.10	4.15	
Pools 5-6-7 Hamp. Rds.	4.10	4.10	

### Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations by Cable to <i>Coal Age</i>		Dec. 6	Dec. 13†
Cardiff			
Admiralty, large	27s. @ 27s. 6d.	27s. 6d.	
Steam smalls....	16s.	20s.	
Newcastle:			
Best steams.....	18s. 9d. @ 19s.	18s. 6d. @ 18s. 9d.	
Best gas.....	21s. 6d. @ 22s. 6d.	22s. @ 22s. 6d.	
Best Bunkers....	17s. 6d. @ 19s.	17s. 6d. @ 19s.	

†Advances over previous week shown in heavy type; declines in italics.







## News Items From Field and Trade



### ALABAMA

The Franklin Coal Mining Co. is constructing a 400-ton Montgomery coal washery at its Powhatan No. 2 mine, in the western end of Jefferson County, which will give the company a capacity of 750 tons of washed coal per day from its two openings.

Among increases in capital stock of corporations reported by the Secretary of State is the Union Coal Co., Walker County, \$1,100,000. This increase in capital is in connection with the recent acquisition of about 15,000 acres of coal lands from the Sloss-Sheffield Steel & Iron Co., by A. B. Aldridge, of Birmingham, and associates. An increase of \$100,000 also is reported in the capital stock of the Goodwin Coal Co., Inc. of Dora, Walker County.

### ILLINOIS

Harry Tanner and Charles Law, of Pana, sold the Litchfield coal mine at Litchfield to John Puckett, of that city, for a reported price of \$60,000. Temple McDonald, of Hillsboro, has been named manager and will reopen the mine at once.

David Hagman and Grover Davis have formed a partnership to operate a new coal mine at Matherville.

Two mines in Springfield have been opened within the last few days. Empire Mine No. 1, owned by the Illinois Coal Co., has been opened with a large force. This is the old Jones and Adams mine east of the fair grounds. The Spring Creek Coal Co.'s mine west of the city on the Baltimore & Ohio Southwestern R.R. also has been opened with four hundred men working. A miners' train is being operated by the B. & O. S. W., from Second and Madison Streets, Springfield, to the mine. More than one-half of the thirty mines in the Springfield district will be in operation with the opening of these two mines. At one time during the summer only one-third of the mines were in operation.

G. W. Bower and son of Monett, Mo., with a company of men, are prospecting for coal near Pinckneyville. They are drilling south of that town where they have found coal within 18 ft. of the surface. They have forty tracts of forty acres each leased.

Mine No. 5 of the Spring Valley Coal Co., at Dalzell, has been permanently closed and sealed. The work of dismantling the mine will be begun at once. This mine was sunk in 1899 and was for several years considered one of the best of the Spring Valley Coal

Co.'s mines. The mine was closed Feb. 15, 1922, and since that time has been idle. The company also is closing its store at Spring Valley.

The Gano Moore Coal Mining Co., of Philadelphia, Pa., is about to purchase the properties of the defunct Southern Gem Coal Corporation of Illinois for \$2,000,000. The Philadelphia concern is said to have made the offer, and its acceptance depends upon the sanction of the federal district court in East St. Louis. A bond issue of \$1,175,000 and a miners' payroll of \$225,000 due more than a year ago are outstanding. There are various other claims against the properties totaling about double the \$600,000 which would remain of the purchase price of \$2,000,000.

### IOWA

The McCagg mine, east of Knoxville, has been closed, the last ton of coal being billed out to the Rock Island R.R., which has been one of the largest customers of the mine. The McCagg mine was one of the largest mines in Marion County, having employed as many as 150 men, who made their homes in Knoxville and Flagler.

### KENTUCKY

The U. S. Circuit Court of Appeals at Cincinnati held that the U. S. District Court at Jackson erred in refusing the Fordson Coal Co. a restraining order against W. J. Maggard, sheriff of Leslie County, and ordered the lower court to issue a preliminary injunction. The coal company had sought and been refused a restraining order against the sheriff from collecting more than \$11,797 taxes on its tract of 80,951 acres of land in Leslie County.

The Bulan Coal Co., Bulan, will soon begin erection of ten miners' cottages.

It is reported that a big coal merger is pending at Lexington for merging coal companies and coal properties in the Carrs Fork section of Eastern Kentucky. Companies mentioned as being interested in the deal are the Scuddy Coal Co., Montgomery Coal Co. and the Happy Coal Co. although President C. L. Ryley of the latter company denies it. It is claimed that if the deal is made a paper manufacturing concern of Providence, R. I., will take the bulk of the mine output.

Reports from the Whitesburg and Hazard districts of eastern Kentucky are to the effect that there has been a good deal of coal land leasing underway

and some new railroad construction is planned, one contract having recently been let. Much of the new development appears to be planned in the Carrs Fork Section above Vicco, on the Knott County border, according to reports. The fact that the Louisville & Nashville R.R. is to connect through that section with the Carolina, Clinchfield & Ohio, giving outlet to the South Atlantic, will materially improve traffic facilities in the district and enable operators to move coal more freely in times of good demand.

John W. Menzies, U. S. Court clerk at Covington, has gone to Prestonburg, in compliance with orders of federal court, as a special commissioner to sell the property, merchandise and equipment of the Liberty Coal Corporation in Floyd County. The sale follows the litigation in the case of T. H. Morris, trustee, against the Liberty Coal Corporation, which was filed in the federal court at Covington in November, 1922. The order of sale directs that the property shall not be sold for less than \$52,500. The land is divided into four tracts, all of which are located on the left fork of Beaver Creek in Floyd County.

### MINNESOTA

The Berwind Fuel Co. has started working on a third addition to its briquet plant at Superior, Wis. The addition will be ready in the spring. The necessity for increased capacity bears testimony to the popularity which this form of fuel has gained at the Head-of-the-Lakes.

W. H. Godwin, vice-president of the Carnegie Coal & Dock Co., was at Duluth-Superior harbor last week, inspecting docks. He spoke most optimistically of the future, and said that he did not anticipate any great surplus of stocks in the spring.

### NEW YORK

The Emergency Coal Board appointed by Governor Alfred E. Smith last year issued a report last week in which it assured consumers of coal that the coal situation is encouraging and that the supply is plentiful. "Information in our possession," said the board, "leads us to believe that there will be an ample supply during the coming winter. Should any emergency arise the committee stands ready to take command." The board members are General Charles W. Berry, George Eltz and Health Commissioner Monaghan.



## OHIO

With no opposition all officers of the Ohio district of the United Mine Workers have been elected for the coming year. They are Lee Hall, president; G. W. Savage, secretary, and William Roy, vice-president.

John H. Eagleson, a Columbus attorney, has been named receiver for the Starr-Jackson Mining Co. upon the application of Adam Penman, who claimed a debt against the company. The concern has been operating a small mine near Logan, in the Jackson field. Offices in Columbus had been discontinued for some time.

While the date has not been definitely fixed, the court has decided that the assets of the Maynard Coal Co., of Columbus, which has been in the hands of receivers for about a year, will be sold at auction about Jan. 5 next. Receivers Williams S. Harman and Frank L. Stein have been instructed to advertise the properties when the date is definitely fixed. The assets consist of working mines in the Pomeroy field in Ohio and in the Hazard field in Kentucky.

Operations have been resumed again at the Webb mine of the Cambria Collieries Co., south of Bellaire, employing about 600 men. It had been idle since about the middle of July owing to a disagreement between the miners and the company. At a recent meeting of the members of Local Union No. 1840 terms of the company were agreed to and men were immediately ordered out to work. During the time the mine was in idleness a good deal of machinery and equipment was added.

## PENNSYLVANIA

Unofficial returns from the biennial election of District No. 5, United Mine Workers (Pittsburgh) indicate the re-election of President P. T. Fagan, Vice-President W. J. Patton, Secretary-Treasurer William Hargest and all other officials seeking re-election.

Charles O'Neill, secretary of the Central Pennsylvania Coal Producers' Association, in a letter to the operators throughout the district, announces that no further action has been taken looking to an adjustment of the wage scale. Mr. O'Neill points out that with the resumption of work at a number of important operations where there are large unions which have repudiated the scale and allowed the men to return to work on the 1917 basis the situation will gradually adjust itself. He says the pressure of the movement among the miners who are without employ-

ment or money to support their families will bring about the solution of the problems facing the operators.

John Brophy, president of District No. 2, United Mine Workers (central Pennsylvania), with headquarters in Clearfield, was re-elected to that office at an election conducted throughout the district on Dec. 9. He had no opposition. The name of George Bassett, who had been nominated, did not appear on the official ticket. Richard Gilbert, secretary-treasurer, who has held that post for a quarter of a century, was re-elected without opposition. James Mark, the present vice-president, also was re-elected, he being the only one of the three with opposition.

Thirty employees of the Ebensburg Coal Co. at Colver, Cambria County, have organized to take the course in mining offered by Pennsylvania State College. W. G. Duncan, of the college mining department, organized the class, and the instructor in mining will be F. M. Maloy, while Thomas Brown will be the instructor in electrical work. The students will be awarded mine foreman certificates if they successfully complete the course.

The Shipman Coal Co., of Shamokin, has just closed a deal for the lease of a virgin tract at Maysville Park. The same firm is said to be dickering with the Lehigh Valley company for a lease on a tract close to the former's present operations, a royalty proposition having been suggested.

Local No. 4716, United Mine Workers, at Lilly, Cambria County, at a recent meeting adopted a resolution indorsing the action of the district officers in refusing to acquiesce in solicitations of the operators for a reduction in wages. The resolution sets forth that the local union believes that a reduction of wages is not the remedy for slack work.

James West, Sr., has just purchased 45 acres of coal in Luzerne township from the Superior Connellsville Coal & Coke Co. for \$77,514. All mining rights go with the sale of the land. The coal is said to be Pittsburgh 9 ft. coal. George Whyel is president of the Superior and transacted the deal with West.

Isaac Taylor, of Uniontown, is in the Presbyterian Hospital at Pittsburgh recovering from the amputation of his left leg above the knee on Friday, Dec. 5, on account of hardening of the arteries. He withstood the operation very well, especially considering his advanced age.

According to a report from Shamokin a deal is under way which will give the Madeira-Hill Coal Co. a lease on a

valuable portion of a tract owned by the Lehigh Valley Coal Co. between Johnson City and Kulptown. This tract is said to possess some of the richest seams in the anthracite region.

As a result of the decision of the U. S. Supreme Court upholding the constitutionality of the Pennsylvania anthracite tax, the state treasury will receive approximately \$6,000,000, held up by the litigation. In his biennial estimate of the expected revenues for the coming two-year appropriation period, Auditor General Samuel S. Lewis has figured \$12,000,000 as the revenue from the coal tax, or \$6,000,000 a year. The sum which will now be received has been included in his estimate which will guide the Legislature in making its appropriations during the coming winter.

The State Workmen's Insurance Board has authorized a dividend of 15 per cent in addition to the 10 per cent differential allowed in compensation insurance written with the state fund. The state fund has issued 8,500 new policies during the present year. The total reserve of the fund set aside to pay claims to injured workmen and to dependents of deceased employees of policyholders in the fund is \$3,140,661. This amount, the board announced, is exclusive of claim payments already made. During the past seven years the fund has accumulated a surplus amounting to \$2,362,609.

## UTAH

D. D. Muir, Jr., general manager of the United States Smelting, Refining & Mining Co., has been made vice-president and general manager of the United States Fuel Co., a subsidiary of the first-named corporation. This promotion comes to Mr. Muir but a comparatively short time after he was named second vice-president of the United States Smelting, Refining & Mining Co.

The National Coal Co., headed by F. A. Sweet, C. N. Strevell, C. T. Worley, George A. Storrs and George S. Payne, all of Salt Lake City, has petitioned the Public Utilities Commission for authority to construct 13 miles of railroad to connect the coal properties in the Gordon Creek Canyon district with the Utah Railway two miles south of Helper. The company proposes to build 10.627 miles of main line beginning at station 753 on the Utah Railway and extending in a northwesterly direction. At Coal Creek, according to the plans submitted to the commission, one branch would extend 1.375 miles into the Coal Creek district, while the main line would continue for a few miles, where a branch 0.527 mile long would extend in a northwesterly direction to open up the Right Ford properties. Another branch would extend 0.546 mile into the Bryner Canyon district. Applications covering the necessary rights of way have already been filed with the U. S. Land Office. It is set forth that thousands of acres of new coal lands would be opened by the branch line. The proposed line is to be a coal road exclusively. If permission to construct the line is granted the work will be commenced at once, it is stated.



### Anthracite Economy Service Traveling Show

To teach people how to cut down their coal bills the Anthracite operators are sending this unique traveling information bureau and exhibit throughout the country this winter.



## VIRGINIA

The Island Creek Coal Co., of West Virginia, is preparing to open a branch office in Norfolk within a short time. No announcement has been made as to who will take charge.

The Fort Dearborn Coal Co., has changed its name to the Fort Dearborn Fuel Co., Inc., authorization having been given by the State Corporation Commission this week for the change. C. Henry Harman is president of the company and W. G. Brinson is in charge of the Norfolk branch.

## WEST VIRGINIA

Permission has been granted to the Preston Smokeless Coal Co. to increase its capital stock from \$75,000 to \$100,000.

Plans have been matured by the Gauley Mountain Coal Co. to develop a tract of 4,000 acres of coal land on Maple Meadow Fork of Coal River, in Raleigh County, which in recent tests by diamond drill showed the existence of the Beckley seam of smokeless coal. The Hewitt and other New York interests own the Gauley Mountain Coal Co., of which R. H. Morris, of Ansted, is the resident manager.

Five coal tracts in the Liberty district of Ohio County were purchased early in December by S. A. Williams from Lee Grossman and others for \$42,500. Coal and farm property on the Middle Wheeling Creek road at the same time was acquired by three Elm Grove men for \$36,000, the coal purchased being in the Pittsburgh vein.

The Coalfield Fuel Co. and the West Virginia Eagle Coal Co. announce the removal of their offices from the Virginian Land Bank Building, Charleston, to their mines at Boncar, Fayette County.

Deputy sheriffs and state police have arrested 16 men charged with conspiracy to blow up the tippie of the New England Fuel & Transportation Co. at Grant Town. Some of the men have been released under bond of \$1,000 for the next term of the grand jury. The arrests were made by Sheriff John D. Charlton of Marion County upon information received from passengers on a street car running between Fairmont and Fairview who say they heard 16 men discussing the alleged plot to dynamite the tippie.

Fire at the plant of the Donald Coal Co. at Stollings, early in December, destroyed seven miners' dwellings and made six families homeless. None of the plant buildings, however, was damaged by the fire.

Whatever may be the outcome of court proceedings in southern West Virginia believed to be indirectly related to the question of unionizing the mines in certain fields where there has been no organization, mine owners in the Kanawha field are still proceeding against union miners occupying company houses. A large number of deputy sheriffs have been engaged for the last week in evicting striking miners, 35 families having been ousted from the houses of the Bellemont Coal Co. at

Crown Hill and about 66 families from the houses of the Campbells Creek Coal Co. on Campbells Creek. Both companies declined to sign an agreement with the union and have made arrangements to operate non-union.

Fire early in December at the plant of the Guyan Mining Co. at Wilbur caused a loss of approximately \$150,000, partly covered by insurance. The headhouse, tippie, conveyor and much other outside plant equipment was totally destroyed, forcing a suspension of operations for the time being. It is believed that the plant will be rebuilt just as soon as possible though just what the plans of the company are has not been stated by the general office at Cincinnati.

The Island Creek Coal Co. has declared an extra \$1 a share on the common stock, besides the regular quarterly dividend of \$2, both payable Jan. 1 to stockholders of record Dec. 19. Three months ago a similar extra dividend was declared. The regular quarterly  $1\frac{1}{2}$  per cent on the preferred also was declared. It is payable on the same dates as the common dividends.

## CANADA

T. W. Scott, chief engineer for the Canadian Collieries (Dunsmuir), Ltd., has been appointed assistant superintendent for the Cadomin Coal Co., Alberta. Fellow members of the Canadian Collieries staff tendered Mr. Scott a dinner and presented him with a Brunton pocket transit.

The Campbell Commission, appointed by the federal government under the Combines Investigation Act, which has been sitting at Winnipeg for some time to inquire into dealings of the Winnipeg Coal Dealers Association, will continue its sittings at Brandon, Manitoba; Saskatoon, Saskatchewan; and Calgary, Alberta.

The Rothwell Coal Co., Avon Coal Co., Harvey Welton and Welton & Henderson Co. have submitted a petition to Sir Henry W. Thornton, general manager of the Canadian National Railways, asking that a spur line of that system be built to the southern mining area at the Grand Lake coal fields. It was promised that consideration would be given this matter. There is a spur line in the southern area but it is from the Grand Lake Coal & Ry. line. Recently the Canadian National built a spur line extending from the transcontinental line across Canada from Moncton to Prince Rupert, connecting with the new northern area developed in the Grand Lake territory. W. B. Evans, manager of the Rothwell Coal Co., presented the petition.

Nearly one thousand miners of the Edmonton District Miners' Federation have joined the Central Council of the Canadian Labor Party following a mass meeting held recently at Beverly.

Reports from the Drumheller field, Alberta, indicate that production has reached a high level, no less than 322 cars passing over the Canadian National Ry. weigh scales in one day recently. The mines are striving to fill

their back orders, but cold weather has deluged them with more business, and the prospects are that it will be some time before they are back to normal. The total shipments for the week ending Nov. 22 were 1,862 cars, as compared with 1,688 cars in the previous week.

W. H. Sutherland, provincial Minister of Public Works, has announced that the government has set aside \$15,000 to be used for road work in the Fernie district, which is to be started at once, with a view to relieving distress among the miners thrown out of work by the closing of the Crow's Nest Pass Coal Co.'s Coal Creek collieries. Charles Stewart, Federal Minister of Labor, who had been asked by the provincial government to co-operate in finding work to relieve the distressed miners, has stated that his department cannot do anything.

According to figures just made public at Ottawa, there have been 145,000 tons of Nova Scotia and New Brunswick coal shipped into Central Canada under the system of bounties amounting to 50c. per ton, established by the Dominion Government on Sept. 2. Of this quantity 28,000 tons went to Ontario and 117,000 tons to Quebec.

## New Companies

**Wilputte Coke Oven Corporation**, Louis Wilputte, president, Augusta, Me., chartered under Maine laws, has filed a certificate of statement and designation in the office of the Secretary of State at Albany, N. Y., to enable the corporation to do business in New York State. The corporation will manufacture coke and gas products and is capitalized at 1,000 shares of no par value. The New York office is 469 Fifth Avenue, New York City.

**The Texas Coal & Mining Co.** has been incorporated in Eagle Pass, Texas, with a capital stock of \$50,000, by C. W. Settle, R. E. Doty and T. J. Evers.

**The Lincoln Coal Co.**, with a capital stock of \$50,000 has been organized in Erie by James Brennan, P. H. Powers, Thomas P. Morgan and T. Woodbury. It is understood the new company will take over and operate a mine, but the directors will not reveal their plans.

The Kansas State Charter Board recently granted a charter to the **South End Coal & Mining Co.**, of Mineral, Kan. The incorporators were Dug Murphy, George Dixon, Tom Young, Bert Hardesty and Joe Frye, all of Mineral. The company is employing forty men in its mine south of Mineral, and expects to increase its payroll soon. The mine, which formerly was operated by the Smith Coal Co., was abandoned several years ago because of faults, but a year ago the men responsible for the new company cleaned up, and since breaking through the fault have been operating it profitably.

A charter was granted recently to the **Englevale Coal Co.** of Frontenac, Kan., by the Kansas State Charter Board. The company, incorporated at \$100,000, has for its president J. S. Patton, and S. I. Patton is its secretary. The announced purpose of the company is to separate the Patton properties near Englevale from the Patton Coal & Mining Co., which operates near Frontenac.

**The Rodgers-Elkhorn Coal Co.**, capital \$50,000, was formed recently for development on 1,000 acres of coal property in the Shelby Creek section of the Pike County border, in eastern Kentucky. T. T., T. F. and G. E. Rodgers, all of Cincinnati, are the men behind the new organization.

A state charter has been issued at Harrisburg, Pa., to the **Hickory Run Coal Co.**, Wilkes-Barre, with a capital stock of \$25,000. The purpose of the company is to mine and ship coal, and the incorporators are: Nat D. Stevens, Tunkhannock, Pa., treasurer; W. D. Phelps, Forty Fort, Pa., and H. M. Reber, Wilkes-Barre, Pa.



## Traffic

### Raise in Coke Rates Denied

It was reported from Washington on Dec. 8 that the Interstate Commerce Commission had refused to approve the proposal of several railroads to increase freight rates on coke from \$2.59 to \$2.90 a ton in car lots from Kentucky, Virginia and Tennessee producing points to Cincinnati, Covington, Newport and vicinity adjacent to Cincinnati.

## Association Activities

The Montreal Coal Association, Inc., has been organized by the wholesale and retail coal dealers of Montreal with the object of putting a stop to malpractices in the trade, more especially the giving of short weight. The association has obtained a provincial charter of incorporation. The following officers were elected: President, R. J. Buck, president of the George Hall Co., of Canada; vice-president, Emile Cool; secretary, Charles Petrie; directors, L. Z. Cohen, L. E. Barrett, L. T. Vipard, D. L. Campbell, H. Aird, J. O. Labreque, J. O. Charlevoix, C. E. F. Dumaresq and G. P. Morgan. The association has a membership of about 100, including nearly all the wholesalers and a large percentage of the retailers.

R. C. Tway, of the R. C. Tway Coal Co., Louisville, operating mines in Harlan County, was re-elected president for the sixth consecutive term of the Harlan Coal Operators' Association, at the annual meeting at Harlan, Ky., Nov. 19. B. W. Whitefield, Sr., of Harlan, was named vice-president, and E. R. Clayton, Harlan, re-elected secretary. The report of the association showed forty-three members, representing an investment of \$25,000,000, and last year these members produced 3,878,008 tons of coal. The Louisville & Nashville R.R. furnished a special train for a trip of inspection over the Harlan district in the afternoon for members and their families. The annual dinner was held in the evening, at which time Harry L. Gandy, Washington, executive secretary of the National Coal Association, was the principal speaker.

## Publications Received

**Annual Report of Coal Mines, State of Alabama, 1923, Including 1922 statistics.** Pp. 160; 6x9 in.; tables.

**Natural Gas in Alberta,** by R. T. Elworthy, Mines Branch, Department of Mines, Ottawa, Canada. Advance section report on Mines Branch investigations of mineral resources and the mining industry during 1923. Pp. 35; 6x9 in.; tables.

**Permissible Explosive, Mining Equipment and Apparatus Approved Prior to Jan. 1, 1924,** by J. E. Crawshaw, L. C. Hsley, D. J. Parker and A. C. Fieldner, Bureau of Mines, Washington, D. C. Technical paper 364. Pp. 30; 6x9 in.; tables.

**Seasonal Operation in the Construction Industries: The Facts and Remedies.** McGraw-Hill Book Co., Inc., 370 Seventh Ave., New York City. Pp. 213, 6x9 in. Price, \$2.50. Reports and recommendations of a committee of the President's conference on unemployment, with a foreword by Herbert Hoover.

**Engineering in American Industry—The Development of Industry in these United States during One Hundred and Twenty Years,** by Conrad N. Lauer, McGraw-Hill Book Co., Inc., 370 Seventh Ave., New York City. Pp. 96; 9x12 in.; illustrated. Price, \$2.50. The book presents in interesting style, by means of text, old pictures, graphic charts, historical and statistical data, the story of the growth of industry and engineering.

**Labor Relations in the Fairmont (W. Va.) Bituminous Coal Field,** by Boris Emmet, Bureau of Labor Statistics, Washington, D. C. No. 361. Pp. 86; 6 x 9 in.; tables.

**A. S. T. M. Tentative Standards, 1924.** American Society for Testing Materials, Philadelphia, Pa. Pp. 763; 6 x 9 in.; illustrated. Price, \$7 in paper and \$8 in cloth binding. Tentative standards for the following are given: Coal and coke, timber, preservative coatings, insulating materials, petroleum products and lubricants.

**The Organization and Functions of the Institute of Research of Lehigh University,** Bethlehem, Pa. Circular No. 1. Pp. 19; 6 x 9 in. Describes the organization and functions of the institute.

**Eye Hazards in Industrial Occupations,** by Louis Resnick and Lewis H. Carris. The National Committee for the Prevention of Blindness, Inc., New York City. Pp. 247; 6 x 9 in.; illustrated. Price, paper bound, \$1.50; fabrikoid, \$2.50. A handbook for safety engineers, safety inspectors, etc.

**Annual Report of the State Inspector of Coal Mines of Arkansas.** Pp. 48; 6 x 9 in.; tables.

**Annual Report of the Board of Regents of the Smithsonian Institution,** Washington, D. C. Publication 2724. Pp. 554; 6 x 9 in.; illustrated. Includes operations and condition of the institution for year ending June 30, 1922.

**Employee Representation Plan; Policy-holders Service Bureau, Metropolitan Life Insurance Co., Madison Ave., New York City.** Report No. 67. Pp. 26; 8x11 in. Summary and brief analysis of employee representation plans recently developed in American industry.

## Industrial Notes

**The Nordberg Manufacturing Co.,** of Milwaukee, Wis., which has for many years constructed hoists, oil engines and compressors, expects to enter in the business of manufacturing underground shoveling machines, a special department having been opened for that purpose.

**The Conveyors Corporation of America,** Chicago, Ill., announce the appointment of C. S. Price, First National Bank Bldg., Hazleton, Pa., as its district representative for northeastern Pennsylvania. Associated with Mr. Price in the sale of the American steam jet ash conveyor is E. E. Elliott, who has had wide experience in steam jet ash disposal engineering.

## Obituary

**T. S. Neel,** aged 60, a prominent coal man of Johnstown, Pa., died suddenly at the home of his brother in Huntington, W. Va., early in December, while on a business trip. He is survived by his wife and two children of Johnstown, Pa., and two brothers, James Neel, of Highcoal, W. Va., and W. S. Neel, of Huntington. Both of Mr. Neel's brothers are engaged in the coal business.

**Thomas F. Kelly,** of Coalport, one of the leading operators in the Clearfield district of central Pennsylvania, died at the Jefferson Hospital, in Philadelphia, Dec. 7, aged 51 years. He was head of the Irvona Coal & Coke Co. He is survived by his wife and nine children. Burial was made at Snow Shoe on Dec. 10.

## Coming Meetings

**American Engineering Council.** Annual meeting Jan. 16-17, 1925, Washington, D. C. American Engineering Council, 29 West 39th St., New York City.

**Northeast Kentucky Coal Association.** Annual meeting Jan. 22, 1925, Ventura Hotel, Ashland, Ky. Secretary, C. J. Neekamp, 816 Ashland National Bank Bldg., Ashland, Ky.

**American Institute of Electrical Engineers.** Midwinter convention, Feb. 9-13, 1925, 29 West 39th St., New York City. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

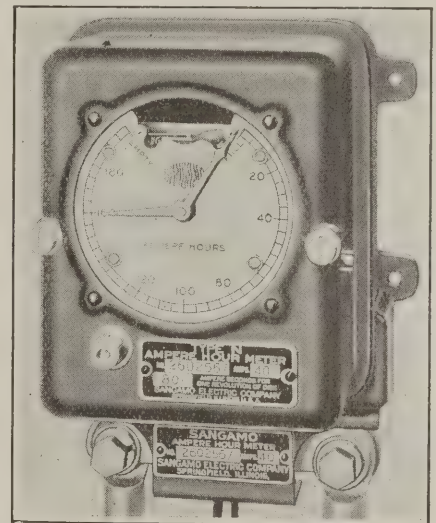
**American Institute of Mining and Metallurgical Engineers.** Annual meeting, Feb. 16-19, 1925, 29 West 39th St., New York City. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

## New Equipment

### Amperehour Meter Takes Bumps and Jolts

The Sangamo meter, recently placed on the market, is designed for installations where the well-known Sangamo locomotive type meter has previously been specified—on electric automobiles, trucks, mine locomotives, industrial tractors, etc., where severe conditions of operation are likely to be encountered.

Installed on the vehicle, truck or locomotive, the meter indicates, by means of a black hand, the amount of battery discharge that has taken place. By



**Amperehour Meter with Non-Spilling Mercury Element**

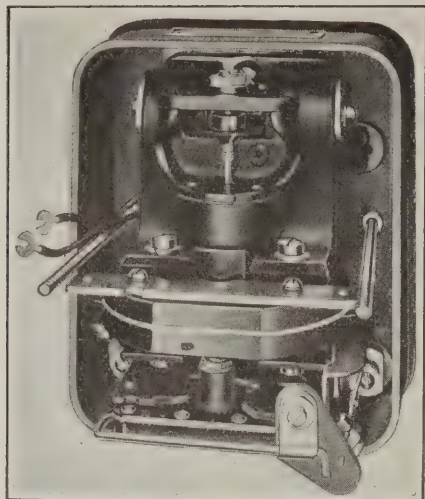
Moisture is effectively excluded so that the formation of mercury dross is retarded.

comparing the position of this hand with a red hand located at the point where the battery should be recharged, the operator can always tell what remaining capacity is available before the battery should be put on charge. This guards the vehicle from being stalled in service.

When the vehicle is placed on charge the amperehour meter automatically gives the battery the required overcharge and opens the charging circuit at the proper time, thus eliminating the need for attendance.

The meter operates on the mercury motor principle and is extremely simple in construction. One set of permanent magnets furnishes both the driving and damping flux and eliminates the need of a separate damping disk. The only exposed moving parts are a short section of the spindle and a small counterweight. The possibility of bearing troubles is precluded through the mercury flotation of the moving element, which relieves the lower bearing of all pressure and produces a slight upward pressure of only one tenth of an ounce on the upper bearing. Because of the cushioning effect of the mercury, the bearing pivots are prac-





### An Over-Charge of Battery Is Easily Obtained

Adjustments can be made to the meter to provide automatic over-charge of the battery.

tically immune from the effects of heavy shocks and vibration.

The armature box is of molded insulation, specially treated to retard the formation of dross. A non-spilling mercury chamber effectively precludes all possibility of the mercury leaking out, regardless of how the meter is handled.

The adjustment of the meter is very simple, being obtained by means of a single clamp slider which can be securely fastened in position, thus assuring permanent calibration.

A variable resistor element with calibrated scale is provided to give the battery automatically the required over-charge.

### Inductive Time-Limit Motor Starter

To meet the requirements for uniform periods of acceleration of motors, the Cutler-Hammer Manufacturing Co.,

Milwaukee, Wis., has developed the controller shown in the accompanying illustration.

Dashpots and other mechanical and electro-mechanical means of timing the acceleration are not employed, the inductive principle being utilized instead. A transformer is used instead of relays, interlocks, dashpots or other moving parts to control the rate of acceleration. The construction of the controller is simple, and there are no moving parts other than the reversing switches, main magnetic switches and the accelerating switches.

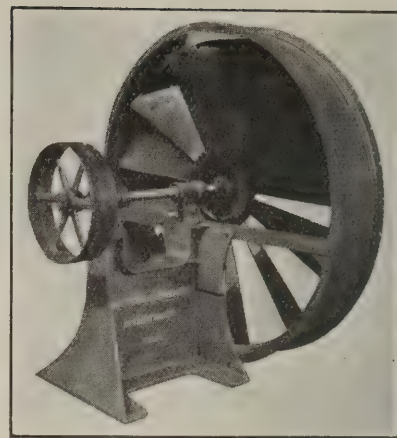
By means of a transformer a holding-out current of transient nature is obtained in successive accelerating switches. Transfer of connections takes place automatically with the cutting out of successive steps of resistance without disconnection of the coil circuits. Adjustments for the timing of the acceleration period of the motor are made on the stationary parts. The acceleration is said to be uniform under ordinary conditions of load variations, the time being somewhat increased on heavy loads.

Particular attention has been given to the ease of replacement of wearing parts, permanency of adjustment, reliability of operation, elimination of ruptured coil circuits and burnouts. Arcing tips are provided and the arc shields of the blowout provide a deep channel in which the arc is disrupted. The main contacts are of the butt type.

### Inexpensive Mine Fan

A new mine fan, designed to handle a maximum volume of air economically, both from the standpoint of original cost and operating expense, has been developed by the American Blower Co., of Detroit, Mich. It is ruggedly constructed in order to withstand general mine usage, and to permit its removal from one location to another without injury.

The assembled fan consists of a disk type wheel surrounded by a steel casing



### Easily Portable Fan

This type fan may be used economically in general mine service. It is ruggedly constructed of steel and cast-iron.

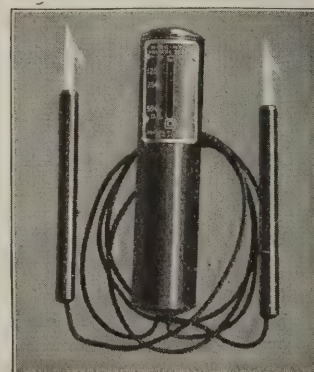
which is fastened to a cast-iron base. This cast-iron base forms the supporting member for two double ball bearings, which in turn carry the shaft on which the wheel is mounted.

So that the wheel may deliver large volumes of air against a resistance, it is provided with twelve overlapping blades securely attached to a large central disk, so as to prevent back flow through the central portion of the fan. These blades are further re-enforced by an annular ring around the periphery of the wheel. The performance is further increased by the use of a steel casing around the wheel to prevent radial discharge of the air. The outfit is arranged conveniently for belting to a motor, or for direct connection, as required.

### Lampless Voltage Tester

A voltage tester which does not require the use of lamps to indicate the voltage has been developed by the Square D Co., of Detroit, Mich. This device differentiates between alternating and direct current, and measures voltages up to 550 volts.

Inclosed in a rugged fiber housing, and of pocket size, the instrument has a broad range of uses, being suitable for locating open circuits, blown fuses and other causes for the irregular op-



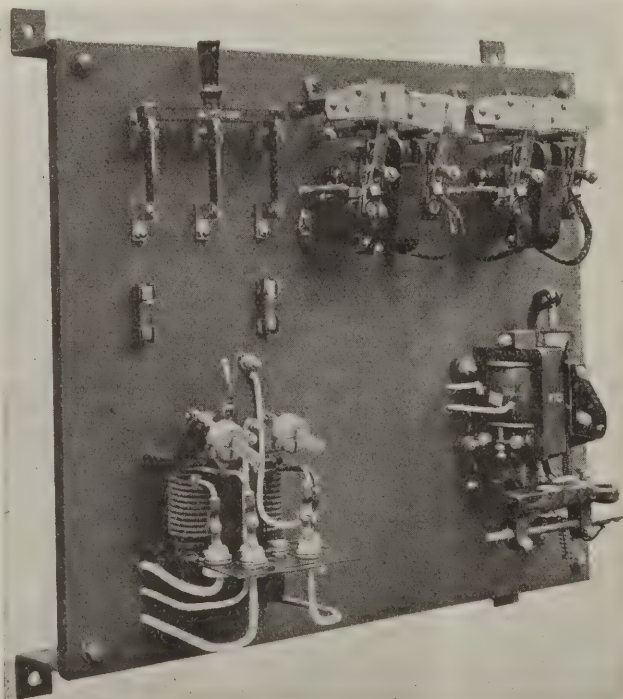
### Voltage Tester of Wide Applicability

This device shows the approximate value of either direct- or alternating-current voltages up to 550 volts.

eration of motors. As a voltage tester it is thoroughly accurate, and therefore may be used to roughly check circuits.

### Time-Limit Starter

Each accelerating contactor is controlled through a transformer which induces a holding-out current of transient value. No contractor can close until the current values are satisfactory for the shunting of the starting resistance.





# COAL AGE

McGraw-Hill Company, Inc.  
James H. McGraw, *President*  
E. J. Mehren, *Vice-President*

Devoted to the Operating, Technical and Business  
Problems of the Coal-Mining Industry

R. Dawson Hall  
*Engineering Editor*

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## A Merry Christmas

**T**HIS YEAR *Coal Age* makes Christmas Day the occasion of one of its fifty-two appearances, and we hope that the spirit of Yuletide is still present when this issue reaches you. After all, those men only are happy who carry the Christmas spirit through the year, dispensing cheer, radiating goodwill, turning up the brighter sides of everything and driving away gloom. Americans are happy people. They work hard but they laugh heartily. Joy is in their labor.

The game of life is worth playing. Let us view it as a game to be played well and lustily but without too much resentment if at times the luck seems against us. Its hazards are as necessary to add spice to existence as are the bunkers in a game of golf. Its rains are fruitful as summer showers if rightly used. Some spirits are destroyed and denuded by them, but others are brought only to a fuller maturity. Many a man whose life seems hard, whose labor would appear unusually distressing can smile more and love more and be more than those whose lives are easier, for he has the Christmas spirit not only at Yuletide, when the fires burn brightly, but through the gloomy days, along sodden pathways. Let Christmas guide and cheer us through the New Year to come.

## New Opportunities, New Methods

**I**N THE Connellsville region, coal companies till recently needed only enough coal to charge their ovens, and they could not build many of them for the field adjacent would be worked out before the life of the ovens was fully spent. So there was no anxiety to get out any more from each mine than a certain tonnage and one that has not for years been considered large. But now the coal goes to byproduct ovens and the river affords a cheap way of reaching them, so a new spirit is again in the air and the Connellsville region—the expression is used in a larger sense than is perhaps permissible—is going to see some big changes. The H. C. Frick Coke Co. has quickly recognized that a new day has dawned.

With the broad vision which it always has had, whether under Thomas Lynch or Walter C. Clingerman, it has adopted large methods. The venture at Colonial will be only one of these doubtless. Perhaps we cannot call it a venture; it was so carefully planned, as Thomas W. Dawson shows us in the article which we publish in this issue. Every difficulty was met in advance, every eventuality anticipated. The relative cost of old and new methods was so carefully weighed that there was no venture after all. It was as certain as any business move can possibly be. But it broke so completely with the past that it set the wiseacres gaping.

Now it is done and the system of reasoning back of it explained, it seems so obvious and so clear that we wonder it was not done before. But nevertheless, it is an achievement of a large order. From a conveyor

line a few hundred feet long a jump was taken to one four miles and more in length. The factor of extension is so large that it makes us start. If the H. C. Frick Coke Co. has done this thing, what may it not do in the future?

## We Compliment Mr. Lewis

**I**T MUST be noted that President Lewis of the United Mine Workers is finally trying to put the screws to the recalcitrant anthracite miners in the Pittston region. He has suspended ten local charters, whatever force or effect that action may have, and thereby deals at least a slap, if not a knockout, to several thousand union miners who thought they were superior to international union authority. They struck, they say, because they thought the Pennsylvania Coal Co. and the Hillside Coal & Iron Co. were not making their mines safe enough and then they refused to go back to work pending arbitration, as the international directed. Today they do not belong to the United Mine Workers of America.

This revoking of charters to compel miners to live up to their contracts with operators is commendable on Mr. Lewis' part. Would that the union president had been more vigorous in the past in his defense of labor contract. Had that been his practice, it is possible there would not have been need for it in Pittston now, even though the anthracite union district organizations are chesty by habit and feel themselves almost if not altogether independent of international dictation.

This is the third unauthorized strike of anthracite miners on a large scale during the year. There has been a good deal of previous opportunity, therefore, for Mr. Lewis to crack down on union offenders in hard coal territory. We will not pretend to explain why he did not do so. The union election is over now, however. Mr. Lewis is safely continued in office, and the question of vote-loss does not enter into the matter of punishing miners' locals for breaches of contract.

## Obit Coal Review

**O**UR READERS will be interested to note that the National Coal Association has decided to discontinue its organ the *Coal Review*. Few, if any, publications of industrial and engineering associations have been found self-sustaining. Most of them are a heavy burden upon the body by which they are supported. The National Coal Association has tried out the venture and knows now just what such an emprise promises. At first it had strong hopes of success, but of recent years it allowed the effort to lag and has not supported the paper by large appropriations.

*Coal Review* and *Coal Age* for years have had a friendly rivalry, both papers circulating among a certain section of our readers. Some persons have contended that an association buttressed by the con-



tributions of its membership has no right to enter into the publishing business. Be that as it may, when an association finds that the information it desires to impart to its readers can be more economically transferred to them in some other way, either by communications at stated periods or when occasion suggests, it is not long in deciding that it will adopt some other method of reaching its audience. *Coal Age* will be happy to serve as a medium for this communication.

The officers of the National Coal Association have always, and doubtless will, continue to show the most friendly co-operation with this publication. It promises to continue that service and even to extend it further if that be possible. That is indeed well. The best way to influence the whole industry is by communications to the press of that industry, made, not in an association paper, but as a press release or letter to the editor. Periodicals do not favor copying material from another publication, however authoritative.

Associations are always hampered in issuing a periodical. Everything that appears in it is regarded as official and implicates the association. Consequently the editors cannot have a mind of their own. This makes the copy relatively unimpressive. A pronouncement made by some official body of the organization, it is true, can be published, but any such statement is now regarded as public property and finds its place inevitably into the public press. As a result no matter who may be the editor, he is not able to put into the paper the independence and promptness of judgment that can be shown by the editorial staff of any private publication. An association organ, being a mouthpiece of the whole organization, cannot lead; it must follow. That is why some of them have omitted editorial comment. Others that regarded their duty as being to support higher prices wrote editorials of a kind that could not fail to please the membership but caused suppression of the association.

The way of such an organ is hard. It is regarded, however, as an opportunity to publish at length in all their interminable verbiage, declarations of the Commonwealth and bills in process of consideration. This adds its value to the publication but tends to prevent its being read. Of late the *Coal Review* largely confined itself to Washington news. It frankly converted itself into a gazetteer of Washington and the Association and did not venture into other fields.

### Growing Power of Mine Workers

**I**N VIEW of the fact that the strikes and suspensions of the United Mine Workers of America are among the most painful memories in our industrial history and in the conduct of our home life we must look with regret on the prospect of having the U. S. Labor Department under the control of the President of the United Mine Workers of America, and the American Federation of Labor under that of the secretary of the same organization.

The British public has suffered so severely from the dominance of the coal miners that it would be well for us as a nation to take warning. The Federation of Labor can do as it will. It is not influenced by the fact that the payment of excessive and unusual wages to miners and the inconvenience of long protracted suspensions will be as harmful to its supporters as it is to the other consumers. But surely the Administration will know better than to put the United Mine Workers

in such power that it can control its destiny without any restraint and without any consideration of the needs of the public. Let Mr. Coolidge resist the pressure that is being placed upon him to put the control of the coal industry into the hands of special interests.

Nothing said here, however, should be taken as inimical to William Green, the new President of the American Federation of Labor. He like his predecessor is no advocate of "Rule or ruin."

### What's This? Strike Talk?

**C**OMES now the official miners' union publicity man deposing and stating in print that non-union coal operators and other "union haters" are basely conspiring to produce a general union strike next April. This new discovery—made afresh every now and then ever since the creation of the miners' union—is based on the alleged facts that the non-union operators want to shut off all union coal so that they can gouge the public, while the other "haters" hope a strike will reduce the weakened union to a state of complete collapse.

Could this be an alibi? Are the hard-put leaders of the Mine Workers turning in desperation to their old tactics? Are they hoping they can somehow engineer a strike as the only way out of their difficulties? Let us see.

Here, in an editorial in the official union organ, appears this passage referring to the conspiracy: "President Lewis is cognizant of this situation. The United Mine Workers as an organization is aware of it. The only alternative to a strike is a reduction of wages to the 1917 level." Decipher that.

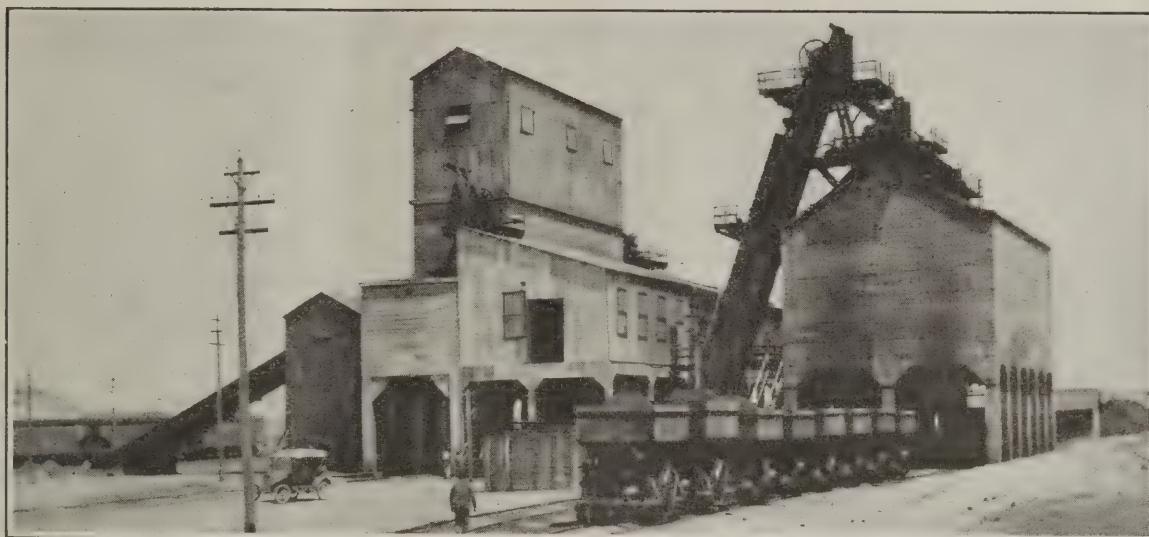
The union has suffered heavy losses of territory in West Virginia, Kentucky, Oklahoma and in such far-flung regions as Crows Nest Pass in British Columbia. It is suffering severely even in the heart of unionism for lack of work. It cannot stand this strain forever. In view of this situation, do the leaders of unionism feel that the Jacksonville agreement is strangling unionism to death and that wages must be reduced by hook or crook as the only salvation? Then how to reduce them!

Mr. Lewis cannot initiate a move for a reduction. He has taken his stand for "no backward step." If he voluntarily changed that position the rank and file would turn and rend him. The task is to produce a popular demand for a wage cut from that very rank and file before the union disintegrates for want of it.

Why not do it by a maneuver that would cause the union to be "forced into a strike? Miners are notoriously tenacious to the cause of unionism when they are striking for the honor and glory of the organization—certainly more tenacious than in a time of high pay and low work as now. If a strike were to run awhile and the rank and file got ready to accept a wage cut, Mr. Lewis would have been saved the ignominy of proposing the backward step, a dangerous crisis for the United Mine Workers would have been passed and the union, even in defeat, would be stronger than a union choked to death with the Jacksonville agreement.

But it is nearly impossible to conceive of a plausible excuse for striking. Certainly it would be a tough job for the miners' union to justify itself before the public even if it were "forced" into a defensive strike. So we can only remark that if Mr. Lewis feels there is nothing left but battle, his stock of resources is woe-fully low.





Washer of Cia. Combustibles de Agujita.

## Men Well Treated in American Mines of Mexico

Reminiscences of Former Official of Cia. Combustibles de Agujita in Coahuila—Care Taken of Safety, Health and Earnings of Workmen—After Mines Were Destroyed by Outsiders, Company Fed Women and Children

By W. A. ROY

Superintendent, Marine Smokeless Coal Co.,  
Rockwood, Pa.

**D**ESPERATE efforts are being made by the labor party in Mexico to discredit the foreign corporations in that Republic because these companies naturally oppose the policy of confiscation advocated by the leaders of that party, but Ricardo Trevino, who is the Secretary of the Mexican Trade Union Federation, made a bad move, when in his letter to certain members of the British Labor Party he asserted that in the mines of Mexico, which produce chiefly coal and silver, no less than 52 per cent of the men are injured every year by accident. Possibly Mr. Trevino did not expect his letter to be published in the English paper, at least did not expect it to be copied in the United States, where there are hundreds of engineers who know how great an exaggeration such a statement is.

Though not connected with any mining or other interests in Mexico, I have visited nearly every mining field in that country, have friends or acquaintances in many of them and for four years was connected with one of the most important coal operations there. As I speak, read and write Spanish I got my facts first-hand and not from "hearsay." A true statement of these facts is even more to the interest of the Mexican workman than to that of the foreign investors, and as I am at present not connected with either, I feel no partiality and will let no prejudice color my story.

Coahuila is the most important coal-mining state in Mexico. Several big coal companies operate in the Sabinas field about 80 miles from the Texas border.

The Compañía Combustibles de Agujita has coal mines at that place, and, at the time I was there, it was one of the fourteen units operated by the Mexican branch of the American Metal Co., all the other units, except one, being metal mines. The American Smelting and Refining Co. operates the largest coal mines in Mexico, at Rosita, just five miles from Agujita, and an English company operates at Cloete, between Rosita and Agujita. All these companies have mines, coal washers and coke ovens and employ from one to five thousand Mexican workmen.

When I went to Agujita in 1917, it was still in process of rebuilding, after a shutdown of several years, made necessary by the burning and dynamiting during the Carranza revolution. Four coal tipples, a washer, the machine shops, foundry, power house, round house, coke ovens, storehouses, hospital, offices, schoolhouses and residences as well as railroad and mine equipment had to be bought or built. One can easily see that it was no light investment for the operators.

### PICKED UP STRENGTH AFTER PERIOD OF WORK

It was pitiful to see the half-starved haggard men who, in ever increasing numbers, flocked in hoping for an opportunity to work. More than we could use came, bringing their families and all their worldly possessions, sometimes packed in the high two-wheeled Mexican carts, drawn by thin patient little "burros," sometimes in a ragged bundle on their shoulders.



At first it took four men to do the work that one good husky American could have accomplished, but it was remarkable that they could work at all, considering that most of them had been living on the "husks of nothing" for about three years and, after they had been with us a month or two, it was hard to believe that they were the same men.

After the four mines were opened and the washer and coke ovens in operation, we employed over two thousand men and though there were, of course, many minor accidents, the company, through self interest, if nothing else, used every means to make them as few as possible. Each man received compensation from the company the entire time he was disabled and for the small stipend of 60 centavos a month he got medical attention and medicine, not only for himself but for his entire family. The doctor in a mining village is usually absolute monarch in his department, and at Agujita he had a druggist and a trained nurse to assist him.

He had also a sanitary corps consisting of twenty

the general manager made frequent inspections, and we all believed that "constant vigilance is the price" of safety. One of our mines was very gaseous and unfortunately the Mexican miner adores his cigarette, but though there were 800 men employed in this gaseous mine, only three fatal accidents occurred in this particular mine during the four years I was with the company and only one fatal accident in all the others. This is not guesswork, but a matter of actual record, kept both by the mining company and by the Mexican civil authorities of that district.

Knowing the miners' tendency to gamble with his life we had safety lamps of the most improved type which were kept in a lamphouse near the head of the shaft under charge of competent and trustworthy men. Each miner received his locked and lighted lamp as he went to work and returned it as he came up the shaft. He was not only required to turn over to the man at the lamphouse any matches or smoking material he might have in his possession, but he was searched to see that he was not hiding any from us, both before



#### Patio and Shops

At Almacén No. 2 mine, Agujita, Coahuila, Mex. The patio is the fenced area in which the town is located. The company removed garbage, oiled water holes and kept the village in sanitary condition. The area occupied by the village merchants outside the patio and the jurisdiction of the company showed neglect.

men whose duty it was to keep the streets clean, to dispose of garbage, to oil water holes and to do any other work the doctor considered necessary for the health of the village. The company employees lived in a part of the town separated from the Puestos—as we called the quarters occupied by Mexican tradesmen—by a small park and a fence, but the cleanliness on one side and the filth on the other made a more striking division.

#### NEVER KNEW MINES WITH FEWER ACCIDENTS

I have been a mine superintendent for twenty years, but I have never known any mines where there were fewer accidents than at Agujita. It was not because the mines are inherently safe nor because the Mexicans are naturally careful. Quite the contrary: but we rigidly required compliance with every safety rule in force in the mines of the United States and added some extra ones made necessary by local conditions, and took every precaution humanly possible to prevent accidents or injury. And here I want to pay tribute to my Mexican mine foremen and firebosses. They had no certificates, I trained them myself, and though they probably would have flunked on any written examination, they were as trustworthy and efficient as any men I have ever had to work with me.

All the Agujita mines were well ventilated and kept clean, and one foreman stayed in each mine eight hours every day, the superintendent visited every mine daily,

entering the cage and after he got out at the foot of the shaft. As one man was discovered to be smuggling cigarettes and matches in his hair you can see that the search needs to be thorough.

#### RAISED WAGES BUT GOT LESS COAL AS RESULT

The Mexican makes a good miner, but he is not what you would call an enthusiastic worker and with few exceptions if he meets his daily needs he takes absolutely no thought of the morrow. To get results one must know his peculiarities and shortcomings and how to sidestep them. For instance we decided at Agujita that we could afford to give our miners a wage increase if it would produce a larger tonnage, and we were chagrined and surprised to discover that the wage increase had just the opposite effect from what we desired and expected.

On investigation we discovered that from the time the wage increase went into effect most of our best miners had acquired the habit of taking from one to three holidays a week. They were making enough for their actual needs on the old schedule and so higher pay only meant more leisure for them and we had to work a new scheme on them. We revoked the wage increase and gave them a tonnage bonus which amounted to the same thing, only if a man did not work regularly and get out the tonnage that the foreman and I decided was reasonable he got no bonus. The scheme worked beautifully, and we doubled our



output, but perhaps Mr. Trevino would consider this cruel and barbarous treatment.

Care to prevent accidents may be due to self interest but, self interest does not dictate all that the companies in Mexico do for the welfare of the people; nearly all mining villages and all of those belonging to the large companies, have recreation buildings and equipment, schools, medical attention and supervision, and all the officials of the company are instructed to, and do, take a personal interest in the welfare of the people in the village.

#### INFLUENZA WORKS HAVOC EVERYWHERE

In the big "flu" epidemic of 1918 our whole camp was stricken as with a plague. I have had to help men up out of the mine and have them carried home, who went to work in the morning apparently in perfect health. Hundreds of our workmen and their families were stricken at one time. We had orders from our company to feed at the company's expense all families where the wage earners were ill, to give them all the medical attention they needed, to furnish coffins and to bury free all the dead and to do everything possible for the living. Of course money could not buy adequate medical attention. No extra doctors were available, for the plague raged everywhere, but our doctor ate and slept (if he slept at all) on the move, and every mine official, who was not himself ill, devoted all the time his work left him, to helping the doctor in his work. The fatalities were enormous, for the Mexican seems to lack stamina to resist disease. However, compared with that in the native towns, under native management, our mortality rate was almost negligible and fortunately the plague was not of long duration.

From 1918 to 1920, Agujita, barring a few bandit raids and excitements, was a peaceful, prosperous little mining town where work was plentiful and well paid, the people busy and contented, with the exception of a few malcontents who could be satisfied only by what Harry Lauder defines as a labor government, "All play, no work and all pay," when almost over night a crowd of agitators, from God knows where, invaded our camp, gathered in our malcontents and organized a sort of a local Soviet. How failing to get our men out by

oratory they resolved to use force, seized the power plant, and forced the men out of the mines by shutting off the ventilation, how they made "Muere los gringos" (Death to the foreigners) their slogan, and after asking impossible concessions of the company and being refused, they with de la Huerta's connivance, seized the mines and made a glorious fiasco of operating them, is too long a story to put down here, but that even under these circumstances the "Gringo" organization was not indifferent to the welfare of the people is proven by the following letter sent out from company headquarters:

#### FEED FAMILIES OF MEN WHO SEIZED MINES

Compania de Combustibles Agujita

Sabinas, Coahuila.

Gentlemen:

We acknowledge receipt of your letter of Oct. 16, and from copies of letters written to Mexico City, we think you will see our point of view, with regard to what we wish to be done at your camp.

In view of the fact that the mines have been flooded, pumps drowned and fans have stopped you can now assure any of the men with whom you talk, that we are not in any hurry whatsoever to start up the properties and that as long as the agitators who have brought all this trouble continue in this district, we would just as soon remain idle. We feel sure that the trouble has all originated with the agitators who have come into your camp and that it will pass with them and that they have willfully and maliciously deceived the miners and other men who work for you and that they must be defeated.

Referring to last paragraph of your letter, we wish to say that we do not bear any malice to any of the men, except the agitators and we do not wish to see the women and children suffer from hunger. We desire that you make every effort to locate any that are actually in need and see that these women and children are fed. We do not wish to feed any idle men, but we think that you can arrange to have some of the Mexican women in the camp work for you making tortillas and soup and cooking beans, and you can let it be known that any women and children who are hungry will receive one good meal a day at the company's expense.

Please advise if you can fix up this free kitchen and service and make every effort to help those who are in need of help.

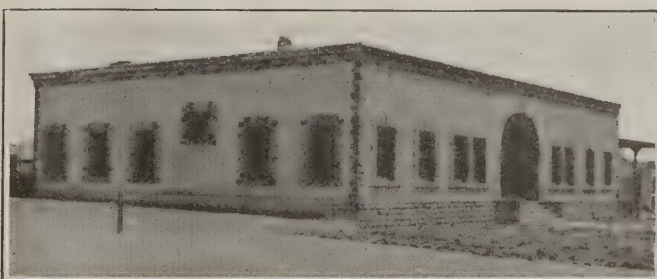
COMPANIA MINERA DE PENOLES.

I have written only of the companies for which I worked but almost everything I have said of this company is true of all companies formed by foreign capital in Mexico. The real workmen know they are better treated and better paid, under foreign than under native management, but unfortunately it is never the real workman who gets his views into print.

Manager's residence on right, a low ranging building with good ventilation and high rooms.



Ventilating fan at mine No. 2 on left below and company's office on right also below.





## Matanuska Coal Field Mines Only 7,000 Tons Monthly

Coal Varies from Lignite to Anthracite—Latter Is In Places 40 Ft. Thick but Folded and Penetrated by Dikes and Sills

**D**ESPITE all that has been said of the fortunes in coal that might be made out of the Alaska coal fields, the Bering field is still undeveloped and the Matanuska field is only producing 7,000 tons a month, less than two or three shafts in the United States can and have hoisted in a single day. What follows regarding the latter field is published on the authority of the U. S. Geological Survey.

The Matanuska coal field, which contains one of the most valuable coal reserves in Alaska, extends from an area near tidewater at the head of Knik Arm, an inland extension of Cook Inlet, eastward to the upper valley of Matanuska River, reaching a point within 8 miles of Matanuska Glacier. The Matanuska branch of the new Government railroad taps this coal field and draws from it much of the fuel used on that railroad.

Although the coal-bearing formation is of the same age throughout the field the coal shows a wide range in character. At the west end of the field, where the beds are only a little deformed, the coal is a lignite. Farther east, at Moose and Eska creeks, where the beds are somewhat folded and faulted, they contain bituminous coal of good grade, which is now being profitably mined to an extent justified by the market demand. Here several mines are now producing about 7,000 tons a month. Still farther east, in the vicinity of Chickaloon, the terminus of the Matanuska branch of the railroad, the coal is a bituminous coking coal of the first rank, but the structure of the beds is more complex than at Moose Creek. The coals of the highest grade, which are found on Anthracite Ridge, 12 miles east of Chickaloon, include anthracite of superior quality, but the beds are highly complex in structure. No attempt has yet been made to mine this anthracite.

### SURVEY RECENTLY COMPLETED

The part of the Matanuska Valley that includes the area near Chickaloon and the area immediately east of it form what is generally known as the upper Matanuska Valley. A survey of the upper Matanuska Valley, an area which is about 10 miles wide and extends 18 miles eastward from Chickaloon, was completed in 1924 by S. R. Capps of the Geological Survey, Department of the Interior, whose work supplemented a survey of a part of this area made in 1913 by G. C. Martin and associates. The lower part of the Matanuska coal field has already been surveyed. A report showing the results of the work done in 1924 is now in preparation.

No mines are now regularly operated in the upper Matanuska Valley. Mines opened from 1920 to 1922 by the Alaska Coal Commission at Chickaloon and on Coal Creek produced coal of high grade, but the beds were so much broken up or altered by faults and bodies of intrusive rock as to make the cost of mining very high, so that the work was stopped. Development work at a mine on the west bank of Coal Creek, however, is being continued by a private company.

The field work of 1924 indicates that the coal-bearing area east of Chickaloon is somewhat smaller than had been supposed. The dominant structure of the basis

is synclinal, and considerable areas of it that lie south of the axis of the syncline are now thought to be stratigraphically below the coal-bearing horizons at Chickaloon and to contain no workable coal. The coal beds at Coal Creek and at O'Brien Creek are believed to lie in faulted synclinal folds, most of the coal having been removed from the corresponding anticlinal folds by erosion. The reserves of minable coal at each of these places are believed to be limited to a few hundred thousand tons.

The coal-bearing area on the south flank of Anthracite Ridge contains beds carrying anthracite coal of excellent grade, which is exposed at many places. At a place on the head of West Fork of Purington Creek a bed of anthracite nearly 40 ft. thick crops out. In this area, however, the coal-bearing formation is highly disturbed by folding, crumpling, and faulting, as well as by bodies of intrusive rock, such as dikes and sills. The coal beds appear to lie in synclinal basins, most of the upper part of the folds having been removed by erosion. These beds no doubt contain considerable excellent anthracite coal, but whether it occurs in beds sufficiently large and continuous to justify the expense of mining is uncertain in view of the cost of building a railroad to it. Little prospecting has been done on the anthracite beds, and whether they include workable bodies of coal can be proved only by extensive exploration, both on the surface and underground.

### WILL NOT PAY COST OF BETTER COAL

The beds of bituminous coal near Chickaloon are so complex in structure that the coal cannot be mined for general use in steam raising in competition with the more cheaply mined coals of the lower Matanuska Valley, where, though the coals are of lower grade, the structure is simpler. The utilization of the coals of the upper Matanuska Valley depends on the development of a market for superior coals that cannot be supplied from the other beds in this region, on a price sufficient to yield a profit, notwithstanding the comparatively high cost of mining them, and on their ability to compete with coals of similar grade mined in other fields. The high-grade blacksmith coal of the Chickaloon area and the anthracite must compete with coal mined in the eastern part of the United States, but the cheapness of transportation of the high-grade Matanuska coals to markets on the west coast of the United States should favor their development. It is also possible that the market for the somewhat lower grade bituminous coals now being mined in the Moose Creek and Eska Creek districts could be extended to supply a demand now met by similar coal mined on Vancouver Island.

### Headframe at Rachel Mine

One of three shafts at this mine, all 360 ft. deep. The coal is hoisted by electricity. Coal is screened into 4-in., 2-in., ¾-in. and slack.

Courtesy  
Bertha-Consumers Co.







Colonial Docks

## Four-Mile Belt Line Carries 9,426 Tons of Coal In One Day at Frick Company Mine

Nineteen 48-In. Belts and One of 60-In. Deliver to River Dump All Coal from Three Mines Formerly Entered by Shaft—Thirty-Five Cars Discharged at One Time by Each of Two Revolving Dumps

BY THOMAS W. DAWSON  
Chief Engineer, H. C. Frick Coke Co.,  
Scottdale, Pa.

IN 1916 the H. C. Frick Coke Co. completed the arrangements necessary to load all coal from its mines lying directly along the Monongahela River in barges for transportation by water to the Clairton byproduct ovens. The plans of the U. S. Steel Corporation called for a further extension of its Clairton plant, which would require about 50,000 more tons of coal weekly than could be furnished by the river mines already equipped. Hence, it was decided to develop other coal for river transportation. This necessitated taking coal lying farther back from the river than was usually thus transported.

Colonial Mines Nos. 1, 3 and 4, of the H. C. Frick Coke Co. could be reached through the Alice Mine, of the Pittsburgh Coal Co., which was being operated as a river mine. These latter workings were almost exhausted and their main headings reached to the boundary of the Colonial coal field. A careful examination of the mine was made, and it was purchased from the Pittsburgh Coal Co. as an outlet to the Monongahela River for the three Colonial mines to which a large field of coal had been allotted. Probably the best way

in which to define its size is to say that it will have a life of twenty-five years when worked at the rate of 8,500 tons per day for 300 days in the year. After the purchase of this mine no further work was done until the Spring of 1918.

The problem facing the H. C. Frick Co. was the mining, transporting and loading in barges of 8,500 tons of coal per day, of which Colonial Nos. 1 and 3 were to produce 3,000 tons each and Colonial No. 4, 2,500 tons per day. Each of these mines was producing coal for the manufacture of coke in beehive ovens, having a total daily production of 3,350 tons for the three plants. This made it necessary to furnish each of these mines with sufficient equipment and also with the housing facilities for the additional men that must be employed if the needed tonnage was to be obtained from this field.

The coal being produced at this time was being hauled away from the river in most cases to the three shafts where it was hoisted and coked, and the coke shipped by rail to the steel plants. This arrangement made it possible to keep up operation without interference until the new scheme was completed, when the haulage was simply reversed and the coal taken to the river making the equipping of the mines a simple matter. They had to be supplied only with additional power,

NOTE—Article entitled "Underground Belt Transportation of Coal," read before the Coal Mining Institute of America, at its Pittsburgh meeting, Dec. 4.



mine wagons, mining machines and new haulage roads leading toward the river.

On the surface, a new town was built at each of the mines to accommodate the additional men required in the production of the larger tonnage. Attractive houses were built and the towns well laid out with graded streets, shade trees and sidewalks. A filtration plant was built to furnish both the old and new towns with filtered water, which was piped into the houses. Many of these dwellings have bathrooms and all are equipped with electric lights. A large boarding-house and bath-house were built at each town and all possible care taken to provide for the comfort and convenience of the men employed.

The improving and equipping of these three mines to produce the required tonnage was a comparatively simple matter, but the transportation of this output from the working face to the river was a problem which required careful consideration.

Naturally the first scheme considered was the transportation of this coal by electric locomotives and this method would undoubtedly have been adopted had not more than ordinary difficulty been encountered in providing adequate haulage roads.

#### HAULAGE TRACKS WOULD BE INADEQUATE

When Alice mine was purchased from the Pittsburgh Coal Co. it was almost completely mined out. Two headings remained from the boundary of the Colonial field to the river, but little pillar coal was left to support the roof. In fact, in several places the pillar on the outside of the headings had been pierced by room work, and holes had been stopped with burlap sacks in order to maintain proper ventilation. It was not possible to provide more than two tracks from the Colonial mines to the river. One of these must accommodate loaded, and one empty trips. Extensive roof protection was necessary in both of these headings to protect such important haulage-ways as these would have to be.

The mouth of this mine is just beneath the tracks of the Pittsburgh & Lake Erie R.R., and only a few feet above high water level of the river. The entire bank between the railroad tracks and the river, where the outside landing and river tippie had to be located, moves toward the river every year, necessitating extensive foundation work for the large trestle and tippie which would be required to handle this tonnage. The wagons in use at these mines had an average capacity of about 2.1 tons each, and, to produce 8,500 tons per day, would require handling about 4,000 of these wagons, or forty trips of one hundred wagons each. This would allow only 12 min. between trips regularly throughout an entire eight-hour day.

The H. C. Frick Coke Co. has had some experience with derailments, and this looked like a large undertaking. It was decided to abandon this small wagon, and one was adopted, for estimating purposes, of 3½ tons capacity, reducing the number to be handled to about 2,400, or twenty-four trips of one hundred wagons each, which, on such grades as must be traversed, require the use of a 75-ton locomotive to handle the load. An estimate of the cost of completely equipping these mines on this basis was prepared, but, due to the necessarily expensive outside arrangement and the danger anticipated from the sliding of the river bank, the scheme appeared unsatisfactory.

Four of the H. C. Frick Coke Co.'s mines were delivering their entire output on the river, all of which was

carried on belt conveyors from the shaft to the river, an average distance of about 500 ft. These were operating very satisfactorily, no delays being experienced in the operation of these installations. This led the staff of the H. C. Frick Coke Co. to conceive the idea of making the terminal of the locomotive haulage inside the mine where sufficient trackage could be obtained, transporting the coal outside to a much simplified tippie on the river. This would eliminate most of the danger from slides, decrease the length of locomotive haulage and materially lessen the cost of the loading arrangement at the river.

Further study along these lines indicated that, in order to get a satisfactory inside terminal for the locomotive haulage, the mine conditions would make it necessary to go back so far as to require an extensive system of belt conveyors. A careful analysis of the cost of operation of the various belt conveyors already in use gave conclusive evidence that these units could be installed in considerable number and operated at a saving over the original scheme involving locomotive haulage. This led the company to look into what then appeared a rather daring scheme.

As already stated, the size of the mine wagons would have had to be increased if the scheme of locomotive haulage had been adopted. The mines had 996 mine wagons already in service, most of which were in good operating condition. By taking the belt-conveying system back to a point or points where it could be reached by the existing equipment, the tonnage could be produced simply by purchasing a comparatively small quantity of new equipment for these mines and utilizing everything already in service. Two points in the field were selected. At one of these the Colonial No. 4 was to discharge its output. The other was for the discharge of coal from Colonial Nos. 1 and 3. Landings were planned separately for each mine so that each could operate as a separate unit with no interference from the other and with none of the mines using common tracks. This would allow the management to hold each mine responsible for its tonnage in exactly the same manner as if it had been delivering to its own shaft bottom, as it had in the past.

#### FIRST SCHEME PROPOSED TWO-CAR DUMP

A double landing was proposed for Colonial Nos. 1 and 3, each side having its own two-car rotary dump with both dumps discharging through a common hopper to an apron feeder designed to feed 860 tons per hour to a belt conveyor of the same capacity. Colonial No. 4 was to have a landing with a dumping arrangement of the same kind, served by a branch belt fed by an apron conveyor at the rate of 360 tons per hour. The conveyors from Colonial Nos. 1 and 3 were to be 42 in. wide, and from Colonial No. 4, 36 in. wide to their junction, from which point all remaining conveyors were to be 48 in. wide and carry 1,220 tons per hour. This rating would allow the proposed output to be handled from these mines in seven hours' working time, allowing one hour for unavoidable delays.

A detailed estimate was made along these lines for comparison with the one already made on a locomotive-haulage system, and it was found that the initial cost of the belt-conveying system would be less than the locomotive haulage system and would effect a slight saving in operation. These estimates were carefully checked several times during the next year, and the management was finally convinced that the belt-convey-



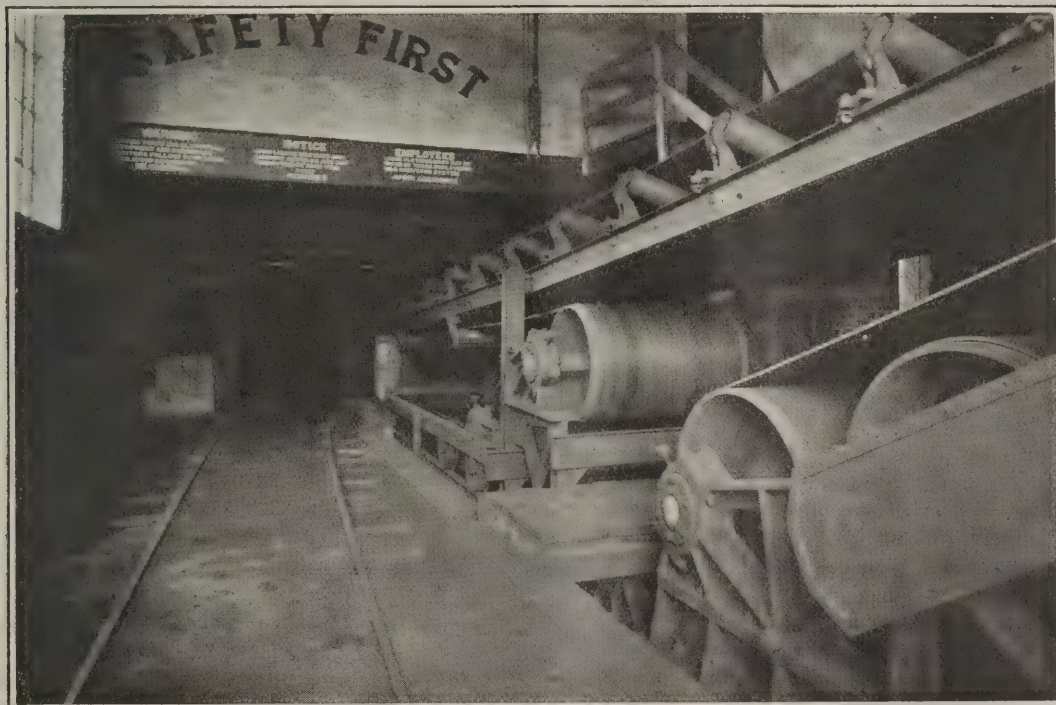
ing system was the correct plan for this project. Sufficient money was appropriated to cover the cost of the entire project, including new towns, water system, new electric power system, additional mine equipment and the conveying system, and the work actually started in October, 1920.

Specifications were immediately issued and bids on equipment asked from all the manufacturers of conveying equipment in the country. The designing at the start was naturally required to proceed with the work in the field, on account of the many limitations encountered which would not exist in outdoor work. All water entering the headings must be drained away and pumped outside. This makes it necessary to fix the grades on the conveyor to correspond with the drainage grades as nearly as possible. Ventilation must be taken into account. Grades must be established that will make it unnecessary to disturb either roof or bottom and adequate roof protection must be provided at all points.

It became obvious early in the development of this scheme that it would not be advisable to drive any of

give a clear discharge of the coal from belt to belt. This made a careful design of chutes between conveyors necessary and also made it obligatory to locate the drives back of the head pulley where they could be kept close to the floor. Throughout the part of the system located in the old Alice Mine headings these drives were all located in break-throughs where little additional solid coal had to be removed. In all cases the drives were kept as close to the head end of the conveyor as local conditions would permit.

At the very start of the design of this conveying system it was evident that it required little ingenuity to put together a series of belt conveyors to carry coal at the specified rate for this distance, but that the designing of such a system, keeping the cost, maintenance, power and attendance down to a point where it would be a truly economical system, was a real problem. In solving it the view was taken that the power for driving a conveyor is the most important consideration. The actual power consumption, though a considerable item in the operating cost, is the smallest measure of its importance in the design. The power required



#### Tandem Drive with Take-Up

Near the end of Belt No. 2 at the entrance to the Colonial Mine. Note the track which nearly all the way follows the conveyor line and is used for the lubrication car and as a supply track for the maintenance of the conveyor. As the old Alice Mine had a double track there is plenty of room for this track and the belt, side by side. Note also the cross beams. Throughout the Alice Mine passageway, steel work or brick arches have had to be provided.

these conveyors at the head pulleys, as is ordinarily done. The roof in this mine will stay up fairly well if the checker slate above the coal is not broken, but as soon as this is fractured high falls are almost certain to occur. This condition, if for no other reason, made it necessary to keep the height at which one belt discharged to the next one in the system as low as possible.

It was made clear in the comparison of operating costs of the two schemes that one of the main factors operating against the belt-conveyor system was the power required for its operation. It was apparent that a large part of this excess power was required to lift the coal the extra height at each belt intersection that would enable it to deliver the coal to the next unit. Where twenty units were required, the lifting of 8,500 tons of coal per day a matter of only a few inches at each intersection would show on the annual power bill.

These two considerations made it essential to keep the height between the tail pulley on one conveyor and the head pulley on the next to the minimum that would

fixes the size of motor and control, the size of the main shafts and the gear reduction and the ply of the belt, all of which directly affect the installation and overhead costs and, just as surely, the maintenance and replacement costs.

As a first step a series of power tests was run on the four conveyors already operating along the Monongahela River, and a formula was developed which would as nearly as possible fit all when length, speed, load and lift were taken into consideration. Knowing the conditions under which these conveyors were operating, this was considered a good basis from which to start in designing conveyors of a much greater efficiency. With this data lengths of conveyors were established with which it was certain the belts could be driven successfully. The data shown in Table I were compiled and from these the entire system was developed step by step.

It was believed that the first consideration in power reduction was the development of a better carrier than



had yet been placed on the market. The engineers started systematically "talking carriers" with all manufacturers and got as many as possible interested in making improvements which would meet the needs of the installation. The first requirement specified was that all bearings should be of high-grade anti-friction type with either ball or roller bearings. Lubrication must be positive and a system adopted which would make every bearing easily accessible for the future application of lubricant and reduce to a minimum the labor involved in taking care of the lubrication.

In this system there are in service 6,598 carriers, which makes the attendance to bearings and their proper lubrication important. To get the highest possible efficiency from these carriers every bearing must be in perfect condition, and, in order to keep them so, they must always be lubricated thoroughly. This brought up the question as to the number of pulleys to the carrier and a consideration of the three-pulley type was started at once, in order to reduce the number of bearings and, consequently, the amount of attendance necessary. The question of belt wear necessarily had to be considered when entertaining the idea of a change from the five-pulley type which has become practically standard. This was given much consideration and a meeting finally was held with several of the foremost manufacturers in which this feature was discussed for almost an entire day in open meeting. As a result of this study, the three-pulley type was adopted. This reduced the number of bearings, and, consequently, the number of places to be lubricated, from 65,980 to 39,588, a reduction of vital importance. With the three-pulley carrier adopted, the trough of the belt is practically the same as with the five-pulley type. It appeared certain that the carrying capacity of the belt would not be reduced materially.

#### BIDDERS FURNISH MODELS

Each manufacturer submitting a bid was required to furnish a sample carrier of the type proposed in his proposition. When all these were received and set up in one room, an excellent collection was available from which to choose, and they were carefully examined before a final selection was made. It became apparent, soon after bids were examined, that to get what was wanted for this system it would be necessary to consider each item of the equipment separately and purchase each major part of the equipment from the manufacturer giving the best in its line.

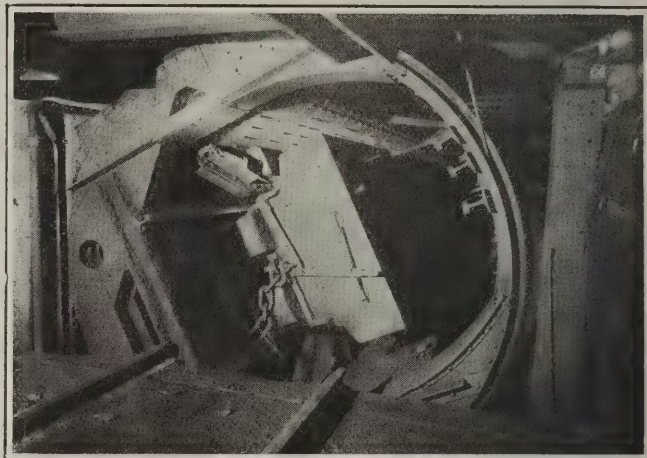
The carriers were purchased from the Stephens-Adamson Mfg. Co. This is a three-pulley carrier equipped with No. 204 S. R. B. annular ball bearings. It is substantially made, and all castings are of malleable iron. The bearing housings are of malleable iron, designed with a liberal grease reservoir and mounted so as to oscillate and thus take care of any inaccuracies in alignment—either in manufacture or due to accidents to the equipment. It has one unique feature which has proven very useful in operation. The entire upper part of the carrier pivots on a fixed shaft, allowing it to be turned back under the belt and laid down on the decking, thus permitting each unit to be examined and repaired, if necessary, while the belt is in operation. The return carriers are made of 7-in. tubing with a through live axle and supported at each end on the same bearings in the same mountings as used in the troughing carriers.

After selecting the carriers it was decided that none

of the drives submitted in the original proposals from the manufacturers were satisfactory, and another drive was designed in the company's office which would answer the purpose, new bids being obtained based on this design.

The motors, which were purchased from the General Electric Co., are of the wound-rotor type, 2,300-volt, 3-phase, 60-cycle, 900 r.p.m., the driving pulleys being required to make 40 r.p.m. The motors were to be set in separate drive rooms located back in the coal, and it was very desirable to take all gears out of the main gallery in order to conserve space and remove all possible hazards in operation. A double reduction gear box was designed as a unit to be installed in the motor room between the motor and the tandem driving pulleys. These pulleys were connected to the gear-reduction unit by two extension shafts fitted at each end with flexible couplings of the rubber-bushed pin type to allow for errors in alignment. Cut-steel herringbone gears of small diameter and wide face were used, and all shafts were mounted on high-duty Hyatt bearings.

This construction was adopted in order to get the highest possible efficiency from the drives and to allow



**Rotary Dump Discharges 35- to 40-Car Trip**

Not an impressive illustration, but the dump is 374 ft. long and has a hopper beneath it holding 1,250 tons and thirty-four duplicate feeders which deliver coal to the belt as it is needed, preventing the overloading of the conveyor and providing, to a large extent, against underloads. Without such a stabilizer as this hopper and feeders the belt would travel empty quite a proportion of the day.

the entire unit to be made accurately at the factory, assembled, tested and shipped complete inside the gear box ready for erection in its room. All gears run in oil, and the roller bearings are equipped so as to be readily accessible for lubrication. The connections between the gear boxes and the motors are made with Falk-Bibby couplings. Seventeen duplicate units of this kind and three of similar construction, but for single drives, were used in this installation. This equipment was purchased from the Falk Corporation.

All drive and head pulleys are of 48 in. diameter, cast-iron, with split hubs mounted on 7½-in. diameter shafts. These shafts are carried by two 6x7-in. heavy duty Hyatt bearings in specially designed ball-and-socket housings. Heavy cast-iron bases are used to mount these bearings. In the erection these bases were accurately set to alignment and level, with no provision for adjustment. This worked out nicely, saving time and giving perfect satisfaction. All snub and tail pulleys are of 36-in. diameter, with 5½-in. diameter shafts, equipped with 5x4-in. heavy-duty bearings mounted in the same way as the larger ones.



The driving pulleys are lagged with 4-ply rubber belt. On the tandem drives the belt is laced underneath first, thus putting the clean side of the belt against the main driving pulley. Each drive has a take-up pulley weighted to apply about 2,000 lb. initial tension to the belt. Just ahead of each take-up pulley is a snub pulley which is provided with a solenoid brake to stop the conveyor and hold it in case there is sufficient lift to cause it to run backwards after the power is shut off. The Stephens-Adamson Mfg. Co. supplied this equipment.

After this type of equipment was selected a complete conveying system was obtained on which every bearing was either of the ball or roller type and the lubrication taken care of as carefully as possible throughout the entire system. The large roller bearings required in the drives added considerably to the expense of the installation. By this refinement an actual saving in the installation cost was expected, and basing the figures on this class of equipment the figures shown in Table II were prepared which, when compared with those in Table I, show that it was possible to reduce the ply of the belt required from a ten-ply in a large part of the system to a uniform eight-ply throughout the entire system. This reduced the cost of the belt on the entire installation about \$50,000, paid for the bearings and more than justified expectations in regard to reduction in power, as will be shown later.

To provide for lubrication, every bearing in the system was equipped with an Alemite fitting. A special grease car has been built carrying a barrel of grease and a compressor for forcing it through a flexible tube which reaches all the bearings. By the use of this car all equipment can be lubricated at any time. This allows fixed periods to be set between complete lubrications of the equipment. Everything is so arranged throughout the system that every bearing can be lubricated with a standard grease gun while the conveyors are running, if this should ever be necessary.

After taking care to reduce friction to a minimum in all the mechanical equipment, the fact that friction just as serious may be developed within the load carried was not disregarded. In case the belt is flattened out at any place the load loses its form and must be forced back to its original shape in going through the next carrier. This requires power and may readily

Table I—Tentative Description of Colonial Transportation System

With Calculated Power Requirements and Belt Tensions Without Anti-Friction Bearings

Belt No.	Width, In.	Capacity, Tons	Drive	Length, Ft.	Rise or Drop, Ft.	Start Hp.	Running, Hp.	Belt Ply	Belt Tension, Running	Unit Stress,* Lb.
1	48	1,220	Single	800	— 2.25	248	80	8	8,889	35
2	48	1,220	Single	417	+ 8.1	140	54	8	6,000	31
3	48	1,220	Single	320	+ 4.5	106	39	8	4,334	23
4	48	1,220	Tandem	1,029	+19.6	347	132	8	9,680	38
5	48	1,220	Tandem	1,101	+19.6	369	139	8	10,193	40
6	48	1,220	Tandem	1,497	Level	470	157	10	11,513	40
7	48	1,220	Tandem	1,401	—12.23	425	132	8	9,700	38
8	48	1,220	Tandem	1,500	Level	470	157	10	11,513	40
9	48	1,220	Tandem	933	+11.25	306	111	8	8,140	32
10	48	1,220	Tandem	1,413	+11.2	457	161	10	11,807	42
11	48	1,220	Tandem	1,513	+ 2.72	478	161	10	11,807	42
12	48	1,220	Tandem	1,321	+19.12	438	161	10	11,807	42
13	48	1,220	Tandem	1,324	+23.6	444	167	10	12,247	44
14	48	1,220	Tandem	1,342	+21.07	444	167	10	12,247	44
15	48	1,220	Tandem	1,296	+23.87	444	167	10	12,247	44
16	42	860	Tandem	1,263	+26.3	302	116	8	8,507	34
17	42	860	Tandem	1,366	+17.47	302	116	8	8,507	34
18	42	860	Tandem	1,214	+30.47	302	116	8	8,507	34
19	42	860	Tandem	1,278	+24.97	302	116	8	8,507	34
20	42	860	Tandem	1,212	+30.67	302	116	8	8,507	34

\* Stress in lb. per in. of width per ply.

become a source of increased power consumption. In order to avoid this, the load must be carried along in a perfectly quiet state with absolutely no changes in its physical form. To accomplish this, all changes in grade over vertical curves were made of as long radius as possible, using troughing carriers throughout the entire top run. Carrier spacing was fixed at an average of 3 ft. 6 in. with graduated spacing from the head to the tail end. Various other spaces were tried on a few conveyors, but no accurate data have yet been obtained. In the erection of carriers, marks were set on the steel stringers on each side at right angles to the center line of the belt to insure accurate spacing and alignment of carriers. All carriers were clamped to the steel stringers in order to allow of readily changing the spacing.

The belt for this system is 8-ply, 32-oz. duck,  $\frac{1}{8}$ -in. rubber-covered, with the exception of one of the shuttle conveyors, the 60-in. feeding belt, No. 20, under the dumping hopper and belt No. 19, which are fabric belts manufactured by the Imperial Belting Co. The other belts are divided nearly equally between the Goodrich and Goodyear rubber companies.

It was recognized that, on a system as extensive as

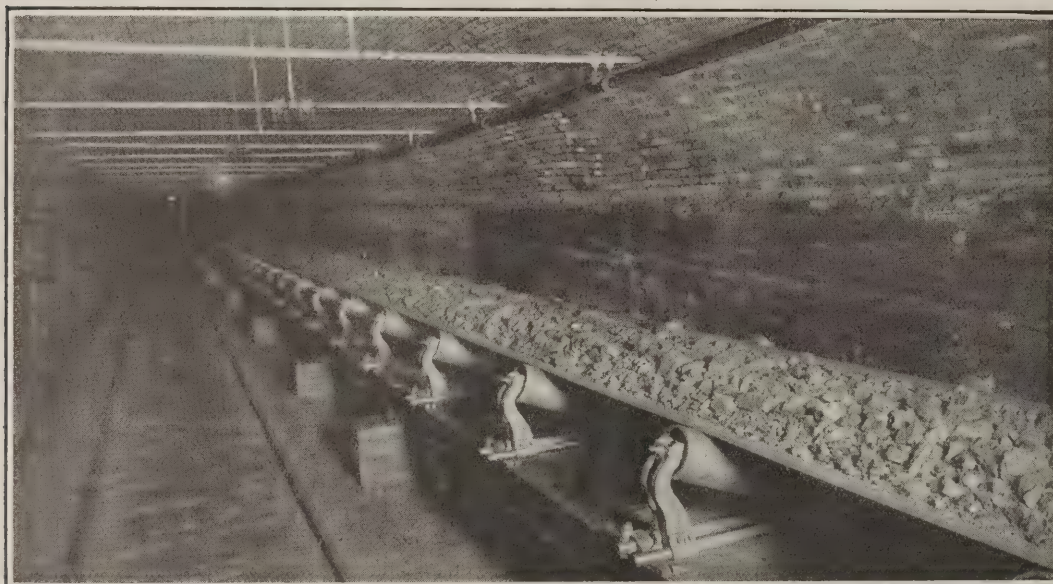
Table II—Belt Data for Accepted Scheme, Compiled Before Installation, Assuming Use of Anti-Friction Bearings

Belt No.	Length Between Centers, Ft.	Net Rise or Drop	Estimated Weight Running Parts Empty — Tons	Estimated Weight Coal @ 1,220 Ton Hr. — Tons	Estimated Weight Running Parts Loaded — Tons	Tension Load Car- ried by Pulley Bearings — Tons	Hp. of Empty Conveyor	Hp. to Raise Live Load	Running Hp. with- out Lift	Total Running Hp.	Hp. of Electric Motor	Start Hp. Empty 15 Sec.	Start Hp. Loaded 15 Sec.	Initial Tension	Belt Tension Run- ning — Lb.	Belt Tension Start — 15 Sec. Loaded — Lb.	Estimated Travel of loaded Belt to Stop Ft.	Lineal Ft. of Belt Required — Net	No. of Carriers Re- quired	No. of Return Rollers	
1	786	43.42	37	31	68	17	11	+60	51	111	150	70	200	1,500	8,050	13,350	23	35	1,636-6	225	78
2	417	8.30	20	17	37	9	17	+12	28	40	50	39	87	2,000	4,320	7,210	35	82	867-6	120	41
3	321	4.85	17	13	30	9	5	+7	23	30	50	32	69	1,500	3,240	5,580	38	88	675-6	92	32
4	1,029	19.88	45	41	86	19	15	+27	65	92	125	87	204	1,500	6,950	13,660	35	73	2,113-6	294	102
5	1,101	21.07	47	44	91	20	16	+29	69	98	125	91	217	1,500	7,290	14,390	35	73	2,258-0	315	110
6	1,496	4.20	60	60	120	24	21	+6	91	97	150	117	234	2,000	7,740	17,100	46	156	3,047-6	428	149
7	1,402	-12.23	57	56	113	24	20	-17	114	97	150	111	245	2,000	7,800	16,610	43	349	2,858-0	401	140
8	1,500	1.47	60	60	120	25	21	+2	91	93	150	117	250	2,000	7,540	16,900	48	179	3,055-6	429	150
9	938	11.09	42	37	79	18	14	+15	59	74	100	81	176	1,500	5,840	12,000	40	102	1,931-0	268	93
10	1,410	12.33	57	57	114	23	20	+17	86	103	150	111	254	2,000	8,220	17,110	40	105	2,875-0	403	140
11	1,514	3.26	61	60	121	25	22	+5	92	97	150	120	255	2,000	7,710	17,150	47	164	3,082-0	433	150
12	1,320	29.64	54	53	107	23	19	+40	81	121	175	105	262	2,000	9,230	17,580	32	65	2,695-0	378	131
13	1,326	22.89	55	53	108	22	19	+31	81	112	175	107	254	2,000	8,690	17,110	35	77	2,707-0	380	132
14	1,342	24.42	55	54	109	22	19	+33	82	115	175	107	258	2,000	8,870	17,370	35	74	2,740-0	384	134
15	1,296	25.36	54	52	106	22	18	+35	80	115	175	104	253	2,000	8,810	17,080	34	72	2,648-0	371	129
16	1,263	27.92	53	50	103	21	18	+38	77	115	175	103	250	2,000	8,850	16,880	33	66	2,582-0	361	126
17	1,366	19.12	56	55	111	23	19	+26	84	110	175	109	255	2,000	8,540	17,200	37	87	2,788-0	391	136
18	1,301	34.04	54	52	106	22	18	+46	80	126	175	104	265	2,000	9,510	17,780	31	59	2,659-0	372	130
19	1,244	36.19	52	50	102	21	18	+49	77	126	175	101	260	2,000	9,500	17,460	30	55	2,542-0	356	124
20	558	20.20	31	34	65	10	11	+27	34	61	100	35	103	3,000	8,250	11,820	14	23	1,151-0	197	54
21 & 22	60	One 15 and one 5 hp. electric motor to each																	268-0		
Total	22,930	357.42								1,933									47,080-0	6,598	



this, mechanical belt splices would be a serious handicap, and so the question of vulcanizing them in the field was discussed with the belt manufacturers. Three of these units required over 3,000 lin.ft. of belt and the average was about 2,000 lin.ft. Due to limited headroom in the belt gallery a roll of belt more than 700 ft. long could not be handled, and most of them were nearer 500 ft. long. The entire system required a little over 47,000 ft. of belt, making over 100 splices in the entire system. A portable electric vulcanizer was developed by the Goodyear Tire & Rubber Co. for this job. The vulcanizer was purchased and contracts made with both the Goodyear and Goodrich rubber companies to make vulcanized field splices on their own belts with this equipment, leaving only one mechanical splice in each belt which it was purposed to vulcanize later after the belts had stretched.

This is one point where the calculations went astray.



#### Belt at Colonial Mine

All the belts are 48-in. wide except No. 20 which is 60 in. wide. It will be noted how the carriers are supported, so that they can be turned over on the decking while the belt is running and can be cleaned or repaired. It is remarkable how certainly the coal stays on the belt. Not a lump rolls to the floor. Its motion along the road is one of translation only. The belts carry 1,500 tons per hour at a speed of 500 ft. per minute.

Over one million tons of coal have been carried on these belts and none of them have stretched over 2 or 3 ft., which does not allow enough belt to make a vulcanized splice. In this time of operation the original mechanical splices have had to be cut out on each belt and renewed once. The vulcanizing is well justified, and preparations are now being made to vulcanize all these splices by the addition of a short piece of new belt and a double splice. In making these splices originally the ends of the belts were stepped down in the factory and vulcanized after the belts were placed on the carriers. This was a successful undertaking and has eliminated much trouble in operation.

The first power analyses, as shown by Table I, disclosed the fact that, with instantaneous starting, the power to start would be about three times that of running. As the conveyors used for these determinations were driven by direct-current motors, tests were made of delayed starts by making contacts through a barrel of water and timing the start while measuring the power. From these data it was decided to specify as long a starting duty as possible on the controls to the motors. This was worked out so as to get a 15-sec. starting duty, which reduced the starting power to about twice that for running the loaded belt. This not only aided in keeping down peaks on the power demand, but materially reduced stresses on the equipment.

The electrical control for a system of belts of this

kind required careful consideration. They must be necessarily interlocked to operate as a unit, and a certain amount of flexibility must be maintained. The control is located in the No. 1 drive room at the river. An operator is stationed at that point to control the entire system and take calls from the various patrolmen. All units are connected with this room and the office by telephone, and instructions can be issued by telephone from either the office or control room to any drive room as needed. The operator can start or stop the entire system by simply pressing a button in this room.

On one panel of the board is mounted a voltmeter which indicates at all times which belts are running and allows the operator to know at a glance where trouble is located, if any should occur to stop a conveyor. The control panels are interlocked so that by cutting out resistance at each motor room as the last accelerating contactor goes in, the reading on the volt-

meter is increased to show the conveyor in operation. When conveyors are stopped, this process is reversed.

When the belts are loaded from the dump to the river and a start is to be made, the operator simply presses the main control button and conveyor No. 1 starts, and as soon as it reaches full speed, or in about 15 sec., No. 2 automatically starts, attains full speed, and No. 3 starts, all conveyors continuing to start in the same manner until the entire system is operating. This manner of starting prevents building up a peak load, allowing the entire system to be started without any excess over the regular running load, with the exception of the extra starting load on the last conveyor.

The equipment is so interlocked that if any motor is shut down at any place in the system, every conveyor back of it is automatically stopped instantly. This stop may be caused automatically by a line contactor of any starter opening due to overload, by the breaking of a conveyor belt, or by a belt slipping on one of the driving units more than a predetermined amount. In case of power failure, all motors will stop and will not start again upon return of voltage, but the system must again be started from the main control room.

Each conveyor is provided with a limit switch operated from the idler pulley of the belt takeup, so that if the belt stretches beyond a certain point or breaks, the motor will be shut down and all motors back of it will be shut down at the same time. An emergency



switch is located in the belt gallery near each motor room, which, if opened automatically, stops all motors. All these switches must be closed before the accelerating equipment will be operative. Each starting panel is provided with a switch by which it may be disconnected from the master control system and operated as a unit if required in case of testing, splicing a belt or any other cause requiring such operation.

In making a stop these belts will naturally coast varying distances due to the difference in lengths and lifts, and while solenoid brakes are provided on each conveyor, it was not considered advisable to set them so that they would engage hard enough to bring the belts to an immediate stop. To prevent a free-running conveyor from discharging coal upon one ahead which had stopped, a mechanical interlock was installed between the head and tail pulleys of each conveyor on the system. This engages whenever the conveyor at the rear tends to run faster than the one ahead of it and prevents any piling up of coal in the chutes. As all these safeguards are working satisfactorily, we have never had any trouble with these conveyors.

#### CHUTES LOAD UNIFORMLY

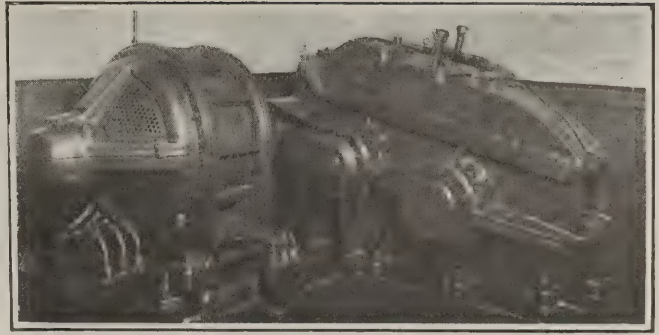
The designing of the chutes between conveyors gave much trouble as the headroom has to be kept to a minimum. The large lumps sometimes clogged the chutes a little as originally designed but this was easily corrected by cutting a V-shaped notch at the bottom. The chutes now load the conveyors uniformly throughout the entire system.

It required better than ordinary provisions to transfer this large coal tonnage from mine wagons to the conveying system. With the mine car in use, over 4,000 cars have to be dumped daily. The original scheme contemplated dumping two cars at a time with three dumps. This required large landings for empty and loaded cars and a large number of men for handling cars and dumps.

Consideration of this scheme developed a plan of consolidating this work all at one point and dumping entire trips of thirty-five cars each in a revolving dump. This scheme reduced the track for landings 18,000 lin.ft., the number of mine cars by 238, and the number of men required by eight. This scheme was adopted and the landing laid out with two 35-car rotary dumps, each 374 ft. long, set over a bin of the same length with a capacity of 1,250 tons. This gives a storage of one hour between the mine and the conveying system without tying up mine cars.

In the case of each mine, when a motorman arrives at the dump landing with a loaded trip, he cuts off at the head end, runs around the trip, pushes it on the dump where it is turned over at once, and when righted he couples to the empty cars and returns with his empty trip to the face, with a delay of only a few minutes. By this arrangement, for short periods, loaded trips up to three times the rated capacity of the conveying system can be taken care of as they come in.

The bin under the dumps will hold sixteen loaded trips, and with the conveyors running this allows a rapid handling, thus eliminating delays on the haulage system and also keeping all mine cars in motion practically all the time except when being loaded. The coal from Colonial Nos. 1 and 3 enters the dumps from one end, each normally using the dump on its own side, and No. 4 enters at the other end, using whichever dump happens to be empty when the trip arrives. Block sig-



**Double-Reduction Gear Box and Motor Set**

The driving equipment is set in rooms made in crosscuts adjacent to the conveyor, thus keeping all gears out of the main gallery. This conserves space and removes all possible operating hazards.

nals notify the motormen when each dump is clear.

One man handles both dumps and takes care of the signals. The dumps are rotated by compressed air, three 17-in. diameter cylinders being used for the over-turning and two for the reversing of each dump. Power is applied from these cylinders to the rotating cage structure through long H-beam sections and short lengths of wire rope. This eliminates the unequal stretch of long and short ropes used simultaneously.

Belt No. 20, which is 60 in. wide, extends under this hopper and is fed by thirty-four apron feeders which are all in operation at the same time and so designed as to feed a regular tonnage to the belt according to the speed at which they are set to operate. They are all driven by a single variable-speed motor, each individual feeder being driven from a line-shaft which is direct-connected to the driving motor.

Chains from this line-shaft drive worm-gear reducers which, in turn, drive each of these feeders. These multiple feeders give a very even load on the conveying system and, due to the light duty on each, should have a much longer life than could be expected where large tonnage is fed over a single feeder. In conveying 8,500 tons per day, each feeder handles only 250 tons per day.

#### DISCHARGES AT RIVER TIPPLE

At the river or discharge end of this conveying system, a large river tippie was built. The coal when discharged from No. 1 belt passes over a long bar screen with bars spaced to pass coal of a desired size. All small coal is collected in a chute which feeds a shuttle conveyor distributing it uniformly over the entire length of a slack-coal bunker.

The coal passing over this screen is fed to a duplicate shuttle conveyor which distributes it over the lump-coal bunker. These shuttle conveyors are either manually or automatically operated, as desired, and so interlocked with the main system as to start always with the other belts, thus preventing any flooding of coal at the start. Each has a capacity of 1,000 tons per hour, allowing for variations in the quantity of slack in the coal such as at times will occur.

The bunkers are of the suspended type, being suspended over the river from heavy girders resting upon six large concrete piers. Each of these bunkers has a capacity of about 1,200 tons. Coal is taken from the bottom of the bunkers through eight gates spaced so as to feed coal uniformly to a barge 175 ft. long. This allows each barge to be completely loaded without moving. A barge of 850 tons capacity can easily be loaded in ten minutes. The chutes leading from the gates to



the barge are arranged to telescope to allow for varying heights of water in the river.

The gates and telescoping chutes are all operated by electric motors which are centrally controlled in a cabin located beneath the bin where the operative has a clear view of all operations. The gates are opened by torque motors which hold them open as long as the electric current is kept on them. They are counter-weighted so as to close automatically as soon as the current is cut off. Thus in case of power failure the gates immediately close. The operator can open or close all gates at once, or any individual gate or number of gates by simply pressing the proper buttons on his board. A small barge-mover for handling both empty and loaded barges is also operated from this same board. A large reinforced concrete ice-breaker protects this harbor in which space is provided for storing ten empty and ten loaded barges.

#### CONVEYED 9,426 TONS IN ONE DAY

With this general description of the conveying system and its feeding and unloading arrangements, let us look at it briefly from the operating standpoint. It was started in regular operation April 12, 1924 and up to the present time has carried a little over one million tons of coal. The largest day's production up to Nov. 15 was 9,426 tons. The production during the month of October indicates that by this equipment it will be possible to obtain the production contemplated. The power requirements for the month were 0.363 kw. per 100 tons per 100 ft. level or equivalent.

The total power used for operating the conveying system, pumps, fan, and charging storage-battery motors, including transformers and line losses was 338,000 kw.-hr., of which 250,000 kw.-hr. were required for the conveying system.

In the months of August and September power tests were run on all these conveyor units. Each test was for an entire day, and accurate power readings were taken, the time the belt operated loaded and empty and the tonnage handled were recorded. The data shown by Table III is the result of this series of tests. At the time they were made the tonnage was less than is now being carried, but the results should be fairly representative of the power consumption.

From this data a formula has been prepared for cal-

culating the horsepower required to drive conveyors completely equipped with anti-friction bearings of the class being used. This formula applies only to 48-in. belt conveyors of long centers. It is divided into three parts, the power to drive a belt conveyor empty, plus the power to carry a given tonnage a horizontal distance, plus the power to lift this tonnage a given height.

The first part, or empty-belt power, is one of friction, both rolling and bearing, and is not exactly proportioned to length because the loads and belt stresses carried by main bearings are practically constant regardless of length, whereas the carrier rims and belt weight are directly proportional to length. We find from these tests that lift has practically no influence on the power used by a belt conveyor running empty. On conveyors such as are used in this system, the lengths and conditions are so nearly constant that the power per 100 ft. of conveyor is almost uniform, and in this formula we have taken the constant  $K$  which represents the power per 100 ft. of conveyor directly from the data as tabulated. This constant presupposes that all parts of the equipment are in first-class condition.

Its average value on all conveyors in the system having tandem drives is 2.11 kw. or about 2.5 hp. For safely estimating power the value recommended is  $K = 2.8$  when figuring the horsepower of conveyors of this class. The power for an empty conveyor where  $K =$  constant representing conditions and class of equipment, and  $L =$  length of conveyor in feet between centers of head and tail pulleys is given by:

$$\text{Empty Power} = \frac{KL}{100}$$

The second portion of this formula represents the resistance of the live load added to the empty belt which is simply bearing friction and rolling friction of this additional load on the carriers. This portion of the power is directly proportional to the length of conveyor and the tonnage carried and can be expressed as follows:

$$\text{Power for Live Load} = \frac{CTL}{100 \times 100}$$

Where  $C =$  constant power required to carry 100 tons 100 ft.;  $T =$  tons per hour and  $L =$  length of conveyor in feet.

The last portion of the power takes into considera-

Table III—Data Regarding Belt Tests at Colonial Mines

Belt No.	Length in Ft.	Lift Ft.	Tons Carried Day of Test	Total Kw.-Hr. for Day	Time That Belt Ran, Min.	Time That Belt Load, Min.	Average Load Tons per hour	Kw. Demand for Empty Belt	Added Kw. Above Empty Demand to Carry Average Load	Kw. to Lift Load Average	Constant Kw. per 100 Tons per 100 Ft. †			
											Level Belt *		Hill	
											Kw.	Hp.	Kw.	Hp.
1	786	43.4	6,346	460	368	352	1,080	19.2	51.6	39.8	11.8	14.2	0.139	0.167
2	417	8.3	6,418	174	360	327	1,180	12.8	14.1	8.3	5.8	7.0	0.118	0.142
3	321	4.8	6,460	144	350	326	1,192	12.8	9.3	4.9	4.4	5.3	0.115	0.138
4	1,028	19.9	6,500	410	395	350	1,115	24.0	35.0	18.9	16.1	19.3	0.140	0.168
5	1,100	21.1	6,854	420	390	333	1,235	27.0	36.7	22.2	14.5	17.5	0.105	0.128
6	1,496	4.2	7,122	410	370	350	1,222	31.1	29.0	4.4	24.6	29.5	0.134	0.178
7	1,402	-12.2	6,884	330	395	389	1,060	28.8	17.5	-11.0	28.5	35.2	0.192	0.230
8	1,499	1.5	6,750	400	415	361	1,120	28.8	27.9	1.4	26.5	31.8	0.158	0.189
9	939	11.1	7,032	358	376	361	1,142	25.6	26.0	10.8	15.2	18.2	0.142	0.170
10	1,410	12.3	7,883	440	389	354	1,336	24.0	37.0	14.0	23.0	27.6	0.122	0.147
11	1,513	3.2	7,250	400	388	359	1,212	28.8	30.2	3.3	26.9	32.2	0.146	0.176
12	1,321	29.6	7,271	530	375	340	1,282	32.0	52.0	32.3	19.7	23.6	0.116	0.139
13	1,325	22.9	7,252	480	374	342	1,272	26.5	47.2	24.8	22.4	26.9	0.132	0.159
14	1,342	24.4	7,085	490	377	345	1,232	26.0	49.0	25.6	23.4	28.0	0.141	0.169
15	1,296	25.4	7,341	500	367	334	1,320	24.0	49.9	28.5	21.4	25.7	0.125	0.150
16	1,263	27.9	7,939	430	400	350	1,362	26.4	50.1	32.3	17.8	21.4	0.103	0.124
17	1,366	19.1	6,225	440	355	340	1,100	26.0	42.0	17.9	24.1	28.9	0.160	0.192
18	1,301	34.0	7,235	520	370	363	1,196	24.0	53.3	34.6	18.7	22.5	0.120	0.144
19	1,243	36.0	7,847	650	375	353	1,334	28.8	71.7	40.8	30.9	37.1	0.186	0.225
20	558	20.7	7,421	307	440	283	1,575	12.8	48.7	27.8	20.9	25.1	0.238	0.285

\* Demand measured as additional power above empty demand. Difference between preceding columns. † Based on two preceding columns.



tion the direct work of raising this load a given height with an allowance for electrical and mechanical efficiency. This can be expressed as follows where  $H$  = height of lift in feet;  $D$  = constant due to efficiency:

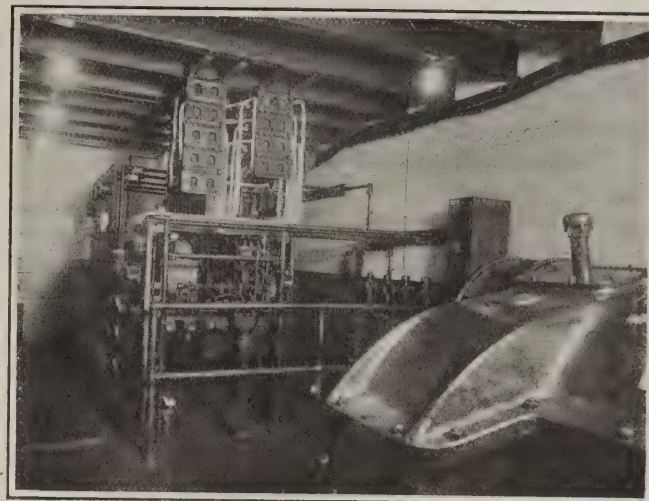
$$\text{Power for Lift} = \frac{DTH}{1,000}$$

Assembling these various components we have for driving conveyors of long centers with tandem drives with all bearings of high class anti-friction type:

$$\text{HP.} = \frac{KL}{100} + \frac{CTL}{10,000} + \frac{DTH}{1,000}$$

For conveyors of this class the value of the constants for figuring horsepower of conveyors is as follows:  $K = 2.8$ ;  $C = 0.18$  and  $D = 1.12$ . This gives safe data for estimating power requirements on conveyors of this class.

Summarizing, it has been found that a conveyor is dependable in its operation; positive in its performance; durable to an extent greater than most machines; less hazardous to life, and not entirely dependent upon the human element. It requires few men to operate; is not excessive in first cost, and has low operating charges.



Typical Inside Switchboard and Starting Panel

To the right in the foreground is the speed-reduction gear. There are three incoming lines on the system any two of which could furnish the whole installation. All motors are 2,300 volt, 3-phase, 60-cycle, 900 r.p.m. and of wound-rotor type. The entire system is controlled from No. 1 motor room.

## Nunnery Mine Accident May Lead to New Laws Relative to Inclines

Seven persons were killed, fifty-five were injured, eight seriously, when a rope on a 1-in-9 incline broke, Dec. 3, 1923, at the Nunnery Colliery near Sheffield, England. A report on the accident recently has been made by Sir Thomas H. Mottram, chief inspector of mines.

The rope was used for bringing coal cars out of the mines, returning them empty, hauling men from the mines and lowering them into the workings. The haulage rope passes to the surface through 4-in. cast-iron pipes which run down the brickwork lining of the shaft. A rope passed from the front car over the top of the trip to the back car to connect the wagons in case any of the couplings broke, and in hauling the cars up the incline a drag was put on the last car. An "authorized person" rode on the trip whenever persons were being hoisted or lowered. No one was allowed on a trip in which coal was being hauled.

On the day of the accident, the set of forty-four wagons of which forty-two were for riding purposes, known as the "Paddy Mail," were attached to the rope, and some 120 persons entered the cars to ride down the incline. The "authorized person," Colin Chappell, passed his knife eight times over the two signal wires to show that the men were in the cars and then four times to order the enginemen (there were two when men were being transported) to lower them slowly. They were usually lowered at a speed of only three miles an hour. For about 40 yd. they proceeded at that speed, but at the end of that distance they began to travel much faster. Chappell gave the four-ring signal again, but the enginemen interpreted it as one ring which required him to stop the trip and this he did. But he had barely done so when the rope parted and the man trip plunged down the incline and left the track at Cain's junction, 377 ft. below the starting place.

When hauling coal only 34 to 36 cars were used, and the average load was 28½ to 30½ tons. When hauling men the car at each end was filled with scrap iron to stabilize the trip, but the dead weight on the rope was only 19 tons. Nevertheless the rope broke, showing

that having pulled a larger load just prior to the lighter man-trip did not insure the men against an accident. The factor of safety with the new rope when lowering coal was 10.3; when raising coal 6.3; when lowering the men it was 14.8 and when raising them 9.0. Tests on the old rope that had been 19½ months in service showed that when lowering coal the safety factor was 5.9; when raising 3.6 and when lowering men it was 8.5 and in raising them 5.2. Other ropes had lasted two years.

Whenever a new length was added to the rope a corresponding length was cut from the capel end. By this process the oldest part of the rope was between the capel and the first splice. It was here the rope broke at a point 70 yd. from that splice and 230 yd. from the capel. The rope had been inspected 2½ hr. before the accident. An inspection seemed to indicate that eight interior wires in three adjacent strands had broken prior to the accident suggesting that the rope had been injured. Only two interior wires had corroded. There was a slight rust throughout but "no excess of corrosion." At the point of fracture the rope had been reduced about 40 per cent in effective area. The cable had been tarred weekly, had received a thorough weekly examination and was inspected daily to detect broken wires, a workman allowing it to run through his hand, a piece of hemp bagging or cotton waste being used to protect the hand from injury. The rope was recapped once a month.

It was shown that, when examinations were made and two or three broken wires were found in one strand, no report was made of the injury to the rope, but a splice of new rope was inserted. No report was made or action taken where only a single wire was broken. The chief inspector said that this practice might have kept the management from learning of the gradual deterioration of the rope, and stated that reports of this character should be made. He declared also that ropes used for the haulage of persons on inclined planes should not be spliced and that such ropes should not be used over eighteen months. He urged that an effective safety device to arrest cars, should the rope break, be placed on every man trip on an inclined plane and that the provision of a separate road for the haulage of men should receive the attention of mine managers.



## Steel-Plant Men Find Welding Has Wide Application

Thermit Welds Supplementing Arc and Gas Welds—  
Can Use Manganese Oxide to Harden Outer  
Surface—A 6,500-Lb. Weld

IF COAL-MINE mechanical and electrical men had attended the monthly meeting of the Association of Iron & Steel Electrical Engineers at the William Penn Hotel, Pittsburgh, Pa., on Dec. 13, they would have learned to what a large extent the various methods of welding are being utilized by the iron-and-steel industry to salvage broken and worn parts of electrical and mechanical machines. This meeting of the association was confined to illustrated descriptions of, and the technique entering into, scores of welding jobs which have been done successfully at the iron-and-steel plants in and about Pittsburgh. As W. L. Warner, of the General Electric Co., put it, "Welding equipment is the iron worker's needle and thread." Judging from what was said at this meeting, the steel plants make wider use of welding equipment than the coal mines.

Three processes of welding are in common use in the steel plants. Two of them, arc welding and oxy-acetylene or gas welding, are widely employed at our coal mines and need no further explanation. The third process, however, is seldom, if at all, used at the mines and should have applications similar to, and also different from, those covered by the arc-welding and gas-welding processes. The process in mind is "thermit welding." The term "thermit" is applied to a mixture of powdered aluminum and iron oxide.

Aluminum has a great affinity for oxygen. Consequently when it is mixed with an oxide of iron in a crucible and ignited by an agent such as a burning piece of magnesium ribbon, a chemical reaction takes place. The iron oxide is reduced to iron and the aluminum combines with the oxygen set free from the former and forms aluminum oxide. This reaction is exothermic and produces a temperature of about 5,000 deg. F. Consequently the iron and aluminum oxide are melted down during the change.

### CAN INCREASE TENSILE STRENGTH

These two products, not being miscible, separate into two layers. As the specific gravity of the molten iron is greater than that of the aluminum oxide, when the contents of the crucible are poured into a mold, the aluminum oxide rises to the top and does not form a part of the welded joint. The tensile strength of the iron in the joint thus formed is equivalent to that of iron laid by any other welding process. By the addition of oxides of alloy metals to the mixture the tensile strength of a welded joint can be substantially increased, and the composition of the welding material may be made similar to the metal being welded. Ten to twelve per cent of manganese oxide may be added to the thermit and it will form a hard outer surface on the welded area.

The thermit process may be used successfully for steel, wrought iron and cast iron. The procedure for each is about the same except that more care must be exercised so as not to overheat the cast iron while it is being welded.

H. D. Kelley, district manager of the Metal & Thermit Corp., Pittsburgh, Pa., described the uses of thermit

welding in the iron-and-steel industry for the reclaiming of broken and worn parts of machinery. The largest welding job ever made to his knowledge was the repair of a shear in a blooming mill of the Pittsburgh Steel Co. The break was so large that 6,500 lb. of thermit were required to effect the weld. He briefly described another interesting job: At one of the blooming mills of the Carnegie Steel Co. a broken crankshaft, of 27-in. diameter was reclaimed by thermit welding. In this job a new end was added to the shaft.

Mr. Candy, of the Westinghouse Electric & Manufacturing Co. and W. L. Warener, of the General Electric Co., described many steel-mill repair jobs in which the electric arc welder played the most important role. Don McCloud, consulting engineer of Chicago, described the manufacture of oxygen by the liquefaction method. Incidentally he mentioned the welding by oxyacetylene, in an oxygen plant, of a  $\frac{3}{4}$ -in. seamless tube pipe line which withstands a pressure of 3,000 lb. per sq.in. Mr. Applegate described the oxyacetylene welding of a 28-in. exhaust-steam line at one of the mills. He said the welding of joints eliminated rivets and rivet friction and allowed the use of a pipe line of smaller diameter.

### WELDING FOR MINE REPAIR JOBS

A list of a few of the many repair jobs that are made in steel mills by welding should convince our mine repair men of the value of welding. These are set down without further explanation, as follows: Shafts of all sizes and of various designs, including armature shafts; frames and housings on large and small machines; flywheel spokes; racks; gears and pinions—helical and spur—; hydraulic cylinders; pipe joints; locomotive frames; switch points, track frogs and crossovers; connecting rods; locomotive-wheel flanges; boiler flues and tanks of all kinds.

The meeting brought out the following facts that should be helpful to the repair men at the mines: Thermit mixture, the material used in thermit welding may be so composed that the product of chemical reaction in a weld joint is a metal which closely resembles the metal of the parts that are joined. Manganese oxide may be used in the thermit crucible or sprinkled on an area being arc-welded to produce a hard wearing surface, a suggestion particularly valuable to mining men who desire to build up worn switch points, frogs and crossovers. The addition of granular nickel to a weld may add as much as 5,000 lb. per sq.in. to its tensile strength. There is no practical limit to the application of welding methods. Its practicability extends from  $\frac{1}{8}$ -in. sheet steel to huge shafts and frames, for if a welded joint holds on a small job it should hold on a large one. Broken taps may be welded together allowed to cool and then backed out from the holes that are being threaded thereby saving much time. Extensive fractures in locomotive frames may be repaired by cutting out a section and joining the two ends by layers of steel plates welded together. Worn armature shafts can be built up without having to tear down the armature itself. Steel structural members in buildings are often joined by being welded instead of by riveting. This suggests a practice that might be followed in the erection or repair of tipples and other structures subject to vibration. A good welding job will generally give as long a life to a broken part as that possessed by a duplicate new part.



# West Virginia-Kentucky Electrical Men Present Their Problems and Experiences

Floating Battery Irons Out Frequently Recurring Peak—Such Accumulators Have Long Life—  
Use of Storage Batteries as Auxiliaries—How to Convert the Mine Foreman—  
Rotary Converter Versus Motor-Generator Set

BY A STAFF CORRESPONDENT

**S**PIRITED discussion characterized the fourth annual convention of the West Virginia-Kentucky Association of Mine, Mechanical and Electrical Engineers, held at Huntington, W. Va., Dec. 12 and 13. No exhibit was held in connection with this year's meeting but nevertheless there was a sufficient attendance at all sessions to make the convention a success.

In opening, R. R. Webster, of Weeksbury, Ky., who is president of the association, called attention to the unfortunate fact that at no time is it more difficult for men to get away to attend meetings than just when the mines most need to reduce the cost of production by improved and more efficient methods, and therefore when a getting together of the electricians and mechanics to iron out difficulties is most desirable they are either too busy to come or the company hesitates at the small expense that their attendance would incur.

The paper prepared by Byron B. Minnium, on voltage control in mines by storage batteries evoked an interest which was evidenced by lengthy discussion. Mr. Kennedy, of the Electric Storage Battery Co., described two installations in Illinois mines. In one of these instances batteries have been used for three years to help handle the peak load caused by a main haulage locomotive pulling a trip up a short 4-per cent grade which is about 5,000 ft. from the shaft. For this purpose several old batteries, which have already served their best days in mine locomotives, are connected so as to float on the line taking charging current only when the load is light and delivering high current back to the line when the demand is heavy. The installation of this battery in the mine, near the point of heavy grade, raised the minimum voltage delivered to the 13-ton locomotive from 75 volts to 175 volts.

The other use of batteries which he described was at a mine which was shut down for a long period. This operation has its own power plant and is equipped with battery locomotives for gathering. By using the locomotive batteries to operate the fan and pumps it was necessary to operate the power plant but one day per week. On this day the batteries were charged and any necessary heavy work done, such as using locomotives for the general upkeep of the mine. The batteries had to be charged and care had to be given them regardless of use, so that the arrangement described did not incur any additional labor.

In regard to the life of a battery floating on the line, J. H. Markham, of Ronda, W. Va., called attention to the fact that batteries thus used should have a longer life than if incorporated in the frame of a mine locomotive. The floating battery being at a state of full charge most of the time, the tendency to sulphation and other deterioration of the plates would be reduced.

Replying to questions regarding the efficiency of a floating battery, and as to the highest discharge rates possible for short periods, Mr. Kennedy replied that a 92-per cent ampere-hour efficiency has been obtained in such service, and that discharge rates of 10 or 12 times normal rate are quite practicable.

E. W. Pardee, of Charleston, W. Va., inquired whether in any instances batteries are being used as auxiliary power sources for the operation of mine fans. Mr. Caverlee said that a 130-cell, 23-plate battery, after having been used at an Ohio mine as an auxiliary on a fan for over four years, was examined and found to have deteriorated but little during this long period of use.

A. F. Brosky, of Pittsburgh, described an installation in the Fairmont field where a cable was run through a borehole from the fan to the underground motor barn. In case of power failure a battery locomotive is ordered into the barn and connected, through the cable, so as to furnish power for the fan motor.

An important emergency use for which a locomotive battery should be kept in mind was described by Mr. Webster, this for excitation in a mine power plant where alternating-current generators are used. In getting generators back on the line after a shutdown, temporary operation of the steam-driven exciter is necessary. If at this time the exciter should break down, then a 40- to 60-cell locomotive battery can be used temporarily to furnish generator field until the motor-driven exciter is started.

At this point the discussion digressed to the subject of electrification of gaseous mines by storage batteries. The recent paper on this subject read at the West Virginia Mining Institute by John B. Hicks of the Consolidation Coal Co., formed the basis of this discussion. Using a large battery mounted on a truck and assigned to a mining machine for furnishing power for cutting is the radical departure which is attracting attention. The more important advantages, aside from the primary feature of being able to use electricity



with greater safety in a gaseous mine, were recounted; these being, increased speed of cutting because of improved and constant voltage, elimination of delays caused by power interruptions, elimination of bonding expense, elimination of trolley wires, and reductions of peak loads which under certain rate schedules effects a large saving in the demand portion of the power bill.

W. H. Miller, Jr., called attention to the large investment in batteries which is necessary when power is to be furnished for cutting, gathering and hauling, and to the fact that in from three to five years the batteries will be worn out and the investment must be duplicated.

F. A. Signer, who was to have given a talk at the meeting on the methods of the electrical department of the Southern Mining Co., found at the last moment that he would be unable to attend, so he sent a message requesting the chairman to ask J. H. Edwards, who is familiar to a certain extent with their methods, to describe these in a general way. The Southern and associated companies hold, about twice a year, a meeting of their chief electricians. As many as possible of the mine foremen and superintendents also attend. The electrical department costs of each mine are reviewed and discussed. Each chief electrician is asked for a report covering his success or troubles with the different kinds of equipment in use at the mines, and concerning plans he has to propose for lowering the costs of electrical operation. Naturally many matters are discussed which concern the foremen and superintendents, hence the advantage of their being in attendance.

The foregoing account of the Southern Mining Co.'s methods was followed by a general discussion of the ways of obtaining closer co-operation between the mine foremen and electricians. R. R. Webster called attention to the fact that many mine foremen seem to forget that abuse of equipment and the resulting repairs add to the cost of coal at the mine and so reflect unfavorably on their management of the company's property. The days of "production regardless" seem to be over; this is a time of lower cost per ton.

The idea was advanced by F. M. Reigher, of Bluefield, that the mine electrician himself is to blame for much of the lack of co-operation of which he so often complains. The mine electrician needs to exercise more patience and perserverance. W. H. Milton, Jr., said that a large anthracite mining company has found that the holding of regular, combined meetings of electricians and mine foremen is the best way of impressing upon foremen the necessity for using more consideration in the operation of equipment.

Reducing costs by proper supervision of mechanical and electrical equipment was the subject of a paper read by J. H. Edwards. This was illustrated by exhibits and punctuated by citations of actual instances where electrical men effected appreciable savings in

production cost and of other instances where an opportunity to make a saving was not recognized until too late. J. H. Markham stated that, as a rule, the mine electrician is kept with his "face so close to the grindstone" that he cannot see and remedy many of the important opportunities that are within his grasp. A. F. Brosky recalled that the large steel companies found long ago that they can afford to spend more for inspection and engineering supervision of equipment than for actual repairing.

The importance of keeping in stock small inexpensive repair parts, which are difficult to obtain on short notice, was discussed by T. A. Martin, of the Peerless Coal & Coke Co., Vivian, W. Va. He cited a large coal company which, in order to facilitate ordering repairs, obtained from the equipment manufacturer duplicate name plates for each item of equipment, and filed these plates in the engineering office for reference. In regard to pump installations, Mr. Martin stated that slate falls on the pipe line close to a pump frequently broke the water-

end casting, so the Peerless company is now using a short length of hose adjacent to the pump, in both the suction and discharge lines.

H. H. Fletcher, manager of the Quincy Coal Co., Quincy, W. Va., said that he thought the greatest opportunity to make a saving in maintenance expense exists in periodic inspection and prompt repair of all the small items. He favors the purchase of insurance against electrical breakdowns. This causes more thorough inspection, and assures the company that faults when reported

will be repaired promptly in order to avoid paying a penalty in the form of a higher premium.

The ordering of repair parts as soon as the need can be foreseen was urged by Mr. Pardee. Waiting until the last moment and then ordering an express shipment by telegram is expensive. An actual case was described where a new set of tires for a locomotive were ordered from the factory by express. These were needed to replace worn tires, and the need could have been anticipated a month, or perhaps, several months.

E. L. Hough of the General Electric Co. gave a short talk on automatic substations. This was followed by the showing of a new film illustrating installations in coal and salt mines. The step-by-step operation of the relays and automatic contactors was shown in detail. R. R. Webster inquired if satisfactory apparatus is available for the automatic paralleling of two machines located in the same substation. To this Mr. Hough replied that there is little difficulty in paralleling converters, but much difficulty in paralleling motor-generators which are over-compounded. The difficulty arises when a cold machine is added. As it warms up, the percentage of load which it carries will change materially unless the field rheostat is adjusted. A current balance regulator is now available which does this automatically.

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**S**TORAGE batteries have many other uses besides those of driving gathering locomotives. Their ability to help in meeting mine problems seems now to be receiving unusual attention as was evidenced by the discussion at the meeting of the West Virginia-Kentucky Mine, Mechanical and Electrical Engineers. As usual the inability of the mine foreman to visualize the importance of the careful use of electrical equipment was a subject of extensive comment. Nothing or little was said apparently about ineffective bonding. Is it to be concluded that this defect has been largely removed in the states principally represented? If so the companies whose electrical men were present are to be congratulated and their electrical experts to be commended. Would it were so everywhere!

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F. M. Reigher stated that he had overcome the trouble of paralleling motor-generators, by using machines which are designed for flat compounding. He followed this discussion by reading an instructive paper in which the rotary converter was compared with the motor-generator. He carefully analyzed the characteristics of each and compared the costs of manual and automatic types. He stated that the overall efficiency of a converter installation is from 5 to 8 per cent higher than that of the motor generator. Except for the one big feature of power-factor correction, the converter seemed to get the best of the argument in the lively discussion which followed Mr. Reigher's paper.

Roscoe Woltz called attention to two advantages of the converter which were not mentioned. The pull-out torque is about 4 times the rated load, as compared to about  $2\frac{1}{2}$  times for a motor-generator. Also in case of the failure of a bearing, a replacement is readily made on a converter, but may be complicated on a motor-generator, because in a three or more bearing outfit the question of shaft alignment must be considered.

J. H. Edwards called attention to the necessity for an automatic field regulator on synchronous sets to maintain a desired power factor. Mr. Hough stated that two such automatic regulators are now in use at Pennsylvania mines.

Following the discussion of Mr. Reigher's paper, the subject of electric welding for shop repairs was considered. Mr. Webster described a number of useful applications and reviewed a year's experience in filling worn locomotive tires. His conclusion, based on his experience to date, is that welding tires does pay, but that the margin of saving is small, therefore the most economical methods must be used. He uses a  $\frac{1}{4}$ -in. diameter Wanamaker manganese-steel electrode, and grinds the filled-in surface by a home-made device which requires little attention.

Answering a question by Mr. Fletcher, as to the direction in which the layer of metal is laid, Mr. Webster stated that the beads are applied crosswise to the length of the tread. Mr. Markham said that

his experience indicated that in a plain sleeve bearing a built-up shaft seemed to wear just as little as, if not less than, the original material.

The discussion of correct methods of installing feeders in boreholes was opened by the reading of a paper written by E. S. Simpkins, of Pittsburgh, representing the Standard Underground Cable Co. He described their lead-covered, steel-wire-armored cable and the method of supporting it at the top of a borehole by a long clamp around the armor. For a cheaper installation a varnished cambric two- or three-braid weather-proof cable is recommended. He also advocated that it be supported by carrying it over a sheave of large diameter, or in case of high voltage that each conductor be tied to a separate strain insulator.

W. H. Milton, Jr., told how, in lowering jute-covered cables into deep boreholes trouble is encountered because the jute covering is pulled off by the impregnating compound causing the turns on the reel to stick together due to the weight and tension. This is overcome by ordering the cable without any compound in the jute covering, and then applying the compound to the cable, a few feet at a time, as it is lowered into the borehole.

The meeting was closed by a discussion of the correct application of carbon brushes. H. C. Harker, of Huntington, representing the National Carbon Co., stated that abrasives are undesirable in brushes, however if the mica is not under-cut, a degree of abrasiveness is necessary. He described the arc type of slotting for commutators. With this type of slotting less dirt collects than with any other, but it requires special tools. Mention was made of experiments which are being made of using a varnish in the slots after cutting. It is believed that this will prevent oil or moisture from damaging the mica.

Mr. Webster condemned the deep, square-bottom slots cut by some manufacturers in their commutators. In the duty encountered in a mine, such commutator slotting often causes trouble due to the arcing in the bottom of the slot, which is a result of an accumulation of dirt, oil and moisture. H. H. Fletcher said that, in his opinion, there are no instances around the mines where proper slotting is not advisable.



#### Orkney-Warwick Mine

This mine is located at Hemphill, McDowell County, West Virginia, about two miles from the business section of Welch in a westerly direction. It is one of nine operations of the Kingston-Pocahontas Coal Co., formerly the Solvay Collieries Co., a subsidiary of the Semet-Solvay Co., of Syracuse, N. Y. The coal is shipped over the Norfolk & Western R.R.





## News Of the Industry



### Green Named as President Of Federation of Labor; To Follow Gompers' Policy

William Green, secretary and treasurer of the United Mine Workers of America, was chosen on Dec. 19 to be president of the American Federation of Labor to succeed the late Samuel Gompers. Soon after his election Mr. Green announced that it would be his purpose to adhere to those principles of trade unionism so ably championed by Mr. Gompers and upon which the superstructure of organized labor rests.

Mr. Green's election took place at a meeting of the executive council of the Federation, held in New York City, and was unanimous. At the same time James P. Noonan, of the International Association of Electrical Workers, was elected eighth vice-president.

The new president of the Federation is 51 years old and lives at Coshocton, Ohio. He has been identified with labor organizations for many years and served at one time as president of the Ohio organization of the United Mine Workers. He has been secretary of the International organization since 1912, when he was appointed by John P. White to fill an unexpired term as secretary.

#### Feels Solemn Duty to Serve

Following his election Mr. Green said that he regarded it as a call to service, "and for that reason I feel it my solemn duty to accept and to serve."

Continuing, Mr. Green said that "the high standard of excellency in service, efficiency in leadership and administrative ability attained by Mr. Gompers during his long and useful career is a challenge to the best and highest of everything which any human being can give in the service of his fellow man."

"While organized labor feels most keenly the loss of the great leader, Mr. Gompers, every member may take courage and consolation from the fact that he left us a legacy of incomprehensible value. We have his trade union creed, his trade union philosophy, his writings, letters and recorded spoken words. All of this will serve as a guide in charting and shaping our course and in the formulation of our policies."

"In co-operation with my colleagues on the Executive Council of the American Federation of Labor and the chosen officers of all affiliated organizations we will carry forward the work of organization and education among the workers of our land."

"We will endeavor to promote collective bargaining, the observance of wage agreements and the acceptance of the organized labor movement by all classes of people as a logical, necessary moral force in the economic, industrial and social life of our nation."

"While striving for the attainment of these praiseworthy purposes we



William Green

Secretary and treasurer of the United Mine Workers of America, who has been chosen to succeed the late Samuel Gompers as president of the American Federation of Labor.

shall ever be mindful of our duties and obligations as American citizens. Our devotion to America and American institutions must never be successfully challenged. Our demand upon society for higher standards of life, better wages, independence and humane conditions of employment must ever be based upon our inalienable right to the enjoyment of life, liberty and the pursuit of happiness.

"Our problems must be met and solved upon the basis of American fair play and in accordance with American traditions and American ideals."

#### Wise Choice, Says Lewis

Later in the day John L. Lewis, president of the miners' union, who came to New York to attend the funeral of Mr. Gompers, issued a statement regarding Mr. Green's election in which he said:

"The election of William Green as president of the American Federation of Labor is the choice of wisdom. Mr. Green's long experience in the trade union movement, his undoubted talent

#### Hard On Hootch

Employees of the Colorado Fuel & Iron Co., which operates a steel mill at Pueblo, Colo., and 26 mines in various parts of the state, will be watching their steps hereafter. Those with thirsts or the where-withal to satisfy the thirsts of others will be especially watchful. The company has posted a notice warning that any employee caught buying or selling "moonshine" will be suspended from the payroll for the first offense and summarily discharged for any repetition, without waiting for a court verdict. The popularity of the Colorado Fuel & Iron Co. among "drys" has risen 8,000 per cent. Prohibition enthusiasts are writing letters to the newspapers about it, saying that if every employer in the country followed this company's example the Volstead law would be enforced.

for leadership and his prestige as a public spirited citizen are qualifications which insure the success of his administration. He is the one outstanding figure who can take upon himself the mantle of the revered Gompers and be assured of the co-operation and devotion of the great majority of the membership of the American Federation of Labor.

"His ascendancy to the position of president marks the beginning of a new era of constructive progress in the ranks of labor and his election will allay any public apprehension that the long established and proper policies of organized labor were to be seriously impaired."

"Mr. Green will enter upon his new duties under conditions which augur well for the future of organized labor and the proper protection of the public interest."

#### Green to Make Few Changes

Mr. Lewis announced that he will soon appoint a successor to Mr. Green as secretary and treasurer of the miners' organization. Mr. Lewis was a candidate for president of the Federation against Mr. Gompers in 1920.

Mr. Green said he intends making few changes in the personnel of the national headquarters staff. He will preside for the first time over the Executive Council at its meeting to be held in February at Miami, Fla.

Following the election of Mr. Green, James Duncan, who for thirty years has been a vice-president of the Federation, tendered his resignation. The resignation was tabled until the meeting at Miami.



## Connellsville Independents Return to 1920 Scale; to Fire 2,500 Ovens

A number of independent coal and coke operators in the Connellsville (Pa.) region on Dec. 15 announced a return to the wage scale of Sept. 1, 1920, the peak scale of the region. Some made the change effective immediately, the others making Jan. 1 the date for putting it into effect. It is probable that others will take similar action around the first of the year. Under the new scale, drivers in shaft mines, track layers and timbermen get \$7.55 a day and assistants \$6.55, with other mine work in accordance.

On the heels of this announcement came orders to fire up immediately 2,438 more ovens in the Uniontown district, giving 3,000 men employment.

Companies that made the new scale effective last week include W. J. Rainey, Inc., Hillman Coal & Coke Co., Connellsville Central Coal & Coke Co., Monessen Coal & Coke Co., Reliance Coke Co., Fayette Coke Co., Puritan Coke Co., Eastern Coke Co., Orient Coal & Coke Co., Republic Iron & Steel Co., Oliver-

Snyder Steel Co. and the Buckeye Coal Co. The Jan. 1 list includes the Snowdon Coke Co. and the Century Coke Co.

The Bourne-Fuller Coke Co., near Searight, was the last to cut wages and the first to go back to the 1920 scale.

The H. C. Frick Coke Co. has issued orders to fire the following ovens immediately: Leith, 300; Brownfield, 200; Dearth, 300; Leisenring No. 1, 500, and Youngstown, 250. W. J. Rainey, Inc., gave directions for immediate resumption at these plants: Allison, 493; Revere, 206, and Mount Braddock, 135.

On Dec. 12 the men at the Republic Mine of the Republic Iron & Steel Co. struck, demanding restoration of the Frick scale (the peak wage). The company thereupon closed the mine indefinitely and resumed operation at its Russellton No. 1 mine, in the Freeport field. The Hillman Coal & Coke Co. has resumed at the Pike Mine, a union operation at Brownsville, on the edge of the union field.

## Engineers to Co-operate in Reforestation Program

Studies of the forestry situation in the various states are to be made by national and local engineering societies under the direction of the American Engineering Council, which announces its purpose of working with the federal government to carry out the provisions of the Clarke-McNary Act.

The nation's timber resources are thinning so rapidly as to constitute a grave social and industrial menace, according to the Council. At a forum in Washington, D. C., Jan. 16-17, to be attended by delegates from all over the country, plans for nation-wide reforestation effort will be publicly discussed.

The Council has appointed a Committee on Reforestation, which has already begun the work of enlisting engineers in every state in a permanent organization whose investigations shall harmonize with the government's policy, according to the president of the Council, Ex-Governor James Hartness, of Vermont.

A survey has disclosed that fourteen states are without forest departments. The most heavily timbered of these are Florida, South Carolina, Georgia, Mississippi and Arkansas. Summarizing what is being done by the several states, a statement by the Council says:

"In November citizens of California will vote on a constitutional amendment placing immature forest growth on the tax exempt list for four years after planting.

"Wisconsin will vote on an amendment which provides for the participation of the state in acquiring, preserving and developing forests and for appropriating funds for this purpose within certain limits.

"In South Carolina a committee representing lumbering, agriculture and other industries is fostering the introduction of a bill providing for a state forestry department.

"Pennsylvania will vote in November upon the issuance of \$25,000,000 in bonds to be used for the purchase of state owned forests. A conservation council composed of interested organizations is ardently supporting this issue.

"The State Land Board of Oregon is expected to approve the exchange of numerous isolated sections of timbered school land for a single tract now under control of the federal Forest Service.

"Idaho chambers of commerce are campaigning for a state forest policy which will obtain federal co-operation under the Clarke-McNary bill. A similar activity is under way in Arkansas.

"In Georgia the Rowntree-Haddock bill, providing for a state forestry department and a forest fire protection system failed to pass in the last session of the Legislature. It will be introduced at the next session."

"The Council," said ex-Governor Hartness, "will enlist the co-operation of all interested organizations in every state in carrying on a campaign to effect the passage of such legislation and changes of forestry policy as will enable the state to co-operate fully with the federal government in carrying out the provisions of the Clarke-McNary Act."

## Supreme Court Denies Writ to Pennsylvania Mining Co.

The U. S. Supreme Court on Dec. 15 denied a writ of certiorari sought by the Pennsylvania Mining Co. to review a decision of the Eighth Circuit Court of Appeals in reversing and remanding for a new trial by the federal District Court at Ft. Smith, Ark., a suit brought by the company against the United Mine Workers of America and others.

This suit is a companion to the famous Coronado Coal Co. case. Alleging that the union had interfered with interstate commerce by obstructing operations at its mine in Johnson County, Ark., the Pennsylvania Mining Co. brought suit for triple damages under the Sherman anti-trust law. A jury in the District Court awarded \$100,000 in 1920, and judgment for treble this sum was entered. The union appealed. Meanwhile the Coronado case, along similar lines, went to the Supreme Court, which decided that interstate commerce had not been affected. On retrial of the Coronado case the lower court gave a verdict for the defendant union. The Coronado company appealed. Both this latter appeal of the Coronado company and the appeal of the union from the verdict in favor of the Pennsylvania company were argued before the Eighth Circuit Court of Appeals last July, as similar issues were involved. The Circuit Court of Appeals, affirming the decision dismissing the Coronado case—that company appealed again to the Supreme Court—reversed and remanded for a new trial in the District Court the case won by the Pennsylvania company, using the Supreme Court opinion in the original Coronado case as a precedent.

The petition of the Pennsylvania company for review by the Supreme Court was denied because the decree of the Court of Appeals was not a final judgment, the case having been remanded for further action in the District Court.

## Non-Union Competition Closes Florence Mine

With the ending of work on Saturday evening, Dec. 13, 250 miners employed by the Rochester & Pittsburgh Coal & Iron Co. at the Florence mine, Delancey, Pa., were thrown out of employment. When the men reported for work on Monday morning they found a notice posted at the mine announcing that the mine had been closed because the present union scale of wages made it impossible to compete with non-union mines.

The announcement was signed by the president of the company, B. M. Clark, who also is president of the Central Pennsylvania Coal Producers Association. Mr. Clark recently had several exchanges of letters with John Brophy, district union president, on the advisability of modifying the Jacksonville wage agreement in order to rehabilitate the coal industry of central Pennsylvania.

Every mine of the Rochester & Pittsburgh Coal & Iron Co. is now idle. Several months ago other mines were closed and the working was concentrated in the Florence mine, which is said to be a low cost mine. However, the company does not see its way clear to continue operating at a loss.

Officers of the company feel that if the United Mine Workers in the central Pennsylvania field would save itself from disintegration it must meet the operators of the district and agree upon a scale of wages that will enable the operators to meet competition. Otherwise it will only be a short time until none but open shop mines will be running and there will be no financial resources upon which the union may rely. Of the approximately 30,000,000 tons of coal produced in the field since April 1 of this year only a little over one-third came from the union mines.



## Hoover Peace Means Death For Pennsylvania Mining, Charles O'Neill Declares

"Unless production costs are revised, mining in central Pennsylvania may soon be a lost art," declared Charles O'Neill, secretary of the Central Pennsylvania Coal Producers' Association, in answer to Herbert Hoover, Secretary of Commerce whose aid was solicited in effecting a modification of the wage agreement obtained through his intermediation at Jacksonville, Fla. Mr. O'Neill declares that the peace Secretary Hoover seeks is the peace of death for the Pennsylvania operators and miners.

Continuing, Mr. O'Neill says: "Many of the mines in our district for nearly a year have been losing heavily. The operators have seen their markets torn away by other districts and have been able to hold old customers only by selling fuel at a price that is considerably less than the cost of producing it. Obviously, this course cannot be continued indefinitely.

"Secretary Hoover declares that eventually this will be beneficial to the industry, since he declares that many mines should be abandoned. We of the central Pennsylvania field do not feel that we should be the victims of the program. Neither do we believe that it will work out as Secretary Hoover predicts it will. For every mine that is closed in Pennsylvania a new mine is being opened in West Virginia and Kentucky. At the end of three years of peace there probably will be more mines and miners than there are today but they will be in the South.

### Southern Mines Gaining

"Ten years ago central Pennsylvania produced 15 per cent of the soft coal consumed by this country. Today our production is about 8 per cent. In the same period production in the Southern field has increased tremendously. Today West Virginia and Kentucky are sending coal into Eastern markets formerly held by the central field. We believe the cross hauling is uneconomic to the highest degree. It imposes an unnecessary burden upon transportation facilities of the country and at the same time is an injustice to the central Pennsylvania operators, who have hundreds of millions of dollars invested in their plants.

"Coal is being produced in West Virginia at a cost so much under that produced in Pennsylvania that the operators in the former state can absorb the difference in freight rate to the great Eastern consuming centers and still undersell Pennsylvania coal.

"We contend that this is an unwise and uneconomic condition. Coal should be consumed at points as close as possible to the sources of production. If Secretary Hoover's program resulted in the elimination of mines and miners, it might have some justification."

Mr. O'Neill gives further reasons why the policy is wrong and continues: "We have endeavored to demonstrate to Mr. Hoover that it is contrary to sane national policy to drive coal mining out of a large section of Pennsylvania. The coal here is of exceptionally high grade and should be

## Maybe It Was a Pocket Of Gas

A new financial hazard for coal operators may be presaged in a damage suit recently filed by a Pittsburg (Kan.) boy, through his father, against the Western Coal & Mining Co. The boy says he picked up a pocketful of powder at one of the Western mines, and that later that day, while hunting with some other boys, the powder caught fire in his pocket and he was burned. The father accuses the company of negligence, and asks \$3,000 damages.

utilized in its natural consuming territory, which is the eastern Atlantic and New England states."

Mr. O'Neill then points out the disadvantages of allowing Southern coal to undersell and move across the mines in Ohio to lake ports, move across Illinois to upper Mississippi points and be accorded rates that make it possible to enter the Southwest through the St. Louis gateway.

He then says: "It is thus easily seen that the old established mines in the greatest producing territory in the whole country are slowly but surely being destroyed by competition from Southern fields made possible because Secretary Hoover seeks to permit economic forces a free play for a number of years which an arbitrary factor prevents.

"We are asking our miners to accept a wage scale that is established in West Virginia and Kentucky plus whatever freight differential may exist between those states and Pennsylvania. If this proposal is accepted, the mines of Pennsylvania can continue in operation, and they also will recapture much of the business that has been lost during the past year."

## Wants More Mine Guards In Western Kentucky

Authority to use extra federal guards in the western Kentucky coal mining district to enforce an injunction against striking union miners was requested in a telegram Dec. 20 to Attorney General Stone by L. E. Barnes, chief Deputy United States Marshal at Louisville.

An attempt to dynamite the home of Robert Rolin, superintendent of the Rockport Coal Co., at Centretown, Dec. 19, is believed to be the cause. Details are lacking because of broken telephone or telegraph lines, but it is understood that no members of the Rolin family were injured. Windows were shattered.

A temporary injunction was granted in federal court at Louisville Dec. 18 against thirty-eight union officials, including local union heads in Muhlenberg County, following charges by the Roger Brothers Coal Co., of Bevier, that striking union men intimidated non-union workers on company property.

State officials endeavoring to investigate the dynamiting were handicapped by inability to obtain information from Centretown.

## Decries Quack Remedies for Industrial Ills

That the recent repulse of radicalism by the English-speaking peoples on each side of the Atlantic shows encouraging progress in political sanitation was one of the points made by James A. Emery, counsel for the National Manufacturers' Association, in the course of remarks at a luncheon in Washington, Dec. 17, at which the Smokeless Coal Operators' Association was host. The radical movement in the United States was compared with the quack in the vending of his wares on the street corner, where the audience is large but purchasers few. Despite the advertising, pink pills for a pale nation failed to sell.

While Mr. Emery said some producers should talk less about their rights and think more of their obligations, he declared there is less excuse at present for the intervention of government authority in the conduct of such an industry as is coal production than ever before. It is plain, he declared, that the public wants intervention in the territory of business to proceed no further.

The luncheon was a feature of an association meeting, at which officers were elected for the ensuing year. William D. Ord, president of the Empire Coal & Coke Co., of Landgraff, W. Va., was elected president; William C. Atwater, of New York, first vice-president; W. D. Tams, Jr., of Tams, W. Va., second vice-president; G. H. Caperton, treasurer, and E. J. McVann, secretary.

The bylaws of the association were amended to permit of the appointment of an additional member to the board of directors, so as to provide representation for the new Greenbrier Operators Association. E. S. Simpson was selected to represent the association on the board. The Pocahontas Association will be represented on the board during the coming year by T. S. Farrell and L. Rodman Page, Jr.; the New River Association by G. H. Caperton and Holly Stover; the Winding Gulf Association by W. Gaston Caperton and P. M. Snyder. The directors for the Tug River Association could not be designated until after the meeting of that organization.

The membership committee for the next year will consist of E. White, W. C. Atwater and M. L. Carbey. The transportation committee is to consist of T. S. Farrell, Oscar M. Deyerle and S. C. Higgins.

Coal to the extent of 271,186 tons was used in connection with the manufacture of dyestuffs and tanning materials during 1923, according to the Bureau of the Census. Similar figures covering other industries are as follows: Flags and banners, 1,422 tons; wood, turned and carved, 25,434 tons; cotton-lace goods 66,569 tons; asbestos products, not including textiles, 53,801 tons; sponging and refinishing of cloth, 1,962 tons; paints and varnishes, 83,962 tons; wooden packing boxes, 52,678 tons; paving materials, 542,409 tons; photographic apparatus and materials, 170,417 tons.



## Greater Activity by Labor in Politics Presaged by Death of Gompers

Powers of Leadership, Keen Intelligence and War Work Soften Critical  
Shafts Against Dead Leader—Policy Vindicated by  
Result of Recent Election

By PAUL WOOTON  
Washington Correspondent of *Coal Age*

The death of Samuel Gompers has peculiar significance to those engaged in coal mining, an industry in which the matter of labor relations constitutes its most acute problem. It is interesting to see how public opinion usually changes after a man's death. Mr. Gompers has been as bitterly attacked, at one time or another, as were Woodrow Wilson or Henry Cabot Lodge. Judging from the newspaper comment his death, as in the case of Wilson and Lodge, has softened the asperities of criticism.

Samuel Gompers always was recognized by those who opposed him as having great power of leadership, of possessing keen intelligence and a great facility of expression both by word and by pen.

The death of labor's leader calls to mind again that he rendered the country a great service during the war. There was nothing of the pacifist in his makeup. At no time was there any suspicion that he was in any way pro-German. He hated Bolshevism and Bolsheviks, and particularly the parlor variety. The remarkable speed with which the man-power of the country was mobilized was due in no small degree to the hearty support of the plan by the president of the American Federation of Labor.

The death of Gompers had been anticipated for a long time before the actual arrival of the Grim Reaper. It had been the source of much speculation. For many years it had been accepted as a matter of course that Gompers would remain president of the American Federation of Labor as long as he lived. For that reason all of the plans for changes in the Federation's policies have been predicated on the assumption that they would be launched after Gompers' death. Gompers was a thorough-going conservative. He was as thoroughly opposed to social nostrums as were the captains of industry. There has been no more bitter critic of Red Russia.

Not only that, for Mr. Gompers was entirely out of sympathy with those who, like Ramsay MacDonald, would draw labor into partisan politics. His whole philosophy was to build up a collective bargaining power of labor and work for such immediate ends as higher wages, better working conditions and shorter hours through the exercise of that bargaining power.

He had no sympathy for a separate labor party. The intensity of his convictions on that point resulted from his vivid personal experiences in his early days, when he was identified with the unsuccessful Knights of Labor. This organization in the eighties attempted to improve the condition of labor through acquiring political positions. They failed in their political efforts and, having no achievements to show

the rank and file of labor, the organization quickly lost its hold on the workers and fell to pieces.

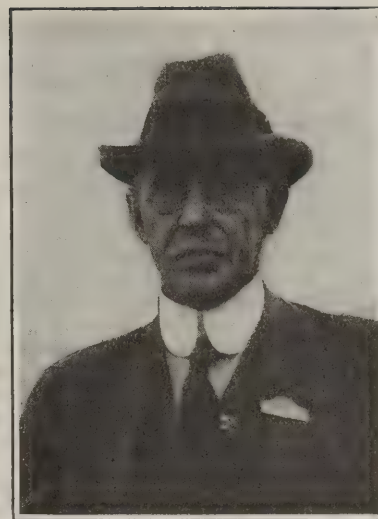
The American Federation of Labor was a reaction against this overambitious policy. Gompers was convinced that the way to get ahead was to concentrate on such concrete objectives as the eight-hour day, higher wages and workmen's compensation. All proposals to weld labor into a political machine brought forth anathema from Gompers. He urged the unions to judge each candidate according to his attitude toward their immediate objectives. His policy was to help those who befriended those policies and to work against those who opposed them, regardless of party. The success of this policy in obtaining such objectives as higher wages, shorter hours and better working conditions has been so conspicuous that it bids fair to be labor's permanent policy, particularly in view of the débâcle which followed a departure from that policy forced upon Gompers during the last campaign.

### Was Against Partisan Politics

It was impossible for even as dominant a character as Gompers to withstand altogether the tide which had swept labor in Germany, France, Great Britain and other countries into one political party. Temporary advantages which had come to labor in Europe greatly strengthened the case of those who urged the American Federation to adopt a similar course. Gompers finally, against his better judgment, was prevailed upon to allow the majority view to prevail.

Despite the complete failure of labor's effort at the last election and the evidences of weakness in the labor parties abroad which have been revealed since labor decided to go along with Senator LaFollette, it is known that the death of Gompers is to see a determined struggle to change the policy of the American Federation of Labor from that advocated by Gompers to that of establishing a political machine over which labor will have entire control. There is no reason to believe that such an effort will prevail. The reversal of the Gompers policy during the last campaign proves to have been the most effective step that could have been taken to confirm it. It furnished a striking vindication of Gompers' traditional position. Had he deliberately planned to spike the proposed change it could not have been done more effectively.

If such an effort were to be successful conditions certainly favored it last summer. There was widespread discontent among the farmers. For that reason more of them were willing to join with labor in a political effort than ordinarily would be the case. The



F. F. Sharpless

Secretary of the American Institute of Mining and Metallurgical Engineers. Snapped by W. E. E. Koepler on the Birmingham trip of the institute while the doctor was in deep cogitation.

United States with all of its manufacturing presents no such conditions as exist in Great Britain, for instance. Despite industrial growth the small farmer continues to occupy a dominant political position. His interests as a rule are not identical with those of the wage earner. The farmer in the United States, like the farmer of other countries, is a conservative. He is a property owner and he has little sympathy for state socialism or anything that approaches it, because he knows government enterprises must be supported by taxation. Gompers was convinced that there could be no permanent alliance between wage earners and farmers.

Advantage will be taken of the death of Gompers by those who want to change the Federation's policies to launch their efforts. There is certain to be something of a struggle and issues may be confused for a time, but the prospects all are that the policies of Samuel Gompers will thrive even more vigorously now that he is dead.

### Coolidge to Call Conference On Mine Safety

In order to reduce the loss of life in the coal mining industry a national conference will be called early next year by President Coolidge. Steps already have been taken by the U. S. Bureau of Mines to arrange a program for the conference, and invitations will be sent out soon after Governors-elect in the coal states have taken office.

The frequency of coal mine explosions with great losses of life, together with the ordinary hazards of the industry, have led to a conclusion on the part of the President and Interior Department officials that the federal government might properly seek the co-operation of the states in promoting greater safety to coal mine workers.

The Governors of all of the principal coal-producing states are to be asked to send representatives, and, as planned, the gathering will include federal and state authorities and representatives of the management and of the workers in the industry.



## Oklahoma Slowly Breaks Grip of Union And Returns to 1917 Scale

After Summer of Trouble 84 per Cent of Output Now Produced by Union Men Paid Basic \$5 a Day — Henryetta Field Alone Pays \$7.50 — Operators Quit Association

Eighty-four per cent of coal now being produced in Oklahoma, it is estimated, is being mined by 28 mines under the 1917 wage scale, representing a substantial reduction from the scale of 1924. Henryetta, alone, of the important coal mining districts of the state, is operating under the 1924 scale, which is a heavy handicap in competition with operators of the McAlester and Wilburton fields.

The movement toward lower wages and the open shop really started last April at the time of the scale conference in Kansas City, when members of the Southwestern Interstate Coal Operators' Association and representatives of the United Mine Workers of Kansas, Arkansas, Oklahoma and Missouri signed a three-year contract on a basis of the high post-war scale. At that time operators declared the scale confiscatory, and those of the Henryetta (Okla.), the Kansas, Missouri and Arkansas fields who signed, since have had open fewer mines than in preceding years.

McAlester and Wilburton were not represented generally at the Kansas City conference. There operators at first refused to accede to the demands of the miners for a three-year extension of the high scale. The mines were idle during the summer until July, when the open shop movement became active. Those operators who then began to clean up in readiness for opening moved cautiously. They employed no brass bands to advertise their intentions. Here and there operation was started on a small scale, opposed, naturally, by union officials, but made possible by individual members of the union, who, after several months of idleness, were in need of employment.

### Conditions Favor Resumption

Here a situation peculiar to the district acted to aid operators resuming production. The district employs few itinerant miners. Many of them own their homes. They preferred to remain where they were at a smaller wage than to seek higher wages in other fields. And when, in the late summer, they perceived they were following a lost cause in holding out for a three-year extension of the 1923 scale, many were ready to accept offers of the 1917 scale.

For several weeks there were sporadic but insignificant clashes between those who had returned to work and those others who continued to refuse to work for less than they had received in 1923. These grew more severe and finally culminated in organized attacks on mines in the Wilburton district, most notable of which were the Kali-Inla raids of July 18 and Sept. 7, in which open shop workers were shot from ambush, and the attack on Rock Island No. 12, Oct. 6.

Oklahoma national guardsmen were sent to the aid of county officials.

Localities in which trouble had occurred were under virtual martial law until last month, while those mines whose operation had brought on the trouble continued to work and others were opened. The number of deserters from the hold-out faction steadily increased until organized opposition melted away. Last week production in the Wilburton and McAlester fields averaged between 5,000 and 6,000 tons a day.

The mines are not operating on written contracts. At each there is a verbal agreement between the company and the miners as individuals that the scale shall be that effective in November, 1917; that disputes shall be referred to an arbitrator selected by the mine foreman for the company and a committee of miners, and that other working conditions shall be the same as those in effect through the remainder of the Southwestern district under the 1924 contract.

The day wage scale under which the mines now are operating is on a basis of \$5; under the 1924 Southwestern contract it would be \$7.50. The pick scale is on a basis of \$1.01 a ton; under the 1924 contract it would be \$1.25 a ton. There is a 14c. differential between the pick scale and the electric chain machine scale for those mines using machines, allowing a loading price of 72c. a ton, and a runners' and helpers' rate of 15c. a ton.

### Many Mines Affected

Among the companies that now are working on this basis are the Rock Island, one mine, No. 12, at Harts-horne; Great Western Coal & Mining Co., two mines, Krebs; Oak Ridge Coal & Mining Co., one mine, Red Oak; Hailey-Ola Coal Co., three mines, Hailey; Milly-Dow Coal Co., one mine, Dow; Pete Pierce Coal Co., one mine, Carbon; Kali-Inla Coal & Mining Co., one mine, Cambria; McAlester-Edwards Coal Co., three mines, which have been operating open shop three years near Pittsburg, Okla.; the Osage Coal & Mining Co., two mines near Harts-horne; Deegnan & McConnell, three mines at Wilburton; two mines at Coal Gate, and five small slope mines near Lutie, about two miles from Wilburton.

This makes a total of 25 mines using the 1917 scale and the number increases with the market. There are about 60 shipping mines in these fields. All those operating under the new arrangement have withdrawn from the operators' association which signed the Jacksonville agreement.

### Miners Want Tax Repealed

Repeal of the anthracite tax will be sought at the coming session of the Pennsylvania Legislature by the anthracite miners, it has been learned at the office of Thomas Kennedy, president of District No. 7, at Hazleton.

## Expect Anthracite Strike to End This Week

Scranton, Pa., Dec. 22.—Officials of District 1, United Mine Workers, expect a break in the strike of 12,000 Pennsylvania and Hillside Coal & Iron Co. mine workers this week.

Rinaldi Cappellini, district president, announced yesterday that he would attend a special meeting of the Underwood Colliery strikers in Olyphant today and take a vote of the men on a proposition to end the strike immediately and allow him to handle the Underwood grievances. He declared that he would meet with all of the other locals affected by the general committee's strike order and submit his request for a poll on the ending of the walkout to the membership of the individual locals.

Members of the investigating committee sent here by John L. Lewis, International president, have left for their homes for the holidays.

Twelve thousand employees of the Lehigh Valley Coal Co. who planned to take a vote this week on the question of joining in a sympathy strike with the 12,000 employees of the Pennsylvania Coal Co., who have been idle three weeks, were warned by district union leaders that any such action would be recognized as a violation of union laws and would be dealt with accordingly.

The District Executive Board in special session at Scranton sent telegrams to the twelve local unions of the Lehigh Valley Coal Co. advising them to live up to their contracts and not to vote for a strike.

## Court Allows Trial by Jury In Labor Disputes

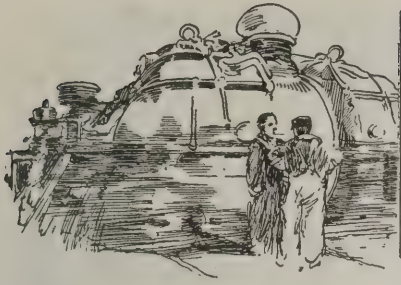
The U. S. District Court for the Western Kentucky division, at Louisville, was reversed Dec. 11 regarding right of jury trial for defendants in labor disputes by the U. S. Circuit Court of Appeals at Cincinnati, which based its judgment on a recent decision of the U. S. Supreme Court. The lower court fined S. C. Nandefor and Letcher Martin, leaders of employees of the Canoe Creek Coal Co. for contempt of court in violating an injunction order restraining employees and United Mine Workers from interfering with the operations of the company in any way.

The men demanded trial by jury, which was refused by the lower court in its interpretation of Sec. 22 of the Clayton Act. The Circuit Court of Appeals, on the previous decision of the Supreme Court, held that this section was no bar to the rights of the men to trial by jury.

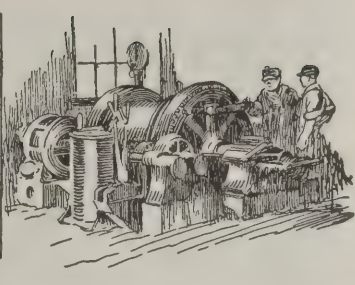
## S. D. Warriner Off Mine Board

Samuel D. Warriner, of Philadelphia, president of the Lehigh Coal & Navigation Co., announced his resignation as a member of the Anthracite Conciliation Board at a meeting Dec. 20 at Hazleton, Pa., of operators whose mines are in District No. 7 of the United Mine Workers. Mr. Warriner said that his resignation was due to pressure of other business. His brother, J. B. Warriner, general manager of the Lehigh Coal & Navigation Co., was elected to succeed him.





## Practical Pointers For Electrical And Mechanical Men



### Slope Switch Controlled By Operator Stationed in Hoist House

Wire Rope Connects Spring-Operated Switch with Hoist—Device Saves Time and Reduces Labor

At the Big Four mine of the Pond Creek-Pocahontas Co., Big Four, W. Va., a simple arrangement for throwing a switch from a distant point was recently applied. This device reduces labor and eliminates delay.

In the background of Fig 1, is the hoist house in which has been installed a new 300-hp. electric hoist. The straight track leading away from the building goes directly down the mine slope which is served by the hoist. Seven-car trips are pulled up through the spring-operated open switch shown in the foreground and are then allowed to run by gravity back on the turnout from this switch and on to the tippie.

The empty-car track is seen on the left of the illustration. From this point the trip of empties is pulled onto the main track and then lowered down the slope. This makes it necessary temporarily to close the switch—shown in the immediate foreground—against the force of the holding spring. Formerly this was done by hand in the ordinary way but now it is performed by the hoist operator, a wire rope being connected to the switch and leading into the hoist house. The rope can be seen lying along the ends of the ties.

The operating lever to which the rope is attached is shown in Fig. 2. This

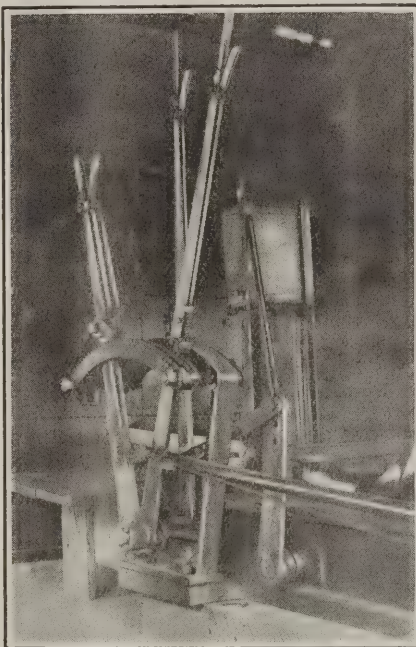


Fig. 2—Switch-Operating Lever

The short outside lever on this electric hoist is connected by a wire rope to a track switch located at the top of the mine slope.



Fig. 1—Track Switch Operated from Hoist House

When a trip of empties is to be let down the slope, the switch in the immediate foreground is closed by the hoist operator. This is accomplished by pulling on the small wire rope. When the tension on the rope is released the coil spring returns the switch to its normal position.

short lever has been added alongside the regular clutch and brake levers. The lever and quadrant were removed from an old steam hoist. It so happened that few changes were necessary to adapt them to the electrical unit. With the present arrangement when empty trips are to be let down the slope there are no delays nor misunderstandings. The control of the switch is, as it should be, entirely in the hands of the hoist operator.

### Test Device and Transformer Safe and Portable

When making high-voltage tests on armatures and other parts of electrical equipment repaired in the mine shop, certain precautions must be taken when handling the high-voltage cables leading from the source of the voltage to the equipment being tested. This problem is simplified by using a portable transformer, in which case the high-voltage test leads can be made short. When short cables are used they may be heavily insulated, thereby greatly reducing any chance of accident.

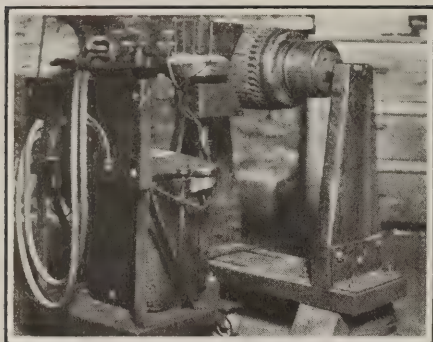
Another advantage of having the high-voltage transformer portable is that when so arranged it can be moved to a position close to the work. This brings the transformer tap switch within convenient reach of the operator, making it easy for him to adjust the voltage as desired. The fact that this switch and the entire high-voltage apparatus are in sight, and reach, of the operator adds to his safety and no doubt to his ease of mind.

The illustration shows a portable testing transformer used in the central repair shop of the Hillman Coal and Coke Co., at Brownsville, Pa. Mounted on the same platform with the transformer is an armature-testing device. The height of the magnets is adjusted to various armatures by simply raising or lowering them by hand and inserting a large spike into the proper hole of the telescoping standard. This support is made from two sizes of common pipe one inside the other. The platform carrying the transformer and testing magnets is mounted on three, easy-running, casters.

On the outside of the transformer are three primary leads which, by proper connection to the 220-volt supply line, afford three voltages for each position of the dial switch. The range of voltage is as follows:—for point 1—200, 280 and 450 volts; for point 2—450, 500 and 775 volts; for point 3—550, 750 and 1,375 volts; for point 4—800, 1,100 and 1,650 volts; and for point 5—850, 1,875 and 2,400 volts.

The positions of the switch for obtain-





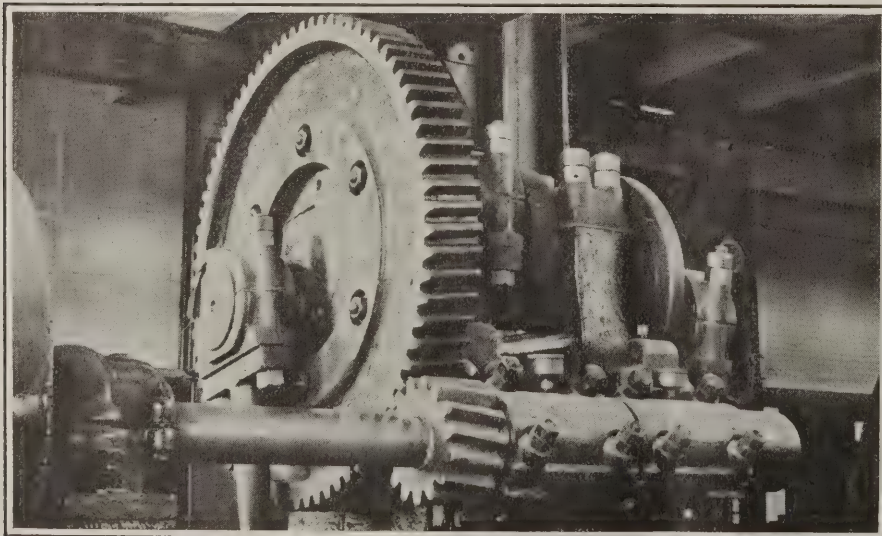
#### Armatures May Be Tested Safely With This Outfit

The testing device and transformer are mounted together, on three casters. The high-voltage testing leads, insulated with rubber hose, are hanging over the top of the board on which the dial switch is mounted.

ing these voltages are marked on the board beside the dial. High-voltage cable covered by heavy rubber hose is used for test leads. Thomas Booker, foreman of the Brownsville shop, explained that the armature testing equipment has no electrical connection with the transformer. Portable leads from the 220-volt supply line are connected to the magnet when they are used for testing an armature. This outfit, including the magnets was made at the Brownsville shop. The transformer was made up from an ordinary unit which had burned out in service.

#### Found That One Set of Gears Was Better Than Two

Helical gears are now being used on many classes of mine equipment. The double-helical, or herringbone gear has been applied to hoisting equipment for many years, and today it is not uncommon to see helical gears in use on mine locomotives. It is claimed that the helical gear is stronger, operates more smoothly and makes less noise than the plain spur gear. Herringbone gears are considered better than plain helical gears because they neutralize thrusts.



#### Tooth Breakage Eliminated by Use of One Gear Set of Helical Type

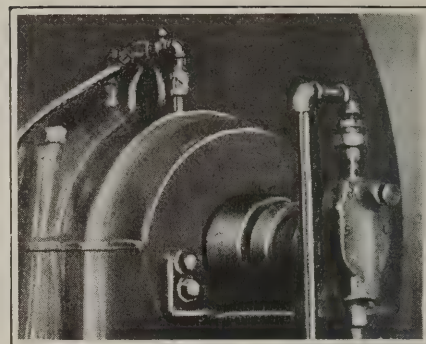
Originally this pump had a large, plain spur gear on each of the two outside crank disks, and a pinion on the countershaft. An investigation of gear breakage disclosed that due to imperfect machining or assembling one pair usually did all the work. Consequently, one gear and its pinion were dispensed with and the others replaced by the helical type which, due to the tooth design, has greater strength.

The Pittsburgh Coal Co. has improved its vertical triplex mine pumps by taking advantage of the greater strength of helical gearing. As originally built these pumps had a large spur gear bolted to each outside crank disk. These gears were driven from a countershaft to which were keyed two pinions. The duty on these pumps is rather severe and as a result there were many cases of broken gearing.

Before making this change, A. B. Kiser, electrical engineer for the coal company, made an investigation which proved that usually one gear transmitted all the load, because it is exceedingly difficult to set two pinions on the countershaft so accurately that the teeth of both will bear with equal pressure on their mating gears. Even if the pinions were set on the shaft exactly right, the slightest movement or slippage of either would throw all the load on the other. It was therefore apparent that one gear and pinion set should be dispensed with and the other be replaced by heat-treated gears of the helical type. One of the pumps on which this change had just been made is shown as it appeared when in the company's central shop at Library, Pa. The gear guard was removed so that a photograph might be taken.

#### Improves Lubrication of Motor-Generator Set

When a bearing on a large machine fails it is usually a serious matter. The 700-hp., flywheel, motor-generator set which supplies the 1,100-hp. direct-current motor of the main hoist at mine No. 251, known as Coalwood Shaft, of the Consolidation Coal Co., Coalwood, W. Va., was originally lubricated by ring-oiled bearings. There are five bearings on this motor-generator set, including the one small bearing on the outside end of the direct-connected 40-kw. exciter. A failure of one of the large bearings prompted Alexander Harley, superintendent of the power and mining department of this division, to devise an auxiliary system.



#### Oil Pump Improves Lubricating System of Large Machine

Sight-feed fittings and petcocks for regulating the flow can be seen above the bearing. In the upper right-hand corner of the room is the 40-gal. gravity feed tank.

The new equipment consists of a gravity-feed system by which two small streams of oil flow continually on top of the shaft at each bearing. The overflow from the oil-cellars runs by gravity to a 10-gal. tank which is located in the flywheel pit just below the floor level. From that point the oil is pumped to a 40-gal. tank set on a platform about 6 ft. above the bearings.

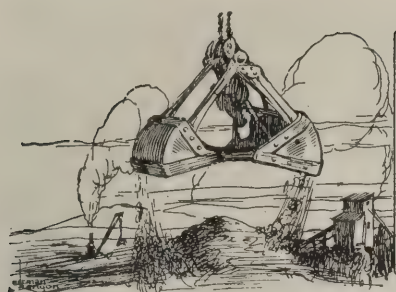
It is interesting to note how the gear-type pump is driven from the shaft of the motor-generator set. The pump is mounted on a forged iron bracket attached to the lower half of the outside bearing of the 700-hp. induction motor. The pump pulley—which is not used as a pulley but instead as a coupling—is set parallel to, and within about  $\frac{1}{2}$  in. of the end of the shaft and is driven by three small studs which are screwed into holes tapped in the end of the shaft. These studs extend and fit loosely into holes drilled in the web of the small solid-spoked pulley.

The original ring-oiling system of the motor-generator set was in no way disturbed by the application of the additional equipment. Therefore, if for any reason, such as insufficient oil or pipe stoppage, the new system should fail, the machine will still receive lubrication from the oil cellars which are always kept full of oil. No bearing trouble has been experienced since the pump and gravity method of lubrication has been added.

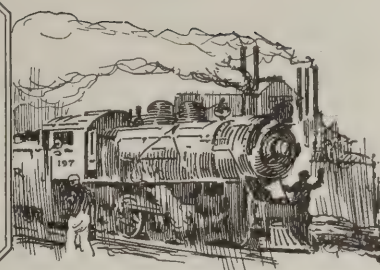
#### Insulation Resistance Depends On Design of Coil Slots

When measuring the insulation resistance of a motor winding it is important to remember that insulation resistance is directly proportional to the thickness of the insulation and inversely proportional to the area. In view of the fact that different manufacturers use different materials and different thicknesses of insulating materials, it is possible to find quite wide variations between motors and generators of the same voltage and power ratings. This accounts for the fact that one manufacturer may turn out a motor with 5 megohms resistance while another manufacturer makes a motor of the same characteristics which measures 25 megohms.





## Production And the Market



### Coal Markets Mark Time Save for Fitful spurts And Halts With Weather Changes

With the end of the year in sight the usual pre-inventory attitude of hesitancy pervades the coal market—no one, apparently, desires to place any orders that can possibly be deferred until next month. This disposition to hold off has created a condition of over-supply with all the attendant evils of no bills, distress coal and a softening tendency in prices. The weather, of course, is an important factor, and this at last seems in a fair way to come, at least temporarily, to the rescue of the harassed coal man after an almost unprecedented stretch of mild temperature.

One of the most interesting developments of the season in the bituminous coal industry was the announcement last week of a 25 per cent increase in wages by independent operators in the Connellsville region of Pennsylvania, bringing the scale to the peak level of 1920. Special significance attaches to the action of these producers in view of the effect it will have on the miners in adjacent regions who will be less likely now than ever to ask for an abrogation of the Jacksonville agreement, and a lower wage such as will enable the mines to resume active operation. Orders for the blowing in of nearly 2,500 ovens by the Connellsville plants have been given, which would seem to substantiate in striking fashion the reports of steady improvement in the iron and steel trade. The note of confidence in the industrial prospect gains steadily in strength, Judge Gary having joined the prophets of prosperity just ahead.

#### Demand for Hard Coal Lacks Strength

Trade in anthracite on the whole lacks strength, demand being such that supplies are more than sufficient to take care of requirements. Lower temperatures and curtailment of output by labor difficulties have been steadying influences on independent prices, but even they

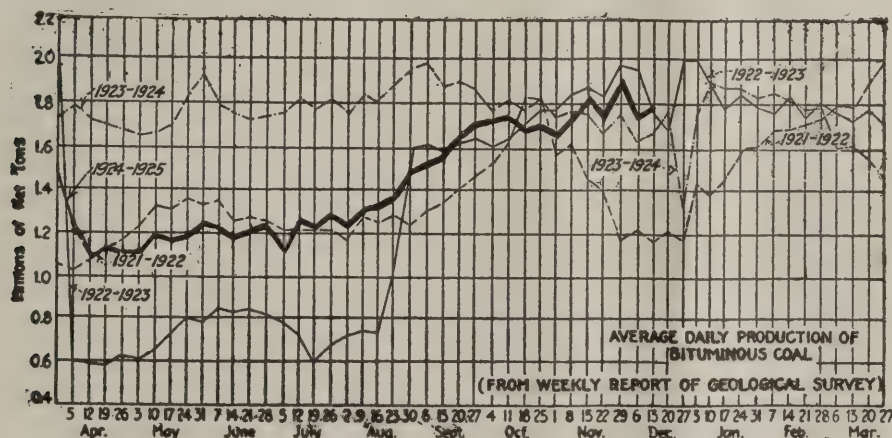
could not prevent a slight sag in quotations from last week. Chestnut has forged ahead of stove in popular demand, the keenness of the call for the latter being less noticeable, due in part to the breaking down of egg by some producers. Pea continues sluggish and steam sizes move slowly. With the double purpose of taking care of the demand for chestnut and moving pea coal one of the large companies has introduced what it calls "special chestnut," a mixture of two-thirds chestnut and one-third pea, quoted at \$8.30 per gross ton f.o.b. mine.

Coal Age Index of spot prices of bituminous coal advanced one point during the last week, standing on Dec. 22 at 170, the corresponding price for which is \$2.06, compared with 169 and \$2.04 respectively on Dec. 15.

#### Recession in Activity at Hampton Roads

A marked reaction in activity was in evidence at Hampton Roads during the week ended Dec. 18, when dumpings of coal for all accounts totaled 400,188 net tons, compared with 479,099 tons in the preceding week.

Production of bituminous coal registered a further advance during the week ended Dec. 13, when, according to the Geological Survey, the output was 10,723,000 net tons. This was an increase of 111,000 tons, revised figures show, over the previous week's total, and that despite the fact that production was curtailed somewhat in the Central Western States by the miners' election day on Dec. 9. This was the fifth successive week in which production was higher than that for the corresponding week of 1923. Anthracite output during the week ended Dec. 13 was 1,772,000 net tons, compared with 1,814,000 tons in the previous week and 1,947,000 tons in the corresponding week of last year.



#### Estimates of Production

(Net Tons)

##### BITUMINOUS

	1923	1924
Nov. 29.....	8,943,000	9,640,000
Dec. 6.....	9,829,000	10,612,000
Dec. 13 (b).....	9,936,000	10,723,000
Daily average.....	1,656,000	1,787,000
Cal. yr. to date (c).....	524,136,000	444,520,000
Daily av. to date.....	1,788,000	1,515,000

##### ANTHRACITE

Nov. 29.....	1,691,000	1,611,000
Dec. 6.....	1,837,000	1,874,000
Dec. 13.....	1,947,000	1,772,000
Cal. yr. to date.....	89,899,000	86,424,000

##### COKE

Dec. 6 (a).....	265,000	174,000
Dec. 13 (b).....	240,000	192,000
Cal. yr. to date (c).....	17,391,000	9,134,000

(a) Revised since last report. (b) Subject to revision. (c) Minus one day's production to equalize number of days in the two years.



### Midwest Is Full of Coal

A severe swoop of cold, running the mercury down far below zero, froze the Midwest region last week. It caught the territory so full of coal that there was no immediate effect upon the market, but even had there been a sudden wild demand for coal it could not have been met at once because of handicapped rail transportation, broken wires and the streets so glazed with ice that retailers' deliveries were slowed down. The cold gave indication of continuing as the days passed, and the first of this week was scheduled to mark a considerable stiffening of domestic markets.

The situation before the cold spell arrived was this: Eastern non-union mines, unable to place their output elsewhere, had dumped low-price coal throughout the Midwest, especially in and around Chicago. A great deal of coal had been shipped on consignment. Illinois and Indiana mine tracks were groaning under "no bills" of lump and egg. Screenings were short and the price was steadily rising, so that southern Illinois best fine coal had touched \$1.90 following a rise to \$1.75@ \$1.80 on the part of central Illinois stuff, which is near the Chicago steam market. Indiana Fourth and Fifth Vein screenings also were passing \$1.75 on their way up.

Domestic prices were sagging badly. Southern Illinois lump was dragging badly at \$3.25 though the circular ran up to \$3.50; central Illinois was in trouble at \$3 and good eastern Kentucky lump was very difficult to move at \$2.25@

\$2.50. Then came the cold. The effect was to stiffen prices, but the permanency of this stiffening depends largely upon the length of the cold spell.

Railroad tonnage from southern Illinois is fairly good considering, although the Illinois Central has shut off for the rest of the year. Mines work from one to four days a week, depending on railroad and other contracts. Cars are plentiful. In the Duquoin field there is little change since last week and conditions are somewhat similar to those in the Carterville district, may be a little worse. Strip mines through all of these districts are getting in good working time on account of the pleasant weather prevailing up to now and are moving their coal at a price.

In the Mt. Olive field there is a little activity on coal going to the Northwest and contracts take up the steam sizes. Mines there are getting one and two days a week with some railroad business. There are no changes in prices. In the Standard field there is gloom. The operators are still selling coal below cost and the miners are not making enough to live on. Screenings are strong at \$1.25 with a tendency to come down with the colder weather.

With St. Louis dealers' yards loaded waiting for cold weather there was a surplus of all kinds of coal on hand and in transit. Domestic was almost at a standstill though it picked up a little with the cold. Country domestic also has been quiet but is a little more active than local. There is a tendency to buy middle grade coals rather than high grade, with very little demand for Standard.

### Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern					Midwest						
Market Quoted	Dec. 24 1923	Dec. 8 1924	Dec. 15 1924	Dec. 22 1924†	Market Quoted	Dec. 24 1923	Dec. 8 1924	Dec. 15 1924	Dec. 22 1924†		
Smokeless lump.....	Columbus...	\$3.35	\$4.10	\$4.10	\$3.75@ \$4.00	Franklin, Ill. lump.....	Chicago...	\$3.50	\$3.35	\$3.25	\$3.00@ \$3.50
Smokeless mine run.....	Columbus...	1.85	2.00	2.00	1.75@ 2.10	Franklin, Ill. mine run.....	Chicago...	2.35	2.35	2.35	2.25@ 2.50
Smokeless screenings.....	Columbus...	1.25	1.25	1.25	1.00@ 1.25	Franklin, Ill. screenings.....	Chicago...	1.95	1.50	1.60	1.65@ 1.90
Smokeless lump.....	Chicago...	3.50	3.85	3.85	3.60@ 4.00	Central, Ill. lump.....	Chicago...	3.00	2.85	2.85	2.75@ 3.00
Smokeless mine run.....	Chicago...	2.10	1.85	1.85	1.75@ 2.00	Central, Ill. mine run.....	Chicago...	2.10	2.20	2.20	2.15@ 2.25
Smokeless lump.....	Cincinnati...	3.10	3.85	3.75	3.50@ 4.00	Central, Ill. screenings.....	Chicago...	1.35	1.35	1.65	1.65@ 1.85
Smokeless mine run.....	Cincinnati...	2.00	1.85	1.85	1.75@ 2.00	Ind. 4th Vein lump.....	Chicago...	3.25	3.10	3.10	3.00@ 3.25
Smokeless screenings.....	Cincinnati...	1.75	.95	1.15	1.15@ 1.25	Ind. 4th Vein mine run.....	Chicago...	2.60	2.35	2.35	2.25@ 2.50
*Smokeless mine run.....	Boston.....	4.45	4.10	4.10	4.00@ 4.25	Ind. 4th Vein screenings.....	Chicago...	1.70	1.55	1.55	1.60@ 1.80
Clearfield mine run.....	Boston.....	1.80	2.00	1.95	1.65@ 2.40	Ind. 5th Vein lump.....	Chicago...	2.50	2.75	2.75	2.50@ 3.00
Cambria mine run.....	Boston.....	2.35	2.30	2.30	2.00@ 2.75	Ind. 5th Vein mine run.....	Chicago...	2.10	2.10	2.10	2.00@ 2.25
Somerset mine run.....	Boston.....	2.10	2.15	2.15	1.80@ 2.50	Ind. 5th Vein screenings.....	Chicago...	1.55	1.30	1.30	1.50@ 1.65
Pool 1 (Navy Standard).....	New York.....	3.00	2.80	2.80	2.65@ 2.95	Mt. Olive lump.....	St. Louis.....	3.10	3.00	3.00	3.00
Pool 1 (Navy Standard).....	Philadelphia...	2.95	2.70	2.70	2.50@ 2.90	Mt. Olive mine run.....	St. Louis.....	2.50	2.35	2.35	2.25@ 2.50
Pool 1 (Navy Standard).....	Baltimore.....	2.30	2.30	2.30	2.10@ 2.50	Mt. Olive screenings.....	St. Louis.....	1.75	1.10	1.10	1.00@ 1.25
Pool 9 (Super. Low Vol.).....	New York.....	2.25	2.05	2.05	.90@ 2.25	Standard lump.....	St. Louis.....	2.85	2.75	2.75	2.75
Pool 9 (Super. Low Vol.).....	Philadelphia...	2.35	2.15	2.15	1.95@ 2.35	Standard mine run.....	St. Louis.....	1.95	1.95	1.95	1.90@ 2.00
Pool 9 (Super. Low Vol.).....	Baltimore.....	2.00	1.70	1.70	1.65@ 1.80	Standard screenings.....	St. Louis.....	1.35	1.05	1.05	1.00@ 1.15
Pool 10 (H.Gr.Low Vol.).....	New York.....	1.95	1.80	1.80	1.65@ 2.00	West Ky. lump.....	Louisville...	3.00	2.60	2.35	2.00@ 2.40
Pool 10 (H.Gr.Low Vol.).....	Philadelphia...	1.85	1.75	1.75	1.65@ 1.90	West Ky. mine run.....	Louisville...	1.60	1.60	1.55	1.35@ 1.75
Pool 10 (H.Gr.Low Vol.).....	Baltimore.....	1.90	1.55	1.55	1.50@ 1.65	West Ky. screenings.....	Louisville...	1.30	1.10	1.10	1.00@ 1.15
Pool 11 (Low Vol.).....	New York.....	1.60	1.60	1.60	1.50@ 1.75	West Ky. lump.....	Chicago.....	2.85	2.60	2.35	2.25@ 2.50
Pool 11 (Low Vol.).....	Philadelphia...	1.65	1.45	1.45	1.35@ 1.60	West Ky. mine run.....	Chicago.....	1.75	1.55	1.55	1.40@ 1.65
Pool 11 (Low Vol.).....	Baltimore.....	1.75	1.45	1.45	1.40@ 1.50						
High-Volatile, Eastern					South and Southwest						
Pool 54-64 (Gas and St.)..	New York.....	1.60	1.50	1.50	1.40@ 1.60	Big Seam lump.....	Birmingham..	3.85	3.10	2.85	2.50@ 3.25
Pool 54-64 (Gas and St.)..	Philadelphia...	1.70	1.50	1.50	1.40@ 1.60	Big Seam mine run.....	Birmingham..	1.95	1.70	1.60	1.50@ 1.90
Pool 54-64 (Gas and St.)..	Baltimore.....	1.50	1.45	1.45	1.40@ 1.50	Big Seam (washed).....	Birmingham..	2.35	1.85	1.85	1.75@ 2.00
Pittsburgh so'd gas.....	Pittsburgh...	2.40	2.40	2.40	2.30@ 2.50	S. E. Ky. lump.....	Chicago.....	3.10	2.75	2.60	2.40@ 2.60
Pittsburgh gas mine run.....	Pittsburgh...	2.25	2.10	2.10	2.00@ 2.25	S. E. Ky. mine run.....	Chicago.....	1.85	1.60	1.50	1.40@ 1.50
Pittsburgh mine run (St.)..	Pittsburgh...	2.00	1.85	1.85	1.75@ 2.00	S. E. Ky. lump.....	Louisville...	3.00	2.85	2.60	2.50@ 2.75
Pittsburgh slack (Gas).....	Pittsburgh...	1.65	1.20	1.20	1.25@ 1.35	S. E. Ky. mine run.....	Louisville...	1.60	1.60	1.40	1.35@ 1.50
Kanawha lump.....	Columbus...	2.60	2.30	2.30	2.10@ 2.50	S. E. Ky. screenings.....	Louisville...	1.20	.95	.95	.85@ 1.10
Kanawha mine run.....	Columbus...	1.60	1.55	1.55	1.45@ 1.65	S. E. Ky. lump.....	Cincinnati...	2.85	2.85	2.35	2.00@ 2.75
Kanawha screenings.....	Columbus...	1.05	.90	.90	.85@ 1.05	S. E. Ky. mine run.....	Cincinnati...	1.55	1.55	1.50	1.25@ 1.65
W. Va. lump.....	Cincinnati...	2.55	2.60	2.20	1.85@ 2.60	S. E. Ky. screenings.....	Cincinnati...	1.00	.95	.90	.75@ 1.10
W. Va. gas mine run.....	Cincinnati...	1.45	1.45	1.50	1.35@ 1.65	Kansas lump.....	Kansas City..	4.75	4.75	4.75	4.50@ 5.00
W. Va. steam mine run.....	Cincinnati...	1.45	1.45	1.40	1.30@ 1.50	Kansas mine run.....	Kansas City..	3.25	3.10	3.00	2.75@ 3.25
W. Va. screenings.....	Cincinnati...	1.20	1.00	.95	.85@ 1.00	Kansas screenings.....	Kansas City..	2.00	2.30	2.30	2.25@ 2.35
Hooking lump.....	Columbus...	2.60	2.55	2.55	2.35@ 2.65						
Hooking mine run.....	Columbus...	1.75	1.60	1.60	1.50@ 1.75						
Hooking screenings.....	Columbus...	1.30	.80	.80	1.05@ 1.15						
Pitts. No. 8 lump.....	Cleveland...	2.45	2.45	2.40	2.00@ 2.85						
Pitts. No. 8 mine run.....	Cleveland...	1.90	1.85	1.85	1.85@ 1.90						
Pitts. No. 8 screenings.....	Cleveland...	1.50	1.20	1.35	1.40@ 1.60						

\* Gross tons, f.o.b. vessel, Hampton Roads.

† Advances over previous week shown in **heavy type**, declines in *italics*.

\* Gross tons, f.o.b. vessel, Hampton Roads.

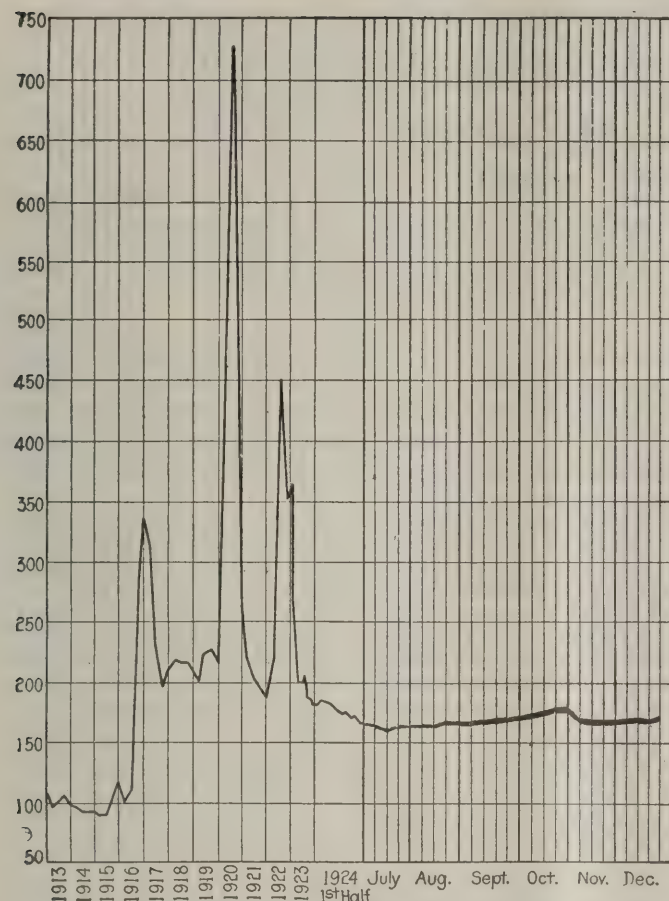
† Advances over previous week shown in heavy type, declines in italics.

### Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

Market Quoted		Freight Rates		Dec. 24, 1923		Dec. 15, 1924		Dec. 22, 1924†	
				Independent	Company	Independent	Company	Independent	Company
Broken.....	New York...	\$2.34		\$8.50@ \$10.00	\$8.00@ \$9.25		\$8.00@ \$9.25		\$8.00@ \$9.25
Broken.....	Philadelphia...	2.39					9.15		9.15
Egg.....	New York...	2.34		9.85@ 10.50	8.75@ 9.25	\$8.25@ \$8.75	8.75@ 9.25	\$8.25@ \$8.75	8.75@ 9.25
Egg.....	Philadelphia...	2.39		9.85@ 12.20	8.75@ 9.25	9.45@ 9.75	8.80@ 9.25	9.45@ 9.75	8.80@ 9.25
Egg.....	Chicago*	5.06		9.60@ 11.50	8.00@ 8.35	8.17@ 8.40	8.08	8.17@ 8.40	8.08
Stove.....	New York...	2.34		9.85@ 11.00	8.75@ 9.25	10.00@ 10.50	9.00@ 9.50	9.60@ 10.25	9.00@ 9.50
Stove.....	Philadelphia...	2.39		9.85@ 12.20	8.90@ 9.25	10.10@ 10.75	9.15@ 9.50	10.10@ 10.75	9.15@ 9.50
Stove.....	Chicago*	5.06		9.60@ 12.50	8.00@ 8.35	8.80@ 9.00	8.53@ 8.65	8.80@ 9.00	8.53@ 8.65
Chestnut.....	New York...	2.34		9.85@ 11.00	8.75@ 9.25	10.00@ 10.50	8.75@ 9.40	9.75@ 10.25	8.75@ 9.40
Chestnut.....	Philadelphia...	2.39		9.85@ 12.20	8.90@ 9.25	10.00@ 10.75	9.25@ 9.40	10.00@ 10.75	9.25@ 9.40
Chestnut.....	Chicago*	5.06		9.60@ 12.50	8.00@ 8.35	8.61@ 9.00	8.40@ 8.41	8.61@ 9.00	8.40@ 8.41
Pea.....	New York...	2.22		6.00@ 6.50	6.15@ 6.65	4.75@ 5.50	5.50@ 6.00	4.60@ 5.60	5.50@ 6.00
Pea.....	Philadelphia...	2.14		6.35@ 7.50	6.35@ 6.60	5.75@ 6.00	6.00	5.75@ 6.00	6.00
Pea.....	Chicago*	4.79		6.00@ 6.75	5.40@ 6.05	5.36@ 5.75	5.36@ 5.95	5.36@ 5.75	5.36@ 5.95
Buckwheat No. 1.....	New York...	2.22		2.00@ 3.00	3.50	2.00@ 2.50	3.00@ 3.15	2.00@ 2.25	3.00@ 3.15
Buckwheat No. 1.....	Philadelphia...	2.14		2.25@ 3.50	3.60	2.50@ 3.00	3.00	2.50@ 3.00	3.00
Rice.....	New York...	2.22		1.35@ 2.25	2.50	1.75@ 2.00	2.00@ 2.25	1.85@ 2.00	2.00@ 2.25
Rice.....	Philadelphia...	2.14		1.75@ 2.50	2.50	2.00@ 2.25	2.25	2.00@ 2.25	2.25
Barley.....	New York...	2.22		1.00@ 1.50	1.50	1.25@ 1.50	1.50	1.25@ 1.50	1.50
Barley.....	Philadelphia...	2.14		1.00@ 1.50	1.50	1.50	1.50	1.50	1.50
Birdseye.....	New York...	2.22		1.25@ 1.45	1.60	1.40@ 1.60	1.60	1.40@ 1.60	1.60

\* Net tons, f.o.b. mines. † Advances over previous week shown in heavy type, declines in italics





Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

Index	1924			1923
	Dec. 22	Dec. 15	Dec. 8	Dec. 24
Weighted average price	170	169	171	178
	\$2.06	\$2.04	\$2.07	\$2.16

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke; 1913-1918," published by the Geological Survey and the War Industries Board.

### Kentucky Was Ready to Shut Down

Summery weather before the cold snap caused a slow market that has resulted in a number of mines closing down until after the holidays, although Kentucky is showing a larger number of operating hours and larger production, with a greater percentage of mines running, probably, than any other state in the Union, figuring on a percentage basis, with the possible exception of West Virginia.

Prices are weak all along the line. It was reported that some West Virginia 4-in. lump had been offered at Louisville at \$1.80 a ton. Some Harlan coal was offered to jobbers at anything they could get for it, the understanding being that it was demurrage coal. West Kentucky 6-in. block is selling at \$2@2.25, with some forced sales reported as low as \$1.60@1.75. Eastern Kentucky block coal is \$2.25@2.50 and as high as \$2.75 asked, with some specialty coals probably selling as high as \$3.25, although \$3 appears to be even above the buying top under existing conditions.

Screenings are selling at 80c.@\$1.10 for eastern Kentucky, with some stock reported at 75c. Western Kentucky is quoting \$1@1.15 a ton. Mine run in either field is \$1.35@1.60, with some as high as \$1.75. Lump, egg and nut are generally quoted at \$2 and under, small nut as low as \$1.40, with some good egg and lump quoted slightly over \$2.

### Northwest Docks Are Rushed

Two more ships, loaded and cleared from lower lake ports on Dec. 12, the last day of the insurance privileges, closed the navigation season at Duluth last week. These ships were not expected this year, hence the report last week that navigation had closed. One of the boats, the E. L. Ford, has arrived with a cargo of Pocahontas at the

Inland dock, and the other, the Grammer, arrived Tuesday night. Dock men assert that the docks are busier now than they have ever been.

Despite the movement, anthracite is still a drug on the market. There is still some Pocahontas left because of recent shipments to the port, but it is stated authoritatively that this will all be gone by the middle of January. Prices are firm all around.

The bituminous movement to North Dakota and northern Minnesota is very satisfactory, and more than makes up for the loss of a great part of the Twin City trade, which is still being served from Kentucky all-rail. Industries also are coming into the field and some have put out their year's specifications already. A few contracts have been let. It looks as if the stocks on docks, which are said to be the largest in history for this time of the year, will be fairly cleaned up before the opening of navigation.

At the Twin Cities real winter weather, with the thermometer below zero, has contributed support to the coal market. Its full effect will not be seen at once. Yard stock must be used first. But prices are stiffening since the cold is beginning to shut off the flow of surplus Chicago and St. Louis coal. Screenings have been steadily rising in price.

At Milwaukee there is a better demand for coal at the docks, and the movement with some dealers is increasing. Dealers are looking for a heavier call for fuel after the holidays, when consumers are expected to begin filling their bins for the real winter months. Navigation is now closed for the winter. During last week Milwaukee received two cargoes of anthracite, amounting to 16,100 tons, and a 7,600 ton cargo of bituminous coal. These cargoes make Milwaukee's receipts for the season 821,962 tons of anthracite and 2,594,623 tons of bituminous coal.

### Western Market Is Steady

A little cold weather in the last week and the promise of more has had a strengthening effect on the Southwestern market. Householders who laid in small amounts early in the fall are being compelled to replenish. There still is a small surplus of coarser grades at the mines, but this is beginning to move. Screenings are becoming scarce.

The Colorado market has softened somewhat due to the sudden appearance of warm weather. Steam and nut coals are really a drug on the market at the present time. Prices on steam coal are listless.

In Utah increased activity in metal mining and smelting is stimulating the slack and coke markets somewhat. The Utah territory has experienced very cold weather in sections during the past week or two, and dealers' stocks are very low as a rule. Mines are working a little better than 60 per cent, but not much. The coast business is described as fair; in the Northwest as "getting better"; Idaho and Nevada "not so good," and Utah "fair." Prices remain steady and collections are improving.

### Conditions Mixed in Ohio

Colder weather north and west has served to bolster up a flagging market at Cincinnati with little spurts of activity. Overproduction is shown by hundreds of "no bill" cars on track. Distress coal is proving a drug on the hope of holding up the price of domestic, and added to this has been open price cutting by large producers in West Virginia. Run of mine for both steam and gas purposes holds to its established keel, while slack, after taking a dip, has recovered from the decrease in the make by mines that have already closed for the holidays. The smokeless market proceeds on its way as usual.

Buying at Columbus is largely haphazard, with many users depending on demurrage coal for supplies. As a result there is little strength shown, and prices, outside of screenings, have weakened perceptibly. Ohio domestic coals are extremely weak and production has slumped. In rural sections coal is scarcer with dealers and a fair business is booked in certain sections. Michigan and Indiana points are pretty well congested, however. Retail prices have softened and some dealers are making low quotations in the hope of cleaning up. Manufacturing has not picked up much and most of the larger consumers have fair fuel stocks. There is a growing scarcity of screenings and prices have advanced sharply.

Slack is scarce compared with demand in the Cleveland market and spot prices have stiffened. Inquiries for other steam sizes are negligible despite the fact that industrial plants throughout this section have but a few weeks' coal



reserves on hand. The railroads are fairly well stocked and retail yards also are pretty well filled up since the domestic trade has been more or less quiet due to the mild weather.

### Situation Changes Little at Pittsburgh

At Pittsburgh a slight increase in spot demand has failed to relieve the highly competitive condition existing. Some shading of prices is suspected; they certainly are no stronger at any point. A technical exception is slack, steam being quotable at \$1.10@\$.1.20 against \$1.10 flat a week ago, and gas at \$1.25@\$.1.35, an advance of 10c. This is attributed largely to light shipment of lump. Independent operators in the Connellsville region have returned suddenly to the Frick scale, adding 25 to 35c. to the cost of producing a ton of coal. This will be reflected in byproduct coal but is unlikely to have any direct influence upon steam and gas coal prices. The steel industry is operating at 80 per cent, against 66 per cent in October.

Little improvement is observable in the Buffalo coal trade. The consumer is very finicky and he will seldom pay full price for a car he may happen to know is stranded. The big smelting furnaces, however, are running at a better rate than they were and the lake trade is already preparing for better business next season. It was pretty nearly spoiled this season by poor ore and coal activity. Bituminous stocks are considerably smaller than they were a year ago and are running down right along. The consumer is eager for bargains and will seldom buy unless he can get them.

### Interest Lacking in New England

In New England steam buyers are as scarce as hen's teeth, and only those factors who have rehandling facilities of their own are in position to adhere to their asking prices of a fortnight ago. Shippers who have cargoes on hand at railroad wharves are forced to accept new low levels almost from day to day, and profits have gone by the board.

Accumulations are again the rule at the Virginia terminals. The agencies are therefore once again curtailing shipments to tidewater and at the time insisting upon prices that range from \$4 flat to \$4.25 per gross ton, f.o.b. vessel, even though on car figures at this end will net less than \$4 at Hampton Roads. Neither off-shore nor coastwise is there anything to warrant higher f.o.b. levels than now prevail.

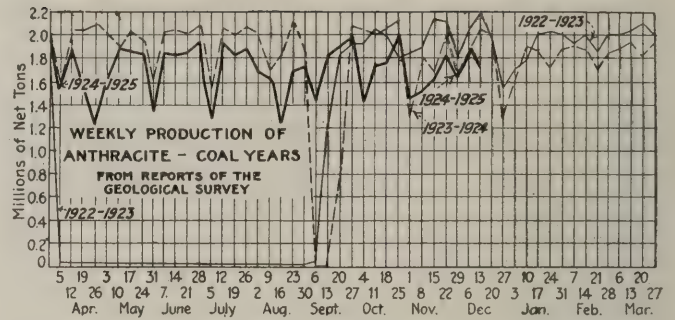
How the trade regards the 1925 outlook is reflected in bids submitted Dec. 15 for New Haven R.R. supply for the coal year 1925-6, as low as \$4.94 having been named alongside Boston for Kanawha coal and \$4.80 for coal from the Fairmont district. Both are coals taking a higher rate to Tidewater than Pocahontas and New River.

All-rail demand is no exception. The tonnage moving is light, and there are few signs of better business ahead.

### Interest Picks Up in Atlantic Markets

Activity at New York was fair during the week. Contract coal moved freely and consumers bought enough to meet current needs, inventory time being blamed for purchases not being heavier. Inquiries on contracts for next year are beginning to arrive and many are about ready to be closed. Railroads are buying good sized tonnages where the prices are right, but there does not seem to be any hurry otherwise. Tidewater coal moved slowly during the week. Receipts are heavy considering conditions, but prices remain steady.

At Philadelphia a little more interest has been shown in the trade recently. The business situation is improving, the trend in textiles continuing the good pace in evidence



since early November. The iron trade, however, shows the most satisfactory improvement, and is buying more coal. The railroads also continue to add to their piles. Gas slack is the only coal that is not equal to the demand. The continued shortage of orders for screened coal holds back the tonnage of fine coal, and prices usually are only quoted from day to day on it.

The Baltimore trade hails the passing of the old year, confident of improvement in respect to both gas and steam fuels. For a number of weeks the demand has been light and even the restricted output in excess of actual demand. This has meant an accumulation at both producing points and at tide, the latter in such cases where coals have been brought through in quantity on other than direct consignment. Increasing export trade to Mediterranean ports has given encouragement to that end of the business.

While there is no active demand in the Birmingham market, some new steam business is being booked, mostly in the open market, with a few contracts being negotiated recently. It is stated that the Mobile Light & Power Co., which has been using fuel oil for some time, will return to coal for power production. General industrial demand is slightly improved.

### Anthracite Trade Lacks Strength

Anthracite demand at New York has been rather weak and there has been more than enough coal to meet requirements. But for reduced output independent coals probably would be begging by this time. As it is quotations for the important coals are lower than last week. Chestnut has displaced stove as the leader in demand in the New York market, but this is partly due to increased peddler and cellar trades. One of the large companies has put on the market what is known as "special chestnut," consisting of a mixture of chestnut and pea. It is quoted at \$8.30 per gross ton f.o.b. mine. The situation with regard to stove has been eased considerably by the breaking down of egg coal by some operators. Pea and the steam sizes move slowly.

The Philadelphia market is not at all strong. Nut continues most in demand but stove is far from being sought after as it was a few weeks ago. There is hardly any demand for egg and all companies are breaking it down to smaller sizes. Steam coals are inclined to be draggy, and there appears to be more than enough to go around.

Domestic consumption at Baltimore has been at a minimum, and as a result dealers, while for the most part cautious not to overstock and tie up their money, are fairly well crowded with supplies and able to handle all possible demands rapidly. Dealers in some cases complain of poor preparation of coal by producers.

Anthracite trade at Buffalo is decidedly slack. The weather has not been cold enough to encourage buying and the prediction of a fierce blizzard in sight, bound this way, does not help matters. The sellers of independent anthracite agree that they are not doing much trade and their prices are not satisfactory. There is so much coke, oil, smokeless coal and natural gas to be had that the anthracite trade is pretty badly cut to pieces.

### Car Loadings, Surpluses and Shortages

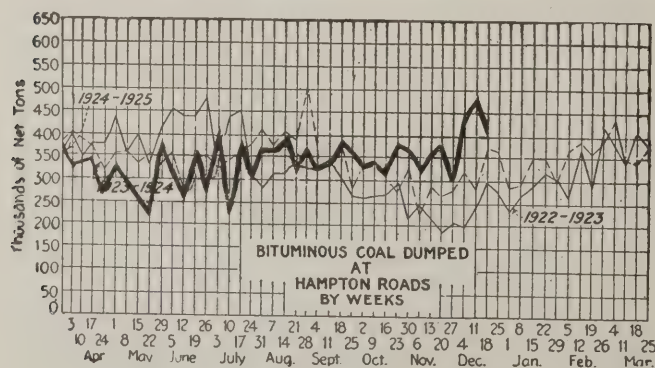
	Cars Loaded	
	All Cars	Coal Cars
Week ended Dec. 6, 1924.....	968,256	193,256
Previous week.....	878,631	172,033
Week ended Dec. 8, 1923.....	913,774	173,156

	Surplus Cars	
	All Cars	Coal Cars
Dec. 7, 1924.....	208,451	95,961
Nov. 30, 1924.....	183,914	82,819
Dec. 7, 1923.....	197,128	104,245

Car Shortage	
Dec. 7, 1924.....	.....
Nov. 30, 1924.....	.....
Dec. 7, 1923.....	.....





## Foreign Market And Export News

### British Market Improves in Tone; Price Level Firmer

The Welsh steam coal market has improved in tone and is steadier, though it is not certain whether this is to be taken as a definite all-round improvement or merely the result of overseas buyers seeking to place the balance of this year's requirements and so obtain shipment before the Christmas holidays. For several months buyers have been holding off the Welsh market and have used American and German competition with the view of forcing down Welsh prices. European stocks in consequence have attained a low level, and it is now generally recognized that no further reductions in Welsh prices are forthcoming. Shipments are heavier though still below normal and operators are getting slightly higher prices. No pits have reopened but those that had been working irregularly are now operating more consistently.

The Newcastle market also has im-

proved and inquiry has broadened out, the steam coals collieries having a clear program of work until the Christmas holiday. Gas and coking coals are pretty well booked.

A contract has been placed for 25,000 tons of Durham or Northumberland steams for the Swedish State Railways, shipment to be made from January to April. There are various other smaller contracts, mostly for gas coals, none exceeding about 5,000 tons. It is rumored that an Italian order for 750,000 tons of large coals has been placed at 24s. 6d. to 25s. 6d. f.o.b. Wales. The Dutch Ministry of Marine is asking tenders on 13,000 tons.

Production again advanced slightly, the output of the British collieries in the week ended Dec. 6, a cable to *Coal Age* states, being 5,336,000 tons according to the official reports. This compares with 5,303,000 tons produced in the preceding week.

### No Relief for Dullness in Sight In French Market

Little change is discernible in the French market, house coals being relatively quiet and the industrial coal market dull. Though holidays will help to reduce the output this month, imports from South Wales have been lower this week and French buying of German "free" coal is limited. Canal freight is steady at 25f., Béthune-Paris, and the rolling stock situation is normal.

In the first ten days of December the supply of Ruhr coke totaled 135,125 tons, a daily average of 13,500 tons. Last month's deficiency of supply is being partly covered this month. The price of indemnity coke is unchanged. With the exception of the Aciéries de Longwy, which were not part of the former association, all members of the O.R.C.A. have adopted a new status, which is expected to be signed at an early date.

During the first twenty-nine days of November France and Luxemburg received indemnity deliveries of 202,600 tons of coal, 213,300 tons of coke and 40,900 tons of lignite briquets, a total supply of 456,800 tons and daily average of 15,700 tons.

### Dullness Becomes General at Hampton Roads

Business at Hampton Roads is very dull, due chiefly to unusually warm weather, stopping of lake shipments and the general pre-holiday lull. The market has weakened somewhat, and the outlook for business before Jan. 1 is not bright.

Some foreign movement was recorded, but it was mainly on contracts which were being closed out. Bunker business has been fair, coastwise movement showing a decrease. Inquiries have slumped and large accumulations are piling up at the piers.

Reports from fields serving the port were that practically all coal operations, particularly those in West Virginia and southwest Virginia, would close down Dec. 20 and remain inactive until Jan. 2. Shippers looked forward to the closing of the mines in expectation of that action having a tendency to stimulate the market.

### Export Clearances, Week Ended Dec. 20, 1924

FROM HAMPTON ROADS	
For Africa:	Tons
Ital. Str. Giovanni, for Dakar.....	9,897
For Brazil:	
Ital. Str. Valnegna, for Rio de Janeiro	6,020
Br. Str. Innerton, for Rio de Janeiro.	6,624
Jap. Str. Holland, Maru for Rio de Janeiro .....	7,022
For Canal Zone:	
Amer. Barge Darien, for Cristobal.	7,224
Amer. Str. Ulysses, for Cristobal....	12,052
For Canada:	
Amer. Schr. B. S. Taylor, for St. Georges .....	1,024
For Cuba:	
Nor. Str. Dagfin, for Havana.....	3,145
Dan. Str. Phonix, for Cienfuegos...	3,010
For Dutch Guiana:	
San. Str. Silkeborg, for Paramaribo.	248
For West Indies:	
Jap. Str. Yone Maru, for Fort de France .....	8,018
Nor. Str. Marge, for Kingston.....	1,219

### FROM PHILADELPHIA

For Cuba:	
Br. Str. Redbird, for Havana.....	—
Br. Str. Peursum, for Antilla.....	—

### FROM BALTIMORE

For France:	
Br. Str. Ronda, for Marseilles.....	6,942
For Italy:	
Br. Str. Dunrobin, for Genoa.....	7,250

### Hampton Roads Pier Situation

	Dec. 11	Dec. 18
N. & W. Piers, Lamberts Pt.:		
Cars on hand.....	1,504	1,895
Tons on hand.....	98,697	123,389
Tons dumped for week.....	181,958	131,760
Tonnage waiting.....	10,000	10,000
Virginian Piers, Sewalls Pt.:		
Cars on hand.....	1,910	1,970
Tons on hand.....	130,550	132,300
Tons dumped for week.....	115,270	106,554
Tonnage waiting.....	6,474	9,194
C. & O. Piers, Newport News:		
Cars on hand.....	2,053	2,413
Tons on hand.....	92,893	120,450
Tons dumped for week.....	130,539	118,997
Tonnage waiting.....	4,505	21,495

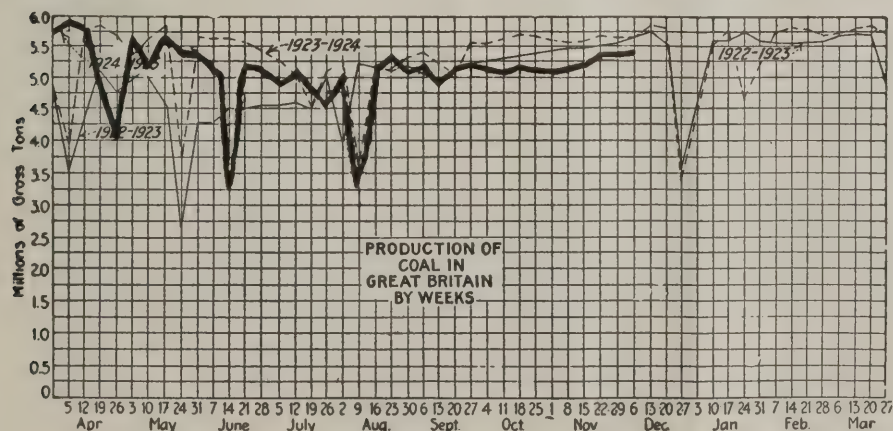
### Pier and Bunker Prices, Gross Tons

PIERS		Dec. 13	Dec. 20
Pool 9, New York....	\$4.75@ \$4.90	\$4.75@ \$5.00	
Pool 10, New York....	4.40@ 4.65	4.40@ 4.65	
Pool 11, New York....	4.20@ 4.45	4.30@ 4.75	
Pool 9, Philadelphia..	4.90@ 5.25	4.90@ 5.25	
Pool 10, Philadelphia..	4.45@ 4.70	4.45@ 4.70	
Pool 11, Philadelphia..	4.30@ 4.50	4.30@ 4.50	
Pool 1, Hamp. Roads.	4.15	4.10	
Pool 2, Hamp. Roads.	4.10	3.90	
Pools 5-6-7 Hamp. Rds.	4.00	3.95	
BUNKERS		Dec. 13	Dec. 20
Pool 9, New York....	\$5.00@ \$5.15	\$5.00@ \$5.25	
Pool 10, New York....	4.65@ 4.90	4.65@ 4.90	
Pool 11, New York....	4.50@ 4.70	4.55@ 4.70	
Pool 9, Philadelphia..	4.90@ 5.25	4.90@ 5.25	
Pool 10, Philadelphia..	4.75@ 4.95	4.75@ 4.95	
Pool 11, Philadelphia..	4.50@ 4.70	4.50@ 4.70	
Pool 1, Hamp. Roads.	4.25	4.20	
Pool 2, Hamp. Roads.	4.15	4.00	
Pools 5-6-7 Hamp. Rds.	4.10	4.10	

### Current Quotations British Coal f.o.b. Port, Gross Tons

Quotations by Cable to Coal Age		Dec. 13	Dec. 20†
Cardiff		27s. 6d.	27s. 6d.@ 28s.
Admiralty, large		20s.	16s.
Steam smalls....			
Newcastle:			
Best steams.....	18s. 6d.@ 18s. 9d.	18s. 9d.@ 22s. 6d.	
Best gas.....	22s.@ 22s. 6d.	21s. 6d.@ 22s. 6d.	
Best Bunkers.....	17s. 6d.@ 19s.	19s.@ 20s.	

† Advances over previous week shown in heavy type declines in italics.







## News Items From Field and Trade



### ALABAMA

According to the annual report just submitted to Governor Brandon by the State Board of Administration, the net earnings of state convicts employed in and around coal mines in Alabama last year were \$621,967.04. State convicts are employed in Flat Top, Belle Ellen, Banner and Aldrich mines, the three former being large operations. The prisoners are worked under the care and supervision of the state.

### IDAHO

The Equitable Coal Co., a Utah corporation, has been denied permission by the Idaho authorities to sell stock in that state. It was held that investors were not sufficiently protected in that an extravagant proportion of the stock is held out for promotion services. It also was held that the security of the company's property, consisting of 1,440 acres of coal land, was not satisfactory. "This application," said the Idaho commissioner, "discloses that the corporation is the holder of a lease of 1,440 acres, a part of which is subject to cancellation at any time by the Secretary of the Interior upon the failure of the lessor to comply with any of five or six conditions."

### ILLINOIS

The 1,400 inhabitants of Glen Carbon, dependent almost entirely on mine No. 2 of the Madison Coal Corporation, are happy. For nine months the mine failed to work a single day. Then without warning a message to resume operations came and on Dec. 15 the big whistle sounded, calling the miners to work. Thirty men were lowered into the shaft to clean up fallen debris and on Dec. 16 the machine runners started actual mining.

Harry Tanner and Charles Law, of Pana, have sold the Litchfield coal mine, at Litchfield, to John Puckett, of that city, for \$60,000. Temple McDonald, of Hillsboro, has been named manager and will reopen the mine.

Reports from the office of C. J. Nelson, general agent of the Chicago, Burlington & Quincy R.R. at Herrin state that October was the largest month in coal traffic this year. In October the road handled 1,150,040 tons of coal in a total of 23,047 cars.

Two new railroads will be constructed, if they are granted permission, in Franklin County, centering around Benton, the country seat. The Herrin-Benton Ry., which would operate from Herrin to Benton, and the Benton Northwestern Ry., which would operate

from Benton to McLeansboro, have both filed petitions with the Illinois Commerce Commission. They both will be operated by steam and the former will carry all classes of passengers, freight, etc., while the latter will handle freight traffic only.

William Cowell, mine manager of Bell & Zoller mine No. 2 at Zeigler, has resigned effective at once to accept a similar position with the Chicago, Wilmington & Franklin Coal Co.'s Orient No. 2 mine, at West Frankfort. Henry Taak, of Centralia, has been appointed to fill his vacancy in Zeigler.

The Gulf Mine at Sparta failed to pay off its regular bi-weekly payroll Nov. 30 and as a result the property is idle. According to reports the company was able to pay only about 25 per cent to the 250 men employed.

### INDIANA

Cairy Littlejohn, state mine inspector for Indiana, is in a serious condition at the Methodist Hospital, Indianapolis, following an operation for intestinal trouble nine days ago. His condition has become serious during the past few days.

Initiation fees in District No. 8, United Mine Workers, comprising virtually all the block coal field of Indiana, will be \$20 instead of \$10 after Jan. 1. This was decided at the recent convention held in Brazil. A rule also was passed by which persons who go to work in non-union mines or shops and afterward want to regain their membership in the union shall pay, in addition to the regular initiation fee, a fine of \$50, the fine to go to the local union.

### KANSAS

A class in mining has been organized at Arma with seventeen members, under the instruction of Obadiah Dray and the supervision of Prof. J. A. Yates, of the Kansas State Teachers College, to study mine gases, mine timbering, safety lamps and other subjects, a knowledge of which is necessary to pass the state mine examination.

The assessment of \$1 a week levied on members of District 14 (Kansas), United Mine Workers, for each week a member worked, for the relief of the unemployed, has been discontinued. On Dec. 1 the special fund showed a surplus of \$15,000 from the money paid in since June 1. At the same time that members of the district were notified that the one special assessment had been discontinued they also were informed that another assessment of \$1

a week for December and January had been levied for reimbursement of the general fund.

### KENTUCKY

The West Kentucky Coal Bureau's annual meeting and election will be held at Louisville Jan. 13. W. G. Duncan, of Greenville, is president.

The slow coal market at the present time and low prices in effect have resulted in operators of striking mines in western Kentucky losing interest in trying to get such mines running for the time being. So far there hasn't been much progress made in the Central City section, where the strike is now nearly eight months old.

A report from Barbourville is to the effect that core drilling with six out-fits has started on Henry Ford coal properties in eastern Kentucky, which were purchased from the Peabody Coal Co., in Clay and Perry County. Much of the acreage is off railroads and will have to be proved before opening. A good deal of it is alleged to contain small seam coal. However, there are 80,000 acres to be proved and some of this represents mighty fine coal land.

A. S. Bennett, secretary of the Workmen's Compensation Board, reporting to Governor Fields, on the board's activities for the year ending June 30, 1924, showed a total of 11,573 coal mine accidents out of a total of 28,133 accidents recorded. There were 27,569 males injured and 564 females. There were 15,447 agreements approved, involving payments of compensation amounting to \$1,459,637.62, and to injured employees or dependents of deceased employees \$303,638.64 was awarded.

### MASSACHUSETTS

The Massachusetts Special Commission on the Necessaries of Life, following an investigation of coal deposits in southeastern Massachusetts, has recommended to the State Legislature that an appropriation of \$50,000 be made to pay for an exhaustive investigation on the part of a special state commission into the quality as well as the commercial quantity of such coal available.

### MONTANA

Montana's coal output has slumped during the fiscal year 1924, along with that of most other states. The report of Inspector George N. Griffin, just out, shows that 3,035 men were employed, producing 2,988,799 tons. In Montana's banner year—1920—4,108 men produced 3,381,840 tons.



## NEW YORK

The first meeting of creditors of the Lake Erie Coal Co., Buffalo, was held Dec. 15 in bankruptcy court, when Rumsey Wheeler was appointed trustee and Frank Fitzpatrick attorney. No schedule was presented.

## OHIO

J. W. Richardson, general manager of the Splashdam Coal Co., of Splashdam, Va., was a recent visitor to Cincinnati equipment people concerning proposed betterments to the plant.

The Central West Coal & Lumber Co., of Columbus, will soon start the rebuilding of the tippie and power plant at Mine No. 24, near Jacksonville, Athens County, on the T. & O. C. R.R. which was destroyed by an explosion several weeks ago. Machinery for a shaker screen, picking table and loading boom will be ordered soon and work of construction will be pushed. Nothing definite has been discovered as to the culprits causing the explosion. Mine No. 68, nearby which was slightly damaged at the same time, has been in operation almost continuously since the disaster. The loss was in the neighborhood of \$50,000 and that amount will be expended on the new plant. It is planned to use loading machines in the mine when reopened as four such machines are now being used in Mine No. 68.

Federal court has approved an order for the sale of the three Ohio mines of the Maynard Coal Co., located in the Pomeroy field, at auction at Pomeroy, Meigs County, Jan. 7. At the same time an order was issued for the sale of the three mines in the Hazard field, Kentucky, at Hazard, Perry County, Jan. 10. In each field there are three mines, all well equipped. The capacity of the three Kentucky mines is about 3,000 tons daily and that of the three Ohio mines about 1,500 tons daily. William S. Haman and Frank L. Stein, of Columbus, are the receivers.

Following the return of the Hazard Jellico Coal Co., which was operated by Jewett, Bigelow & Brooks prior to the bankruptcy proceedings, to the Harvey

Coal Co., its original owners and from whom it was purchased on a payment plan, a new corporation has been formed with C. H. Harvey, president; F. L. Fisher, vice president, and Fritz Staub, secretary and treasurer. This will be known as the Harvey Coal Corporation and it is now in full charge of the operations at Harvettown, Ky.

Suit has been brought by the Essex Coal Co., of Columbus, against the Northern Fuel Co., of Toledo, asking for the appointment of a receiver for the Toledo company. The claim is made that there is an unpaid judgment.

## PENNSYLVANIA

The John Mitchell Mutual Life Insurance Co. has elected officers and will start the issuance of policies on Jan. 1. It is a United Mine Workers organization, although independently controlled. J. J. Helferty, of Hazleton, has been elected president. The first policy will go to Chris Golden, of Shamokin, president of District 9, United Mine Workers, whose efforts in behalf of the concern have figured prominently in its successful organization.

The Lehigh Valley Coal Co. has declared an initial dividend of \$1.25, payable Jan. 31 to certificate holders of record Jan. 15.

Michele Bassi and Tony Pezzi, alleged bandits who shot and killed an express company guard during the holdup of a train carrying the payroll of the Ebensburg Coal Co. at Raxis, near Colver, on Oct. 11, and who got away with more than \$33,000, have been convicted of murder in the first degree in the Cambria County courts. A third member of the gang, Pete Antonucci, will be tried in January. The men were stopping at a hotel in Terre Haute, Ind., when arrested. The automobile used in connection with the holdup proved to be the one used in the holdup of the East End Coal Co. payroll of \$70,000 on July 30 in Lackawanna County. The verdict carries with it the death penalty under the Pennsylvania laws.

A deal has just been closed whereby Dr. John P. Hagg, of Williamsport,

becomes the owner of a piece of coal land in Karthus township, Clearfield County. Both the coal and surface rights are included in the deal. There are three veins of coal on the tract, some 6 ft. thick. It is estimated that the territory purchased will produce several million tons of coal. The land adjoins the holdings of the Snowshoe Independent Coal Co., of which Dr. Hagg is president. A railroad siding has just been completed to the company's holdings.

## TENNESSEE

The J. G. White Corporation is understood to have effected a combination of several large coal and iron ore properties, blast furnaces and similar plants in the Chattanooga district. The total involved is reported to be between \$8,000,000 and \$10,000,000. Among the companies said to be involved in the merger are the Roane Iron Co., the Tennessee Consolidated Coal Corporation, the Bon Air Coal Mines, the Chattanooga Coke & Gas Co. and the Chattanooga Iron Co.

## UTAH

The Blazon Coal Co., of Salt Lake City, a mining concern, has been granted a permit to offer for sale 94,801 shares at \$1 per share.

The Independent Coal & Coke Co. has filed suit against the Receiver of the Denver & Rio Grande Western R.R. for \$2,254, alleged to be due for losses sustained through fire caused by the railroad's negligence. It is claimed that the coal company lost the amount mentioned in lumber and wooden pipe as a result of a fire caused by sparks from the engines of the railroad.

Zeth Thomas, superintendent at Castlegate for the Utah Fuel Co., has resigned and gone to St. George, in southern Utah, where he will make his home for the winter. He will be succeeded by Mine Supt. T. A. Stroup, of the Clear Creek group of mines. Mr. Stroup will be succeeded by J. W. Littlejohn, chief inspector of the company's property at Sunnyside, and a brother of General Supt. William Littlejohn.

## VIRGINIA

Ira Cochran, commissioner of the American Wholesale Coal Association, Washington, was the guest of the Hampton Roads Coal Association and the Norfolk Wholesale Coal Association last week. He addressed the association on the subject of the operations of his association, and inspected the coal terminals.

## WEST VIRGINIA

The American Coal Co. of Alleghany, for the ten months ended Oct. 31, 1924, reports net earnings of \$208,117 after depreciation but before taxes, which compares with net earnings for the year ended Dec. 31, 1923, of \$915,000.

The Goodwill Coal & Coke Co., operating in Mercer County, in the Pocahontas district, has virtually completed



Courtesy Bertha-Consumers Co.

## Playground at Rachel Mine

If fresh air and fun make healthy and happy children, then the younger generation in the vicinity of Downs, W. Va., where this operation of the Bertha-Consumers Co. is located, need no commiseration, for their wants have been well provided for by the coal company.



extensive repairs and alterations to its tippie. The mine of the company is one of the oldest in the Pocahontas section. About 600 men were idle for two weeks while the changes were being made.

The supply tippie of the Elk Lick Coal Co., near Richwood, recently was destroyed by fire. The Elk Lick mine is owned by the Cherry River Boom & Lumber Co.

Preparations are being made by A. J. Thompson and associates, of Titusville, Pa., to install a plant near Flint, on the Durbin branch of the Western Maryland Ry. Tests have indicated the existence of the Sewell seam with a thickness of about 42 in., over an area of from 600 to 800 acres. The coal found by tests shows a little better analysis than the New River coal found in Rich Mountain. Between \$25,000 and \$30,000 will be expended in preliminary development work under the direction of Oren Kelly.

Fire, believed to have been of incendiary origin, recently entirely destroyed the Recreation Hall at the Grant Town operation of the New England Fuel & Transportation Co. The building together with its contents was valued at \$20,000. It was impossible to save the building or any of its contents and a force of volunteer firemen devoted their efforts toward saving adjoining buildings. The building contained bowling alleys, pool tables, a moving picture theatre, club rooms and all the necessities for a community center. The fire followed shortly on the heels of a rumor that the recreation hall was to be used as a rooming house.

The Marshall Coal Co., operating at Mt. Clare, in Harrison County, sustained a loss of about \$1,000 when six mine dwellings were destroyed by fire, the blaze starting as the result of a defective flue in dwelling No. 3.

The Bethlehem Mines Corporation, a subsidiary of the Bethlehem Steel Corporation, resumed operations Dec. 15 on an open shop basis at its Dakota mine, in Marion County one of the largest mines in northern West Virginia. The mine had been closed down since April 1, when the company declined to sign the Jacksonville agreement. The Dakota mine has a capacity of from 40 to 50 cars a day. Although the mines of the Bethlehem company on the Morgantown & Kingwood have been operated open shop for some time, the Dakota and Barrackville mines acquired from the Jamison Coal & Coke Co. were operated as union mines up until April 1.

## WISCONSIN

A court order has set Jan. 5 as the date at which the Reeves coal dock at Superior, will be sold. The property of the company in the Twin Cities also will be sold. It is rumored that the president of the company will endeavor to get together enough capital to buy the Superior dock, in accordance with former plans announced some months ago. It is definitely stated that Henry Ford is not interested in the defunct company.

## CANADA

Carbon, Alta., on the Canadian Pacific Ry. in the southern part of the province, promises to develop into a mining town of considerable importance within the next few months. The Carbon Coal Co. has obtained extensive concessions and, according to a statement of H. Ransford, South Wales capital has been interested in the venture and work will be begun on a large scale immediately negotiations have been completed.

A readjustment of duties on United States coal so as to afford adequate protection to the coal industry of the Maritime Provinces and a careful investigation of the tariff on coal and semi-finished steel products was urged by a delegation headed by Premier Armstrong of Nova Scotia which waited upon the Federal Government at Ottawa last week.

T. J. Brown, Deputy Minister of Mines of Nova Scotia, has notified Malcolm Blue, general manager of the Nova Scotia Steel & Coal Co. that the company cannot continue to have policemen and watchmen tend the fans in the Albion mine near Stellarton. They must be replaced by members of the United Mine Workers according to the decision of Mr. Brown, whose attention was called to the situation by Thomas Scott, district board member of the miners' union for the Pictou territory.

Norman Harvey, acting on behalf of the Vancouver Harbor Commission, has just completed a survey of coal deposits in Alberta province in connection with a report to be issued in the near future by that body. The commission intends to classify the coals of Alberta and British Columbia under their respective heads and review the feasibility of marketing certain kinds through Vancouver port.

The Northern Alberta branch of the Canadian Institute of Mining and Metallurgy has elected the following officers for the ensuing year: Norman Fraser, chairman; David Jones, vice-chairman; H. M. Roscoe, secretary; L. C. Stevens, treasurer, and an executive committee composed of K. Campbell, A. C. Dunn, T. Hollies, J. W. Cashmas and J. A. H. Church.

Ninety days of work on a site alongside the Alberta Coal Branch of the Canadian National Ry. has resulted in the birth of a new mining town to be called Bryan, Alta., from which coal is already being shipped. Since the middle of September a tippie and power house have been built, nearly a mile of railway, with three switches constructed and a 325 ft. shaft sunk to the coal. The mine has an anticipated output of 1,000 tons a day. Officials in charge of the new mine are as follows: James H. Bryan, president; Charles Robertson, vice-president; John R. Macdonald, general manager and superintendent; Colin McGillivray, master mechanic, and Fred McKenzie, accountant.

Owing largely to the strike last summer the year's coal production in Alberta will not equal that of the previous year. Figures recently issued show a

total output of 6,866,923 tons during 1923 and a total of 3,589,884 up to the end of October of the present year.

"No evidence whatever was adduced at the inquiry to support the theory of a combine among either Winnipeg coal dealers or Alberta operators," declared Howard Stutchbury, Trade Commissioner for Alberta, on his return from Winnipeg, where he spent two weeks attending the government investigation into alleged conspiracies to keep up the price of coal in the prairie city. The inquiry was begun at the instigation of A. B. Hudson, a Winnipeg coal dealer who professed knowledge of a combine in that city, which he thought was preventing him from buying Alberta coal as he wished.

## New Companies

**The Canyon Coal & Lumber Co.** has been incorporated in Salt Lake City, Utah, by H. E. Havenor, as president; Chas. Kelby, as vice-president, and Alta Snyder, secretary-treasurer.

**The Trumbull-Warner Coal Co.**, Cleveland, Ohio has been incorporated with a capital of \$100,000 to mine coal and deal in coal and coke. Incorporators are Norman A. Emery, Charles F. Ohl, T. Lamar Jackson, Donald J. Lynn and C. Kenneth Clark.

**The Storm King Fuel Co.**, Hazard, Ky.; capital \$25,000, has been chartered by William F. Mandt, Lewis E. Harvie, W. W. Reeves and P. T. Wheeler.

**The Green Coal Co.** has been formed to operate at Madison, in the Boone County field of West Virginia. This company is capitalized at \$100,000. Principally interested in the new concern are: E. J. Goodrich, D. W. Hill, H. D. Battle, H. B. Stubbs and D. C. Howard, all of Charleston.

**Canadian Amalgam Fuel Co., Ltd.**, of Windsor, Ont., has been incorporated with a capital of \$40,000, to manufacture and deal in fuel. Robert McDonald, Fred A. Brandt and S. G. Bawden are provisional directors.

## Publications Received

**Miners' Wages and the Cost of Coal**, by Isador Lubin. Pp. 320; 5½x8 in. Price, \$2.50. An inquiry into the wage system in the bituminous-coal industry and its effects on coal costs and coal conservation. The book analyzes the peculiar wage system that has been developed in the bituminous field and shows how this system has affected the earnings of the miners, the cost of producing coal and the exploitation of our coal resources. McGraw-Hill Book Co., Inc., 370 Seventh Ave., New York City.

**Mechanical Engineers' Handbook**—New second edition, by Lionel S. Marks. Pp. 2,000; 4½x7 in.; illustrated. Price \$6. A thorough revision of this handbook. All the material has been brought up to date and much new material included. McGraw-Hill Book Co., Inc., 370 Seventh Ave., New York City.

**Annual Report of the Mines Branch of the Province of Alberta, Can., for 1923.** Pp. 339; 6x9 in.; tables.

**Flame Safety Lamps**, by J. W. Paul, L. C. Illsley and E. J. Gleim, Bureau of Mines, Washington, D. C. Bulletin 227. Pp. 212; illustrated. Price, 50c. Gives detailed account of development of present safety lamps from those of Davy and Stephenson; discusses lamp-testing stations and tests made by various governments and by the U. S. Bureau of Mines; also describes devices and methods for testing for methane in mine air.

**Arc Welding Handbook**, by C. L. Holslag. Pp. 243; pocket size; illustrated. Price \$2.00. McGraw-Hill Book Co., 370 Seventh Ave., New York City. Complete working manual for welding operators and those who supervise welding jobs.



## Association Activities

The fifteenth annual convention of the **Winding Gulf Operators' Association** was held at the Hotel Washington, Beckley, W. Va., on Tuesday, Dec. 16. Routine business in connection with trade conditions, tonnage, production and the market situation were given special attention. The officers elected for the ensuing year are: E. E. White, of Glen White, president; P. M. Snyder, of Mount Hope, vice-president; George Wolfe, of Beckley, secretary, and A. W. Laing, of McAlpin, treasurer. W. A. Richards was made a member of the executive committee in place of W. A. Ruby, resigned. Among those attending the meeting were: G. P. Caperton, of Charleston; F. M. Lee, of Alpoca; W. A. Richards, of Ashland; W. B. Beale, of Fireco; L. Epperly, of Winding Gulf; C. H. Mead, of Beckley; T. H. Wickham, of Beckley; Fred G. Wood, of Amigo.

## Trade Literature

The Ohio Electric & Controller Co., Cleveland, Ohio, recently issued Bulletin 204, describing the **Ohio Fractional Size A.C. and D.C. Motors**, 12 pp., and the **Ohio Motor Application Bulletin**, 12 pp. Both bulletins are 6x9 in. and illustrated.

**Footo IXL Speed Reducers.** Footo Bros. Gear & Machine Co., Chicago, Ill. Catalog No. 24. Pp. 14; 8x11 in.; illustrated. Describes the construction and use of reducers to reduce the speed of electric motors.

**Westinghouse Fittings for Pipe Structures.** Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. Circular 1676. Pp. 35; 8x11 in.; illustrated. Describes interchangeable pipe fittings for structural work, giving their application to erection of outdoor substations, switching equipment, switchboard frames, etc. An adjustable insert for fastening machinery or other equipment to concrete floors, walls or ceilings is also illustrated and described.

The Westinghouse Electric & Mfg. Co. recently issued a 16-page booklet, 4x7 in., entitled **Westinghouse Precision Instruments**, devoted to the construction, operation and performance of precision voltmeters, ammeters and wattmeters. The booklet is known as Folder No. 4603.

Allen-Bradley Co., Milwaukee, Wis., recently issued the following: Bulletin 600, alternating-current resistance starters. Bulletin 640, type H-1852, semi-automatic resistance starter. Bulletin 740, type J-3052, automatic resistance starter. Bulletin 720, type J-1552, across-the-line starting switch.

**The Economy of Better Lubrication.** McCord Radiator & Mfg. Co., Detroit, Mich. Pp. 22; 8x11 in.; illustrated. Descriptive of the company's Class B lubricator, adapted to small steam engines, oil engines, gasoline engines, air compressors, steam pumps and auxiliaries. Over-all dimensions and price lists are included. This company has also issued Class BA catalog, describing the lubrication of steam shovels, cranes, dredges, hoisting engines and coal-and ore-handling apparatus.

**Coal and Ash Handling Machinery.** The Jeffrey Mfg. Co., Columbus, Ohio. Catalog No. 385. Pp. 212; 8x11 in.; illustrated. This book is composed of thirteen sections. No. 1 is devoted to pivoted bucket carriers. No. 2 to V-bucket conveyor. No. 3, bucket elevators; No. 4, power-house weigh laries; No. 5, track hoppers, plate feeders and bin valves; No. 6, scraper conveyors; No. 7, belt conveyors; No. 8, Steel apron conveyors; No. 9, pan and spiral conveyors; No. 10, skip hoists; No. 11, crushers; No. 12, coal-storage equipment; No. 13 mechanical draft fans. Typical layouts giving general dimensions accompany the tables of specifications for various equipments.

**Universal Conveyors.** Universal Conveyor Co., South Bend, Ind. Catalog C. Pp. 23; 8x11 in.; illustrated. Monorail and cableway conveyors as a solution of the dealers' coal-handling problems are described.

**Marion Model 350.** Marion Steam Shovel Co., Marion, Ohio. Bulletin 314. Pp. 35; 8x11 in., illustrated. The Model 350 shovel and Model 360 dragline, equipped for either steam or electricity, are fully described. Among the latest developments for the new

Marion is the patented method of equalizing and leveling by hydraulic jacks.

Roberts & Schaefer Co., Chicago, Ill., recently issued bulletin No. 59, illustrating and describing **Marcus coal tipples**. The bulletin contains 6 pp. and measures 8x11 in.

**Sullivan Air Lift Pumping Systems.** Sullivan Machinery Co., Chicago, Ill. Bulletin 71-H. Pp. 47; 6x9 in.; illustrated. The different installations in which these systems are employed are described.

**Interlocking Safety Switch and Plug.** Crouse-Hinds Co., Syracuse, N. Y. Fourteen-page folder illustrating the use of safety switches and plugs with portable electrical appliances.

**Arcwall Coal Cutter.** The Jeffrey Mfg. Co., Columbus, Ohio. Bulletin No. 406, Pp. 8; 7½ x 10½ in. illustrated. Describes the principal advantages of the arcwall coal cutter and its methods of operating.

## Recent Patents

**Caging Apparatus;** 1,490,006. Daniel F. Lepley, Connellsville, Pa. June 3, 1924. Filed Oct. 22, 1921; serial No. 509,652.

**Hoist Skip;** 1,496,007. Daniel F. Lepley, Connellsville, Pa. June 3, 1924. Filed Aug. 31, 1922; serial No. 535,540.

**Coal Drill;** 1,496,153. Edward J. Dooley, Peoria, Ill., assignor to Dooley Bros., Peoria, Ill. June 3, 1924. Filed May 17, 1922; serial No. 561,573.

**Mining-Machine Bit;** 1,496,203. Newton K. Bowman, North Lawrence, Ohio. June 3, 1924. Filed Jan. 26, 1921; serial No. 440,120.

**Method of and Apparatus for Transporting Materials in a Mine;** 1,496,196. E. G. Auld and G. E. Huttie, Scottsdale, Pa. June 3, 1924. Filed Feb. 3, 1922; serial No. 533,775.

**Miner's Safety Glowlamp;** 1,496,261. L. E. F. Ferrette, Paris, France. June 3, 1924. Filed Feb. 17, 1922; serial No. 537,295.

**Mine Car;** 1,496,339. Wilbur D. Hockensmith, Irwin, Pa., assignor to Hockensmith Wheel & Mine Car Co., Penn. Sta., Pa. June 3, 1924. Filed April 24, 1923; serial No. 634,262.

**Coal-Loading Machine;** 1,496,513. Newton L. Barger and James H. Ford, Brae-holm, W. Va. June 3, 1924. Filed March 17, 1921; serial No. 453,005.

**Mine-Car Coupling;** 1,496,553. Mike Meerdo, McDonald, Pa., assignor of one-half to Wm. Ash, McDonald, Pa. June 3, 1924. Filed July 16, 1920; serial No. 396,833.

## Coming Meetings

**American Engineering Council.** Annual meeting Jan. 16-17, 1925, Washington, D. C. American Engineering Council, 29 West 39th St., New York City.

**Northeast Kentucky Coal Association.** Annual meeting Jan. 22, 1925, Ventura Hotel, Ashland, Ky. Secretary, C. J. Neekamp, 816 Ashland National Bank Bldg., Ashland, Ky.

**American Management Association.** Annual convention, Jan. 28-30, Hotel Astor, New York City. Managing director, W. J. Donald, 20 Vesey St., New York City.

**American Wood Preservers' Association.** Twenty-first annual convention, Feb. 3-5, Congress Hotel, Chicago, Ill. P. R. Hicks, secretary, Service Bureau, 1146 Otis Building, Chicago, Ill.

**American Institute of Electrical Engineers.** Midwinter convention, Feb. 9-13, 1925, 29 West 39th St., New York City. Secretary, F. L. Hutchinson, 29 West 39th St., New York City.

**Northern West Virginia Coal Operators' Association.** Annual meeting, Feb. 10, Fairmont, W. Va. Executive vice-president, George S. Brackett, Fairmont, W. Va.

**American Institute of Mining and Metallurgical Engineers.** Annual meeting, Feb. 16-19, 1925, 29 West 39th St., New York City. Secretary, F. F. Sharpless, 29 West 39th St., New York City.

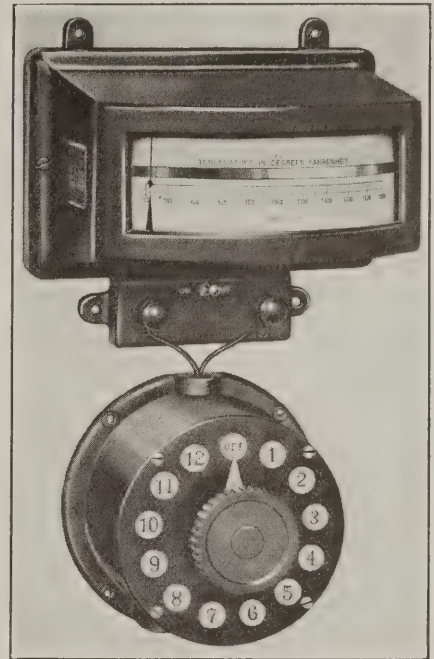
**New England Coal Dealers' Association.** Annual meeting, March 25-26, Springfield Auditorium, Springfield, Mass. Secretary, C. R. Elder, 141 Milk St., Boston, Mass.

## New Equipment

### Electric Pyrometers Record Clear Indications

A complete line of indicating and recording pyrometers, together with the usual thermocouple accessories, was recently placed on the market by the Republic Flow Meters Co., of Chicago, Ill.

The clock of the pyrometer has a complete time element with the usual escapement and its own main spring. It performs no other function than to



Wall-Type Indicating Pyrometer

A long scale is provided on the meter so that indications are clearly visible. Outside adjustments are made on a moisture-proof twelve-point rotary switch.

release operating energy periodically through the second or power escapement. No power passes through the timing escapement, and as a consequence the timing is not influenced by the quantity of reserve power that remains in the springs. The clock is an excellent time keeper.

In the recording type pyrometer two independent charts are used. With two separate sheets of paper, it is possible to have any combination of scale ranges desired. Six-inch charts are used on the duplex recording pyrometer. The actual scale range is 5½ in.

A tear groove below the driving drum permits extraction of the record instantly without waste of chart paper. A clutch on each driving drum enables one to operate either or both charts at will. The charts last 1,200 hours.

A carbon ribbon is automatically advanced across the face of the chart, and the instrument pointer moves freely between a depressor bar and the back of this ribbon. The pointer deflects in proportion to the temperature at the hot junction of the thermocouple and there is no frictional resistance at



the pointer. Just before the depressor bars come down, the carbon ribbon moves forward, covering the knife edge which runs the width of the charts and is located directly beneath the depressors.

When the carbon has advanced to cover the knife edge, the depressors drop, and a dot is made on the face of the chart. The depressors then rise, the carbon drops back, and the dot that has just been made is visible. In some instruments visibility is attained by having the carbon marking band on the under side of the chart, but this is not as satisfactory. All the charts used in these pyrometers have 20 deg. F. markings at each division. This is true even with the 3,000 deg. F. charts.

All the parts in the recording pyrometer are mounted on a swinging bracket. Every detail is visible and accessible. The bracket also forms a cover for the electric system which is attached to the back of the bracket. Two screws hold the bracket closed and the electric system is thereby thoroughly protected.

Fifty ohms' resistance is taken from the fixed resistor and placed in a variable rheostat having a scale of 25-0-25 ohms. These instruments are accurately calibrated for the external circuits stipulated, but if at any future time it is necessary to change the length of the extension leads, instantaneous and accurate adjustment can be made within the instrument.

A small toggle switch, which is plainly marked "on and off," is built into the instrument, which, when closed, short-circuits the magnetic field and damps the movement of the pointer when in transit. The meters have high resistance which assures accurate reading.

### Compressor Has Improved Type Governors

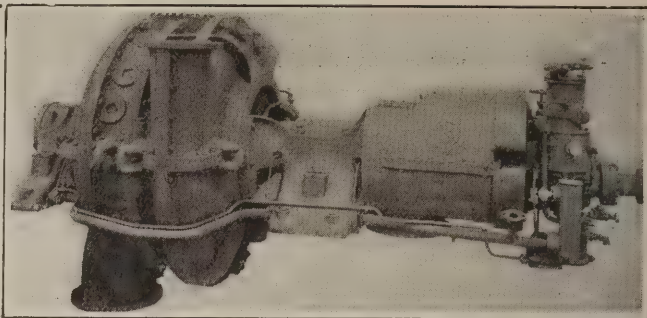
A new type multi-stage, centrifugal compressor, designed to supplement the line of single-stage machines recently developed, and supplied with improved control devices, is now being marketed by the General Electric Co. These compressors have been especially developed for furnishing various volumes at higher pressures than ordinarily obtained with single-stage machines. Compressors of this type are particularly suitable for pneumatic materials, handling systems, the agitation of liquids and drill machines.

The main line of compressors covers water-cooled machines designed to deliver volumes of from 3,000 to 60,000 cu.ft. per minute, at pressures up to 30 lb. or more. Two types of miniature, self-cooled machines, to deliver from 250 to 1,400 cu.ft. per minute, at pressures of from 2 to 6 lb., have been included in the group. All types are either motor or turbine driven.

Among the advantages claimed for the new compressors are higher efficiencies, simpler and stronger construction, thus minimizing mechanical difficulties. The large cooling capacity is expected to bring about greater efficiency, the conversion passages having been improved and the interstage passages simplified. Each complete unit has four bearings with an automatically lubricated flexible coupling. These

### Compressor Improved

This well-balanced compressor unit can deliver 3,500 cu.ft. of air per minute at a pressure of 17 lb. It is suitable for air hammer drills and is equipped with improved type pressure governors.



bearings are supported by the foundation or base under the machine. In addition to these changes, all the various governing devices for these machines have been improved, including constant-volume governors, constant-suction governors, constant-pressure governors, etc.

### Compact Ribbon Resistor

A ribbon-type resistor, wound on edge, has recently been developed by the Monitor Controller Co., Baltimore, Md. It is intended for service where cast-iron grids would otherwise be employed.

The resistor unit consists of a high-resistant alloy ribbon wound on edge in helical form and mounted on a steel-reinforced porcelain support which passes through the entire length of the unit and also supports and separates each convolution at two diametrically opposite points. This method of construction relieves the resistor ribbon from mechanical strain and permits thorough ventilation. The ribbon can

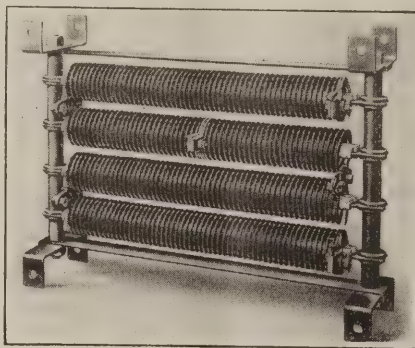


Fig. 1—Units Are Compact

Bank of four resistor units connected in series and stood on edge with feet turned outwards to show details of construction. There are only three joints in the whole bank, these being made by bridging clamps at the ends of the unit.

operate at any temperature up to red heat without sagging or in any way injuring the resistor as a whole.

By means of terminals and taps a unit may be connected into a circuit or interconnected with other units. Two simple forms of clamps provide all these facilities. One is a bridging clamp which makes solid mechanical connection between two adjacent units as shown in Fig. 3, and which serves as a terminal when the units are connected in parallel and also as an end tap, if desired, when the units are connected in series. The other may be used for either of two purposes—as a terminal clamp or as shown in Fig. 2. The taps may be placed at any desired point along the resistor and may be changed at will.

As the clamps may be used to join ribbons of different sections together at any point, tapered resistors of almost perfect design can easily be made.

The resistors are made in standard units and mounted in frames so that they can be applied in a manner similar

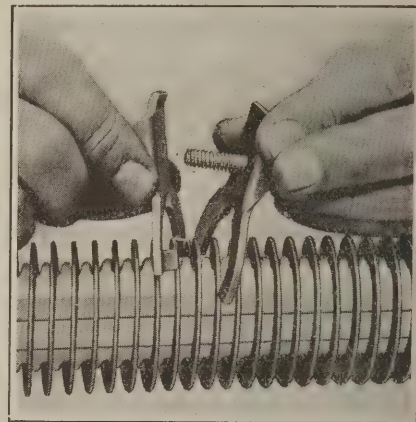


Fig. 2—How Taps Are Made

Clamp used for taking off tap. Same clamp is also used for effecting terminal connections.

to cast-iron grids. The standard section will contain either four or six units mounted horizontally and connected either in series or in parallel. Any number of these sections may be mounted one on top of another. It makes practically no difference whether the resistor as a whole is mounted with the units in a vertical or horizontal position. There are no joints in a resistor section except at the terminals. The ordinary cast-iron section has approximately fifty joints in addition to those at its terminals.

The porcelain used in the resistor being supported by steel is practically unbreakable.

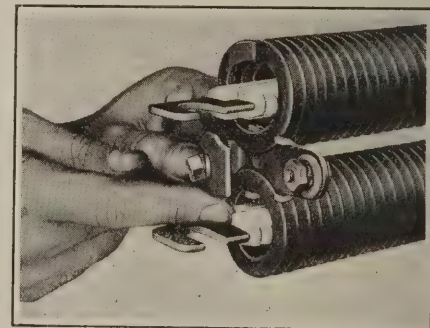


Fig. 3—Joining Sections

This type clamp is used for connecting adjacent units in parallel or series. It serves as terminal when units are in parallel, but also may be used for taking off intermediate taps whether units are in parallel or in series.



# COAL AGE

With which is consolidated "The Colliery Engineer"

McGraw-Hill Co., Inc.

*The World's Accepted Authority on Coal Mining*

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December 25, 1924



CARS mounted on Timken Tapered Roller Bearings are strangers to the repair shop. There is never a long string of cars on the repair siding—when a peak day finds you needing every car you can lay your hands on.

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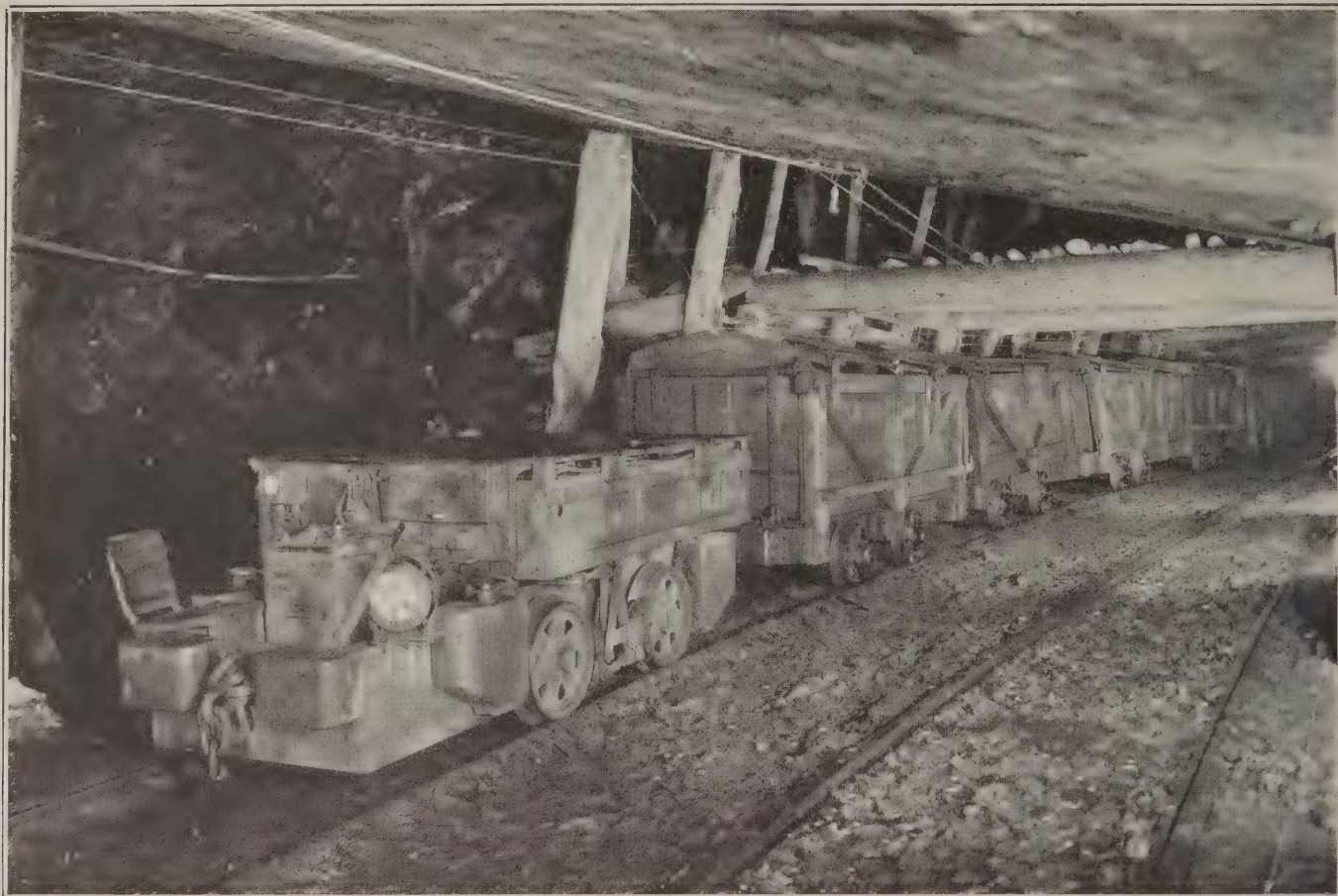
The booklet "Timken Bearings and Coal" gives all the details.

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*An Exide-Ironclad Battery equipped locomotive in Kehley's Run Colliery, a subsidiary of Madeira, Hill & Co.*

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## We Wish You A Merry Christmas

This day of all the year is full of good cheer and gratefulness, so chockful of happiness that we look forward to it as to an oasis in a desert, where we can take our fill of water from the well and dates from the lofty trees to sustain us through another year's journey.

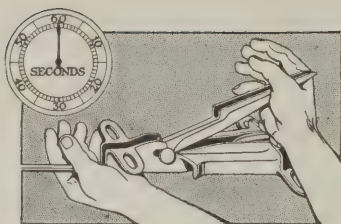
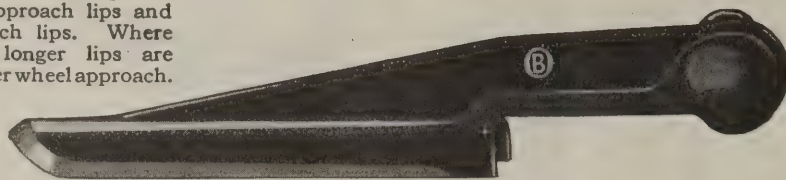
But there should be no deserts. They are largely of our own making. The song of life should run along steadily year in and year out, only with a deeper, fuller note at Christmas.

Men arrive at their goals as much by being as by planning. Inspiration to our friends and associates to help and serve us comes not so much by the depth of our thought to please as by the cheerfulness and friendliness of our character. If we put the briskness and freshness of Christmas day into our daily lives the seven devils of suspicion, dislike, fear, resentment, ungratefulness, anxiety and mental inertia will be driven out.

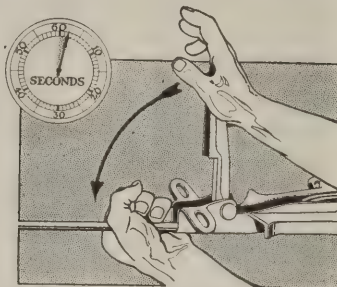
He who carries good cheer into his life has not only a good digestion for his food but a wholesome solution for his problems. He who is uninfluenced by imaginary wrongs and ills and unhampered by a gripful of unpleasant memories finds that despite many a discordant note the song of life is attuned always to his.



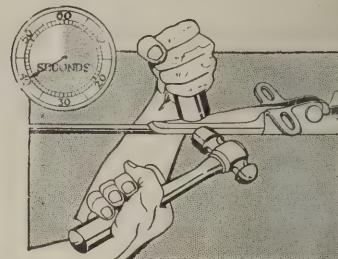
O-B Renewable Bronze Cam Tips are made with 6-inch approach lips and with 2½-inch approach lips. Where space permits the longer lips are recommended for easier wheel approach.



**1** The tip is inserted, up-side-down, under the hooks cast on the frog body.



**2** It is raised up, over and down onto the wire. The cam end forces wire down into groove.



**3** The lips are clinched around the wire, the whole job on one tip taking about 40 seconds. No nuts or bolts required.

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Try a Type D or a DM Frog at a heavy traffic point.



O-B Type DM Frog

2½- or 6-inch Cam Tips are interchangeable on all Frogs.

These two frogs are popular ones for mines. The DM is good for short radius curves as it is short enough to allow quick turnouts. The D makes a smoother passage for the trolley wheel and is recommended where track curve radius will permit.



O-B Type D Frog

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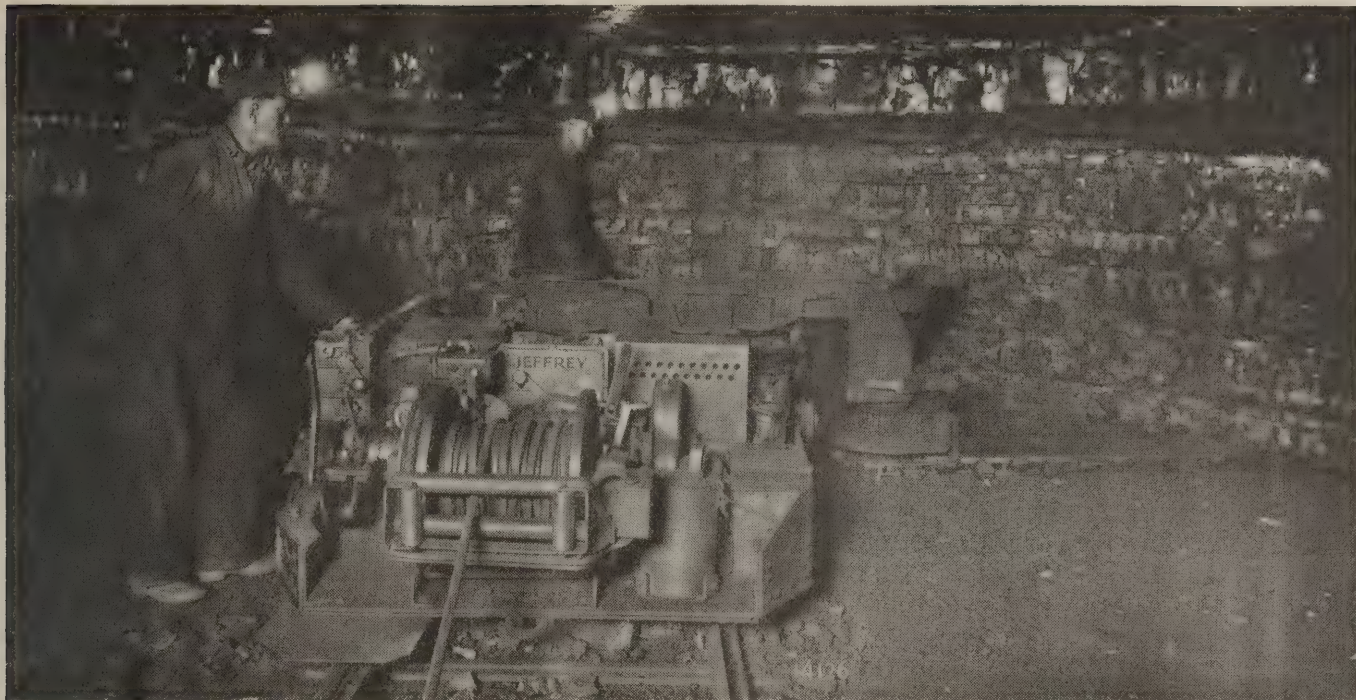
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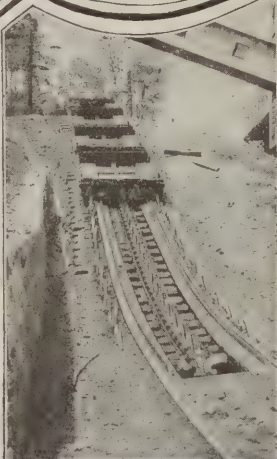
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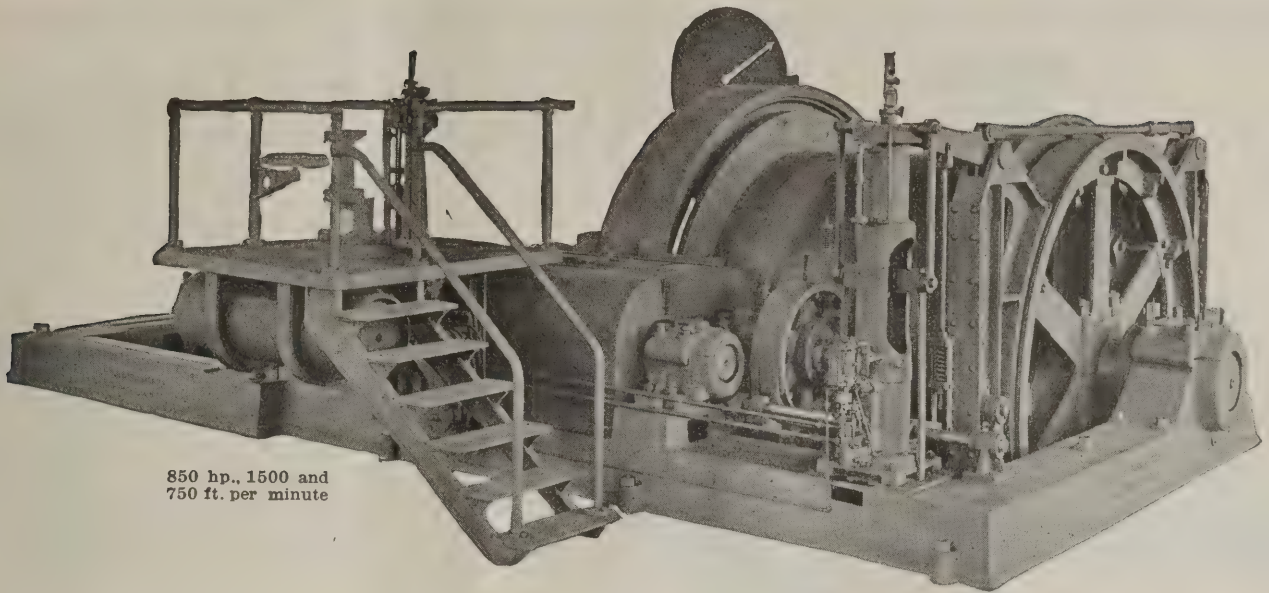
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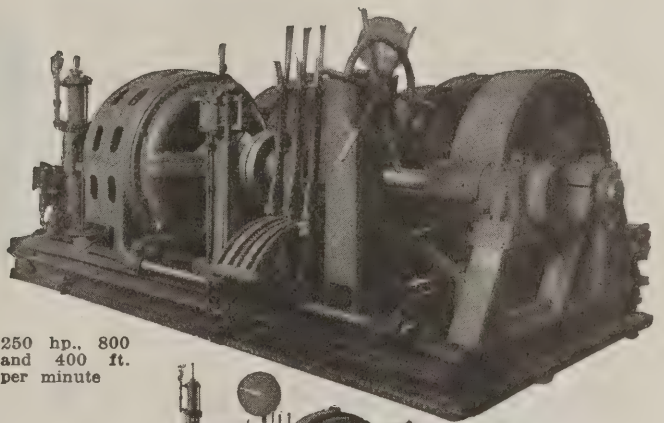
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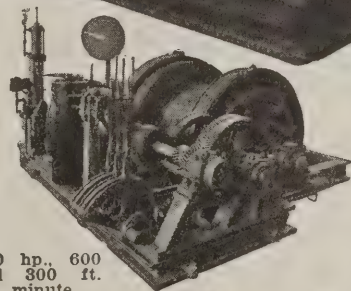
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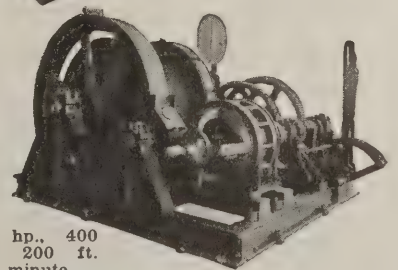
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and 300 ft.  
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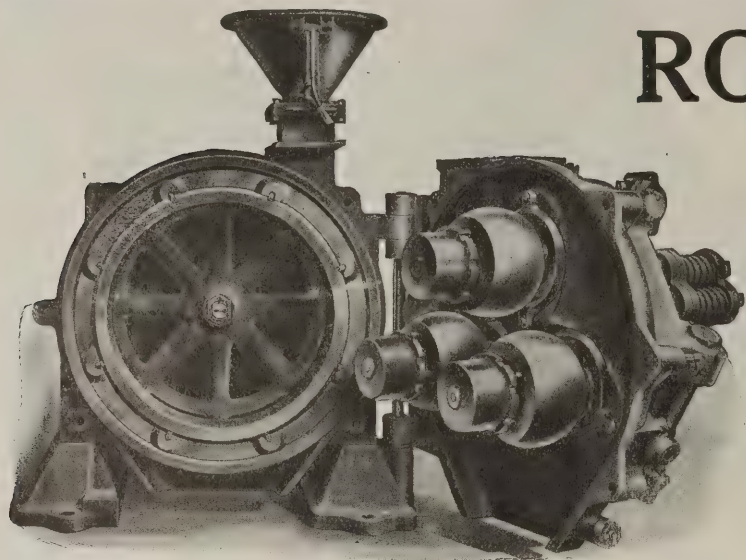


80 hp., 400  
and 200 ft.  
per minute

# VULCAN OF WILKES-BARRE HOISTS





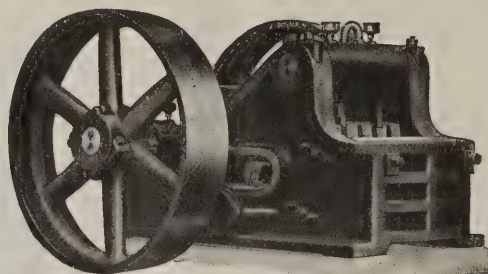


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## Orient, Lynch, Now Valier!

*8664 tons in a day, a new record*

A NEW WORLD'S RECORD was set Nov. 25, when the Valier Coal Co., in Southern Illinois, hoisted 8664 tons in 7 hr. 51 min. from a single shaft.

This beats the Orient mine record, (Chicago Wilmington and Franklin Coal Co.) of 8218 tons, made in March, 1922, and the Lynch, Kentucky, record (U.S. Coal and Coke Co.) of 12,880 tons, made Feb. 12, 1923 (but from two openings).

Coal hoisted in making all three records was undercut with

### SULLIVAN IRONCLADS

At Valier, 36 out of 39 continuous cutters in use are Sullivan A.C. Ironclads, equipped with 7½-ft. cutter bars, Tipturn trucks and self-winding reels. Most of these machines are 5 to 7 years old.

### SULLIVAN Roller Bit Sharpeners

—each served by a Miller automatic oil forge, sharpen all the mining machine bits used at Valier. During November, only 1.2 bits were sharpened for each ton of coal cut. Two men operate both sharpeners and forges.

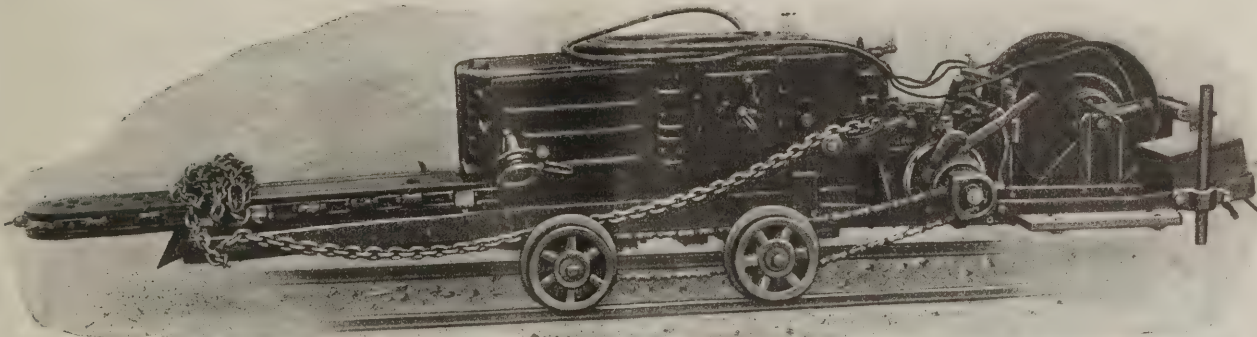
In making this record, 662 hand loaders filled 1920 cars, holding 4.51 tons each. The 600 cars made 3.5 trips each, on the average, traveling more than a mile each trip. The coal was dumped into a rotary dump at the bottom and lifted 660 ft. to the surface in 15-ton skips. 156 railroad cars were needed to haul away the day's output.

This record is no fluke, since on Nov. 26, 7763 tons were hoisted, and the average for December to the 12th was 7460 tons. (See Coal Age, Dec. 11, 1924).

Whether your mine is a record breaker, or of more moderate capacity, you can count on Ironclads to do their full share in your organization to keep production up, and costs down.

*Ironclads, Bulletin 79-DC*

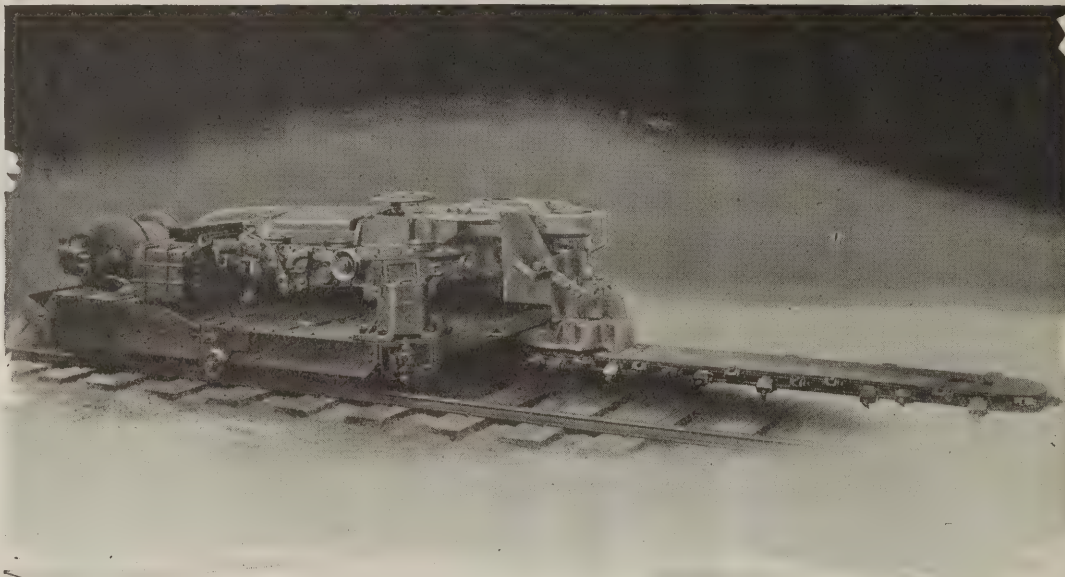
*Cutter Bit Sharpeners, Bulletin 72-LC*



**SULLIVAN MACHINERY COMPANY**  
134 SOUTH MICHIGAN AVE., CHICAGO, ILLINOIS U.S.A.







## Always Full Quota Production With Ball Bearing Motors on Coal Cutters

**R**IGHT through every shift this coal cutter does its full quota of work.

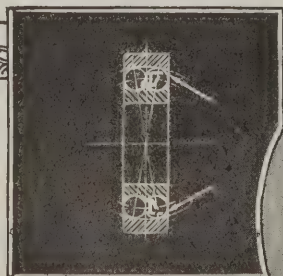
Reliability and endurance—these factors are essential if equipment is to stand up and give low-cost operation in the hard service of mining.

Skayef Self-Aligning Ball Bearings on the motors increase efficiency and guard against electrical troubles. Dust and grit are effectively excluded by sealed housings, which also prevent lubricant leakage on motor parts.

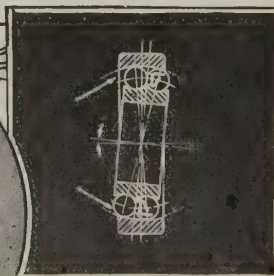
### THE SKAYEF BALL BEARING COMPANY

Supervised by **SKF** INDUSTRIES, INC., 165 Broadway, New York City

1300



Normal View



Deflected View





# Applying "GUNITE"

with the "CEMENT-GUN"  
in the mine of the

## Lehigh & Wilkes-Barre Coal Company

When the "Cement-Gun" isn't busy applying rock-dust, or "mudizing" your haulageways, it can be used as in these pictures from this big anthracite mine, to "gunite" (with sand-and-cement) the ceilings (also the walls) of underground pump-rooms and other chambers; also to fireproof and protect roofs, walls, shafts, entries, timbering everywhere in the mine.

Let us tell you all about the many uses for the "Cement-Gun" in your coal mine property.

THE CEMENT-GUN  
TRADE MARK

IS NOT A RESTRICTED  
ARTICLE AND MAY BE  
PURCHASED AND USED  
BY ANY ONE.

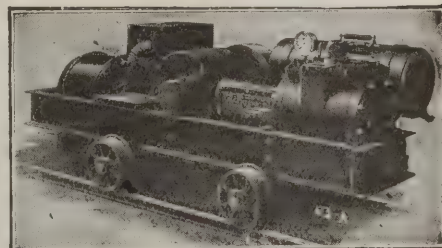
In order, however, to insure to all users of "Gunite" that they will obtain prompt and proper bids we have established a Contract Dept., and upon application we will be pleased to have them prepare estimates on your work.

**Cement-Gun Company**  
Incorporated  
Allentown, Pa.

New York Pittsburgh Phoenix Chicago  
Seattle Salt Lake City

Agents in Eastern Canada:  
General Supply Co. of Canada, 356 Sparks St., Ottawa

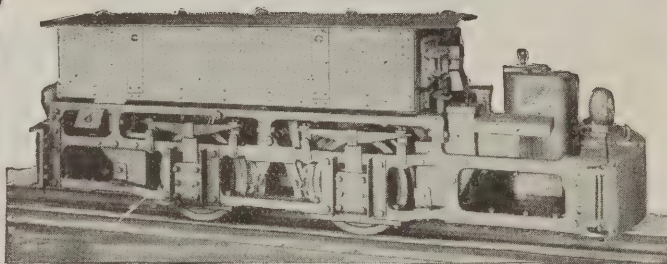
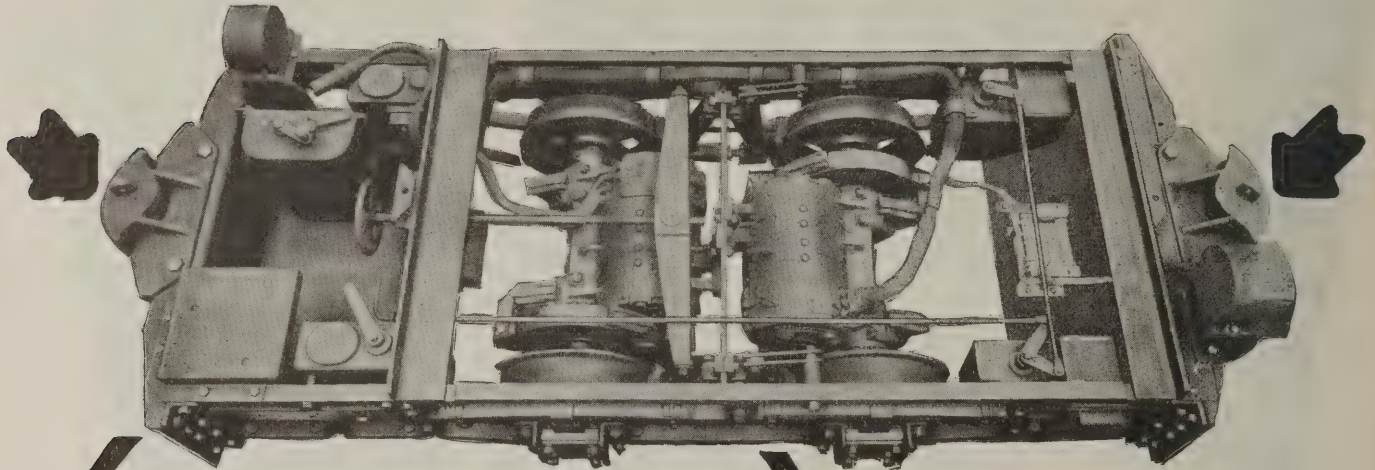
Foreign Agency:  
International Cement-Gun Co., Zeist, Holland



No "Cement-Gun" is Properly Complete  
Without a TRAYLOR Compressor



# From End to End



## A Real Mine Locomotive

**EVERY** part of the Baldwin-Westinghouse storage battery locomotive, from the sturdy barsteel frame to the smallest motor detail, is built to serve the user unfailingly and to give the greatest mileage from one battery charge.

### Barsteel frame:

This strong frame construction is an aid to ventilation and gives ready access to all parts of the chassis for inspection, lubrication or repair.

### Motors:

The slow speed motors are specifically constructed for mining service.

### Control:

Field control of the motors saves power by cutting out resistance except on first and second speed points.

An ample clearance is provided between the motors and the roadbed.

The battery crate is mounted on rollers to facilitate its removal.

Heat treated gears of high grade material add to the efficiency of the locomotive.

For complete information, address the nearest district office of either company.

Westinghouse Electric & Manufacturing Company  
East Pittsburgh Pennsylvania

The Baldwin Locomotive Works  
Philadelphia Pennsylvania

# Westinghouse



# Reduce Shut-Downs

*with Westinghouse Automatic Switching Equipment*

**A**FTER you have paid a lot of good money for motors and locomotives why keep them standing useless because of mistakes of carelessness resulting in needless shut-downs when using a manually operated board.

Automatic switching equipment can't make a mistake. It can't throw a running breaker in ahead of a starting breaker. It can't hold a starting breaker in until the coils of the auto transformer have been burned out. When the windings reach a dangerous temperature, it automatically shuts down the station until the danger is over. With automatic switching equipment a breaker can't be closed until the short circuit has been removed. Excessive heatings and overloads are taken care of automatically. Positive protection is always assured.

Replace the possibilities of human mistakes with mechanical certainty by specifying Westinghouse Automatic Switching Equipment for Substations.

Westinghouse Electric & Manufacturing Company  
East Pittsburgh Pennsylvania  
Sales Offices in All Principal Cities of  
the United States and Foreign Countries

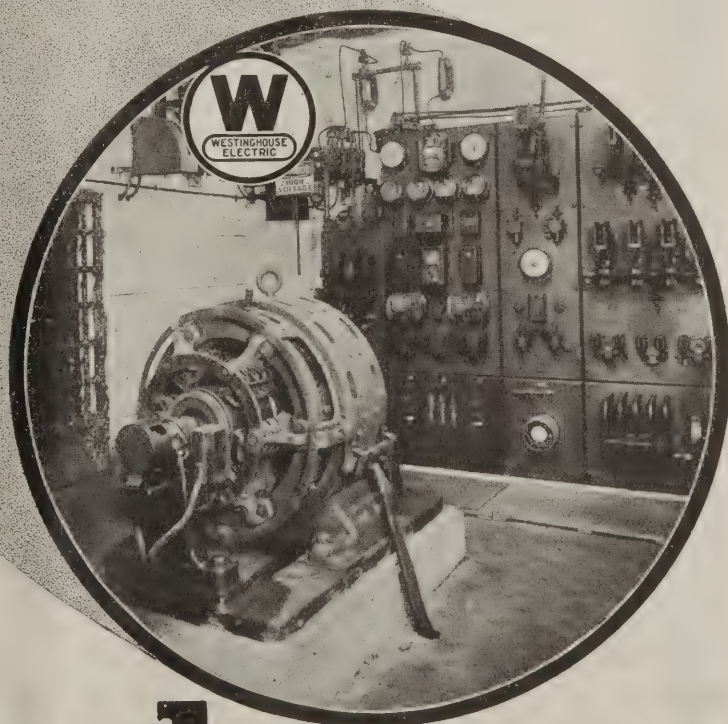
Here is the motor  
you bought

Here is the one that's  
working for you

Here is the locomotive  
you bought

Here is the one that's  
taking out your coal

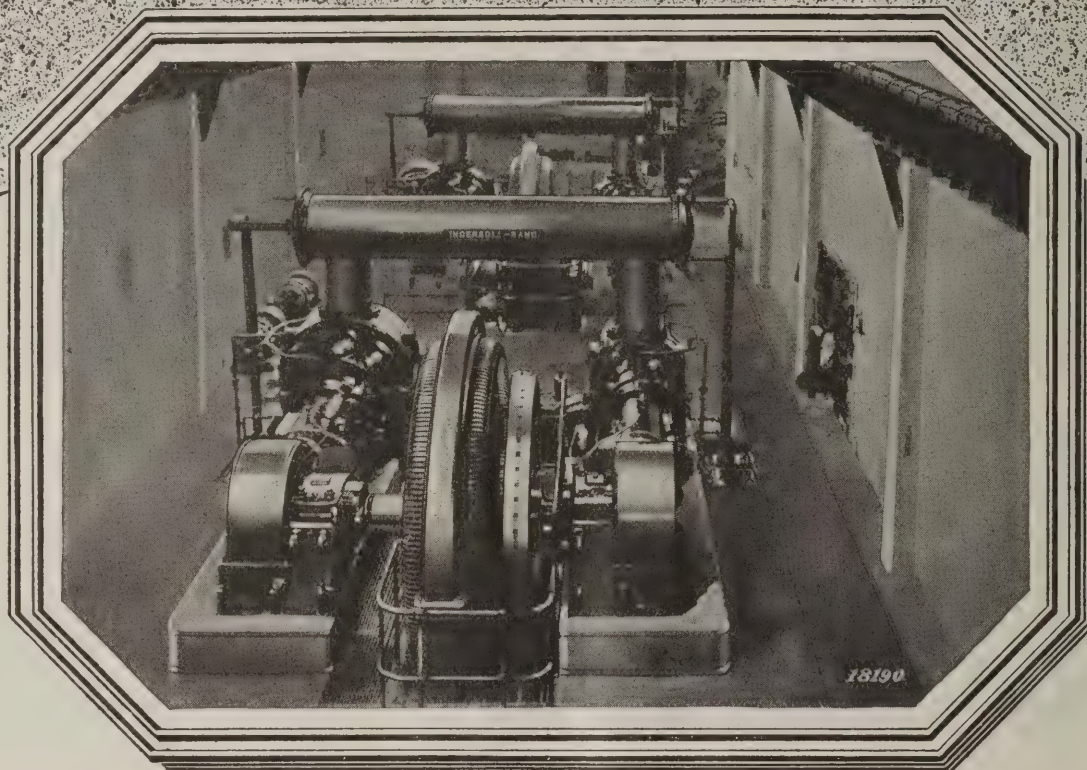
The solution—install  
Westinghouse auto-  
matic substations



# Westinghouse



# For the Mine



*Two large Class "PRE" Compressors installed in a large South American Copper Mine*

## An I-R Air Compressor

When you install a compressed air plant you count on making a permanent investment. You buy high efficiency and mechanical superiority on the basis that in the long run it will save money.

The Ingersoll-Rand Company builds only machines of the high grade you insist on having.

Class "PRE" electrically driven compressors, such as are installed in the above plant, will maintain reliable air service. They are doing this with less horsepower input per cubic foot of air delivered than is otherwise obtainable.

I-R Compressors are built in over 1000 sizes, types and capacities.

**Ingersoll-Rand Company, 11 Broadway, New York**

*Offices in principal cities the world over*

For Canada refer Canadian Ingersoll-Rand Co., Limited,  
260 St. James Street, Montreal, Quebec



# Ingersoll-Rand



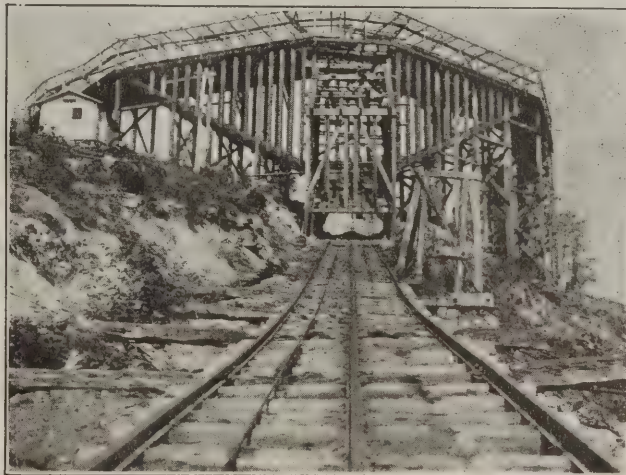
## Throwing Out Rotaries — Installing S. & D. Automatics

**Why? Because the Tremendous Saving Has Been Proved!**

This company operates two mines, and one of them has been equipped with "Automatics" for four years. They are now changing the other mine from rotary cars to "Automatic" Drop-bottom cars. Why? Because they KNOW it will pay. Their records PROVE that the cost will be saved in a few months—and then big dividends flow in.



AN AEROPLANE VIEW SHOWING THE NEW TIPPLE AND THE OLD TRACKS



A CLOSE-UP VIEW OF THE 600-TON STORAGE BIN TO BE FILLED AUTOMATICALLY BY THE AUTOMATIC CARS

Formerly they dumped four rotary cars at a time by machinery. Now they will have continuous operation without machinery. The "Automatics" are ten inches lower, and have a larger capacity. Proved and tested beyond question.

**The Real Money-Maker Will Do Likewise, and My,  
What a Golden Opportunity for the New Mine!**



UNLOADING 30 CARS A MINUTE WITHOUT LABOR OR MACHINERY

**Griffith Automatic Cars**

*Now Equipped With*

**S & D Automatic Couplings**

*"The Car for Hard Times"*

**Sanford Day Iron Works**

**Knoxville, Tenn.**

*"Whitney Wonder" wheels and bearings guaranteed 5 and 10 years respectively.*





# **1000 tons a Day from a few Acres of Territory**

It requires probably 200 acres of mine territory, average, to produce 1000 tons of coal per day; if this same tonnage can be produced from a very few acres of working territory—a very material saving in cost can be made.

Many operators are alive to this fact and are using concentrated mining methods by employing MOVOR Conveyors—the only underground conveyor with small interspersed drive units.

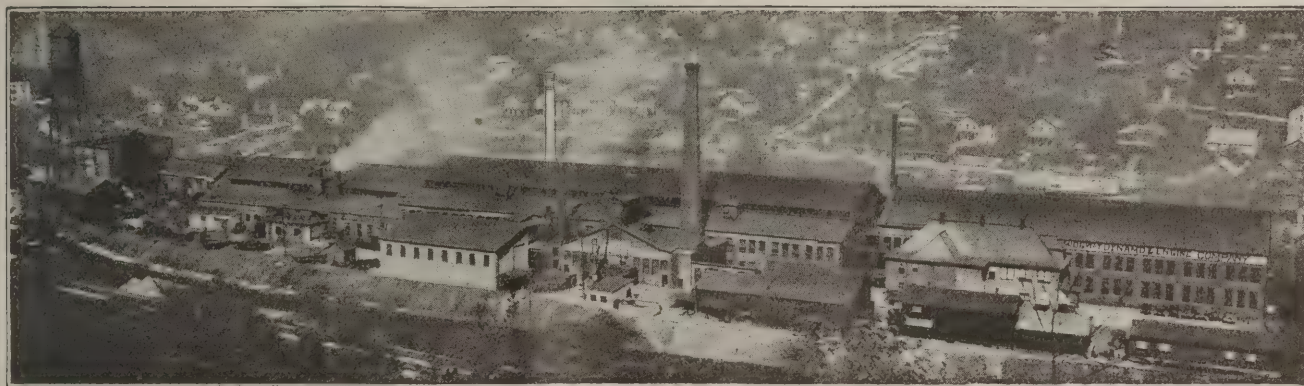
Write us for facts about the MOVOR Conveyor.

**The American Mine Equipment Co.**  
Farmers Bank Building, Pittsburgh, Pa.

# **MOVOR**



*Here's the Factory  
Not too big to give Service*



**Located in the Alleghenies, where bear and deer may still be found**

*We wish you  
A Merry Christmas  
and a  
Prosperous and Happy  
New Year*

the source of Ridgway Power Units may be of interest to the Coal Operators whom we have served for so many years.

We are proud of our factory and our organization. Not because the factory covers acres, nor because the number of our employees is legion, but because we are not so large as to be unable to give personal attention to the wants of our customers.

We attempt to give service. Sometimes we fail, but usually repair parts, when needed, are forwarded within a few hours after word of their need is received, and service men are dispatched promptly.

Our interest in keeping your plant operating is as great as your own and we try to do our share in promoting the welfare of this fundamental industry.

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ENGINE CO.  
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DETROIT GRAND RAPIDS KANSAS CITY LITTLE ROCK MEXICO CITY MINNEAPOLIS NEW ORLEANS  
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# 160<sup>to</sup>480% Dividends from investments in automatic pump control

160

480

This is for the man who likes the compound curves in a dollar mark and who revels in dividend figures. For this financially minded man we have a story as amazing as it is true. The story of an investment that will, in most cases, yield from 160% to 480%. And it isn't a stock selling yarn either.

Here is the essence of the thing.

In certain cases centrifugal mine pumps can be made to operate automatically thus doing away with the usual pump runner and saving his wages. The savings vary according to wage rates, the number of shifts of men used, etc., but in general, operating charges are reduced sufficiently to pay the installation cost in six months or less.

The method used to make the pumps self-operating is a patented system that has been amply tried out and there is abundant evidence that the plan is practicable and dependable. The apparatus used is as simple and easily understood by the operating force as the usual electrical equipment and pipe fittings found around a mine. This equipment was made especially for mine service, by mine pump specialists and is giving entire satisfaction and producing profits for a number of mine operators.

*Full details of this remarkable means of saving money will be gladly furnished.*

**BARRETT, HAENTJENS & CO.**  
Hazleton, Pa.



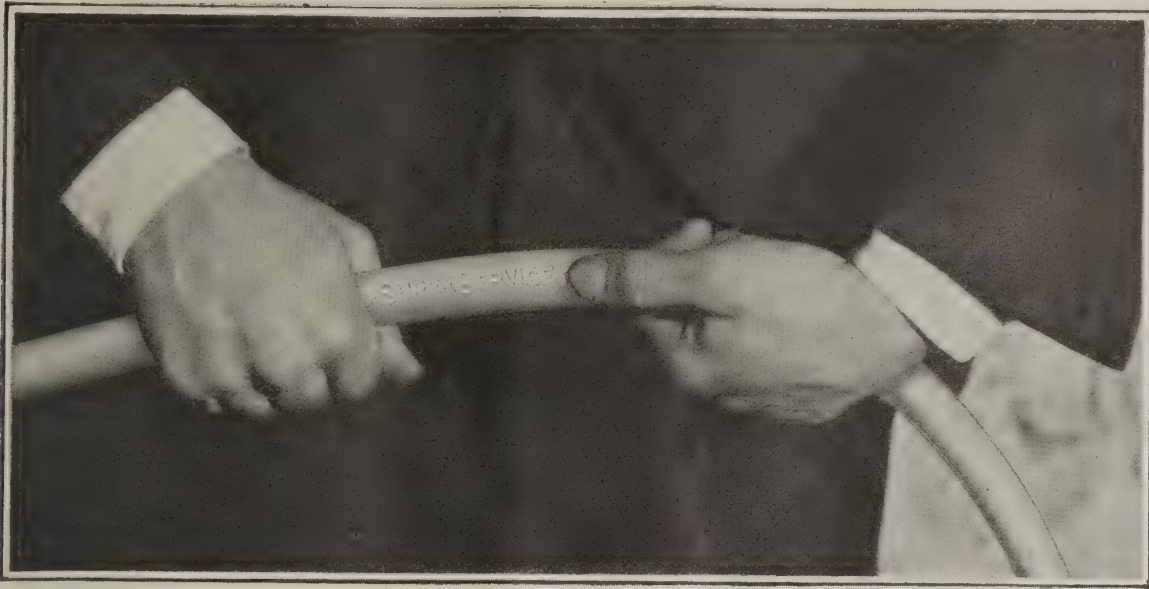
A typical automatic pumping station installed at one of the collieries of a large and well known anthracite coal company.



MANUFACTURED IN THE HEART OF

A GREAT MINING REGION





## A mark— and its meaning

**Y**OUR favorite automobile tire is marked, your hat has the maker's imprint, your clothes the tailor's label.

This means that the producer is proud of his product, he sponsors it—he is sure of the satisfaction it will give.

For the same reasons Super Service Cord and Cable have an identifying mark. The name is an integral part. Every twenty feet the words "SUPER SERVICE" are embossed on the surface—easily felt and distinguished.

All Rome Super Service Cords and Cables are so marked, so you'll be sure of the genuine, the only rubber sheathed conductors vulcanized in steel molds under tons of pressure—and built for "Super Service".

The "Super Service" family covers a complete range of types and sizes—some small enough for a dentist's drill, to large cables two and one half inches in diameter—with every mining requirement included.

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### **SUPER SERVICE**

Write for booklet, price lists and samples of Super Service Cable, made for all mining requirements.



# ROME WIRE

## WIRE-ROME





# There's no Joy without TIREX

All Joy Mechanical Loaders are equipped with Tirez Portable Cable. The makers of these efficient machines have standardized on this tough, flexible, long lasting Cable.

The non-inductive 60% rubber armor of Tirez Cable cannot become charged nor wear through as do cables with braided or woven coverings. This explains why Tirez has been selected for use with these up-to-date loaders.

There's no cable made which stands up so well against the continuous dragging and yanking about inevitable when operating portable underground equipment of this nature.

For loaders, undercutters, drills, gathering locomotives, you can't beat Tirez service.

All sizes are furnished in special lengths as ordered. Full particulars on our entire line of Tirez Cords and Cables will be sent you at once, upon request. Let us know where we can reach you.

**SIMPLEX WIRE & CABLE CO**

Boston New York Chicago San Francisco

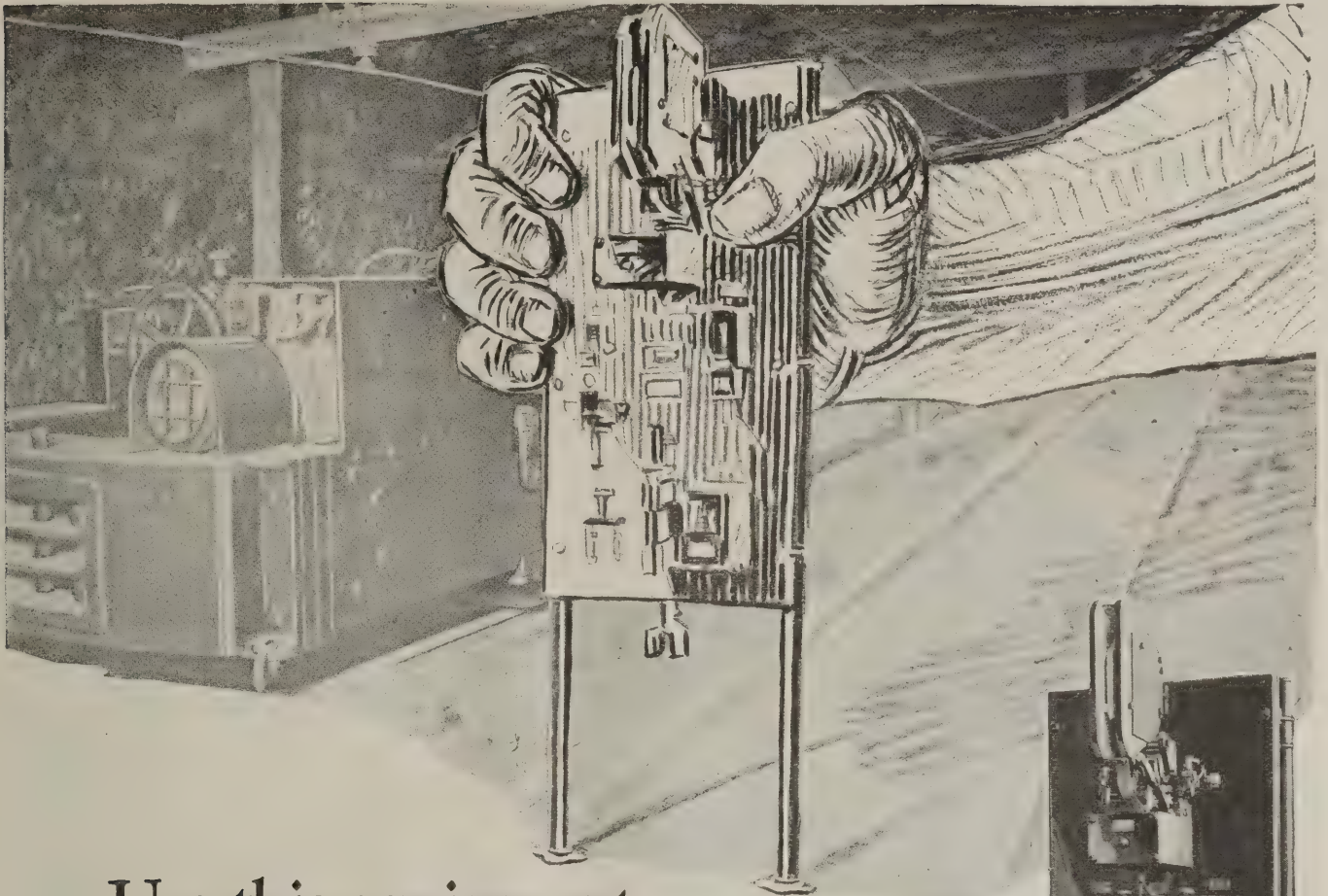
TRADE

# TIREX

MARK

**The Simplex Cable that wears like a Cord Tire**



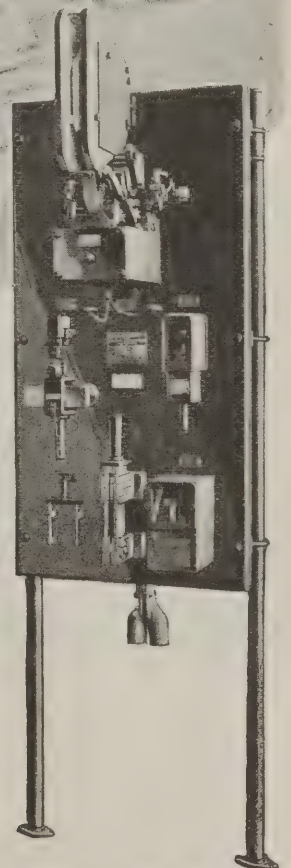


## Use this equipment to reclose feeder circuits and get maximum output

Add up the increases in your output if electric power were kept on your feeder circuits every possible moment and you have a measure of the principal advantage of G-E Automatic Reclosing Feeder Equipment. An exact calculation would be impossible, but a little study will show:

- Production can be increased by a continuity of electric power at the machine under normal conditions.
- Production can be increased by keeping electric power on main lines in case of a disturbance on a feeder.
- Production can be increased by eliminating delays incident to reconnecting an opened feeder circuit manually.

Which means that unless you already have Automatic Reclosing Feeder Equipment you have this opportunity to increase your output and your profits. Talk this over with representatives from our nearest office or send for information.



1640-amp., 275-volt, d-c.  
automatic reclosing equip-  
ment for stub-end feeder



# GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN ALL LARGE CITIES

54A-133



# "U.S." TAPE



## *The Right Tape for Every Job Around the Mine!*

Every mine electrician knows the importance of buying good tape—tape that is uniform in quality, high in tensile strength, and free from imperfections and pinholes. That's why experienced electricians always specify "U.S." Tape.

There's a complete line of "U.S." Tapes—a type for each particular use:

"U.S." Splicing Compound—A "Relio" splice is there to stay—a solid, waterproof joint, without heating. Scientifically compounded, easy to handle.

"U.S." Holdtite Friction Tape—Heavily coated on both sides with a high grade black rubber compound. For general electrical work.

"U.S." Armature Friction Tape—High quality white rubber friction, one side only of very thin closely woven sheeting.

*There are also five other special "U.S." Tapes*

**United States Rubber Company**

1790 Broadway

New York City

Branches in every industrial center.







"Knees Shimmieing  
Like a barn door  
in a cyclone"

## *The Sextette from Lucia, Ky.*

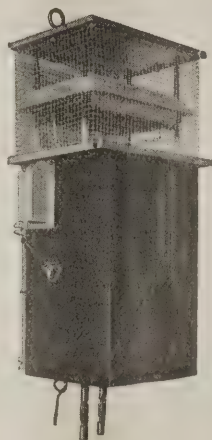
I've been caught in some tight jams already fooling around electrical equipment, but the biggest thrill that ever rattled itself up and down my spinal column was provided in the No. 2 Mine of the Acme Coal Company at Lucia, Ky. Keep your seat and I'll tell you about it. I drops off at this place by invitation one Fall morning and locates the G. M. up on the tippie with the Superintendent, where the two of them are directing the installation of a new loading boom.

"This survival of the fittest propaganda got you steamed up too?" I inquires after we had traded greetings.

"Isn't it the truth?" he smiles. "No kidding, we got to do things around here if we are going to remain out of the class of operators who are sitting around waiting for miracles to happen and provide juicy markets like we had after the big war."

"Wait until I dig up the 'Super,' Foreman and Electrician," he commands, "and I want to get your opinion on what we are going to need in the way of sectionalizing equipment."

A few minutes later the party is assembled and we make tracks for the inside. Well, it develops during the jaunt that they have been



### *The Circuit Breaker with Brains*

experiencing plenty trouble with low voltage coming from one overloaded section compounding itself with other sections carrying legitimate loads. Putting a stop to that is duck soup for us.

Finally we pull up in front of a room off one of the South entries, some mile and a half from the out-

side. Up at the face a machine runner and his helper are fighting a cutter bar putting up a game but losing battle. While we are crouching there the six of us are suddenly bathed in a shimmering green light. There fifty feet from us the cable covering had burned off from the crowding that machine armature had been giving it, and a six- or eight-inch arc was blazing in an atmosphere of suspended bug dust. Right away I get visions of the Wife and Kiddies cashing in my insurance policies, as I momentarily expect to have several tunnels drilled through my liver.

I turned to the "Super" and see him trying to hide a pair of knees shimmieing like a barn door in a cyclone. I get plenty kick out of the entire proceedings before the arc is extinguished, and the General Manager suggests maybe we have seen all we want to inside.

When we reach the surface again, the Boss tells me they have been figuring on our stuff for several weeks, but he knows he is going to get it now from the safety standpoint alone. "A breaker set down in that section to open on a low current value would never have permitted that arc to get started," he says.

And he was right!

## THE AUTOMATIC RECLOSING CIRCUIT BREAKER CO.

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have found this publicity worth while. You, too, should find it so.

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Testing Bituminous Coal Lands a Specialty

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Established 1895

PUNXSUTAWNEY, PA.  
Incorporated 1905



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**Mining Transits and Levels**

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WRITE FOR BULLETINS

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SULLIVAN MACHINERY CO.  
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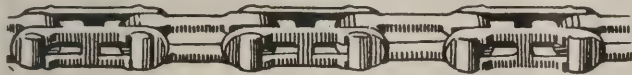


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Underground Coal Loaders

JOY MACHINE CO.

Pittsburgh      Huntington      Evansville      Denver



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Coal Preparation Specialties

"KEYSTONE" Rivetless Conveyor Chain saves time, temper and money. Try it where requirements are super exacting. The element of chance is absent with the purchase of any WILMOT equipment. Compound Gearing Rolls—Hollow Ground Roll Teeth—Simplex and other Coal Jigs—Flexible Arm Shaking Screens—Castings and Machine Work. Write

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Coal Washing

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Coke Stokers — Type E Stokers — New Frederick Stokers  
A WORLD ORGANIZATION

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QUINN OIL BURNER      GREEN STOKER      LOPULCO SYSTEMS



Montgomery Coal Washing  
& Mfg. Co.  
BIRMINGHAM,  
ALA.



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Particularly for those conditions  
which are unusual or exacting

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Main Office and Works: Cleveland, Ohio

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RHEOLAVEUR

"The Washer that Removes the Refuse  
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Transmit from 1/4 to  
5000 hp. at 98.6%  
constant efficiency.

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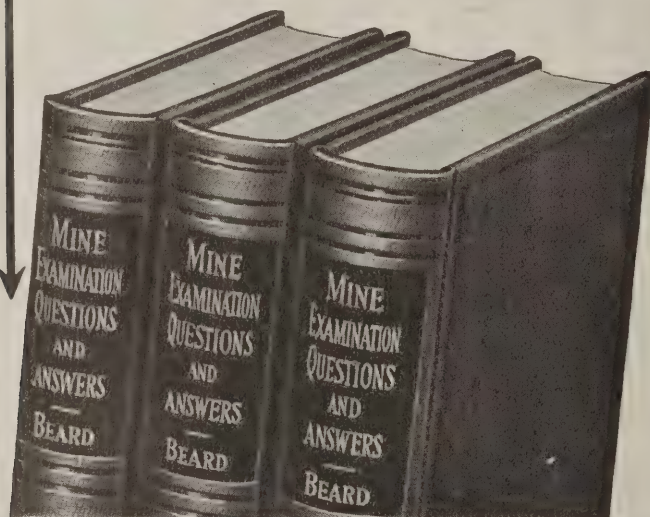
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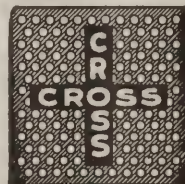
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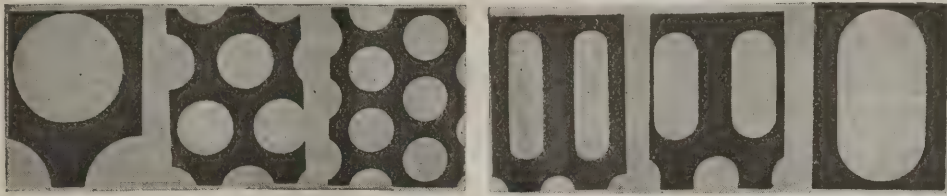
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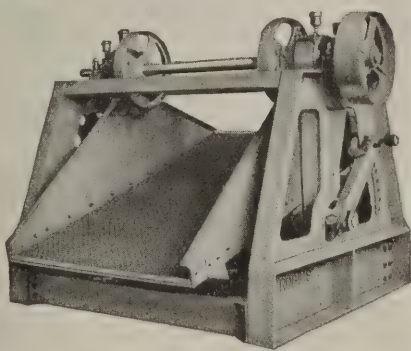
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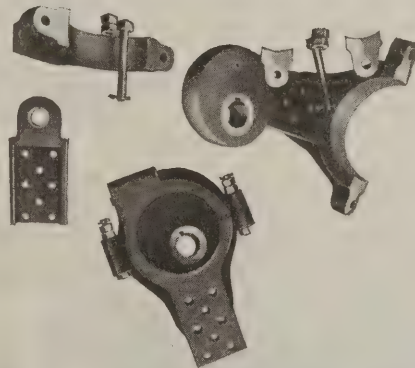
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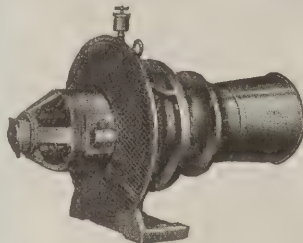
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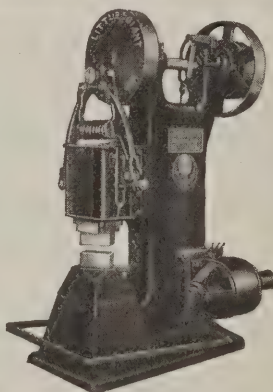
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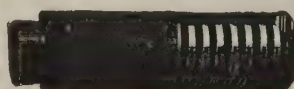
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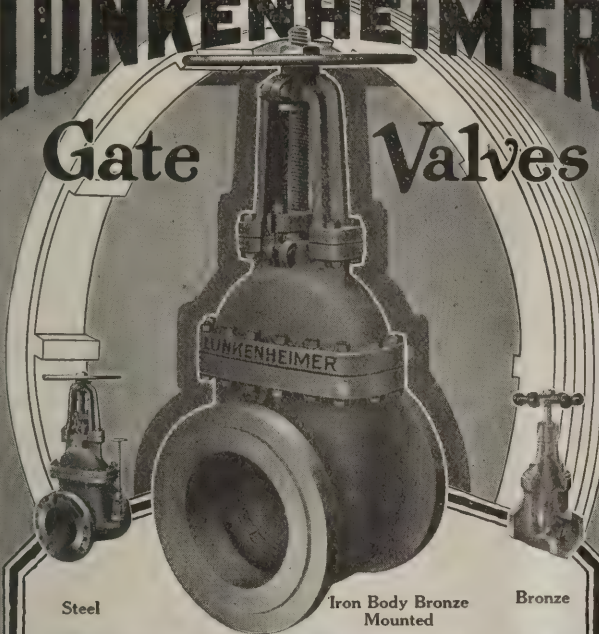
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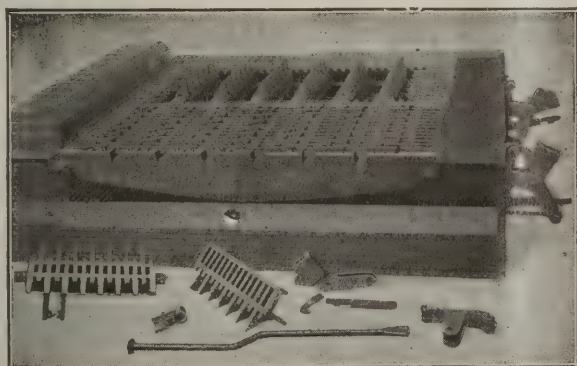
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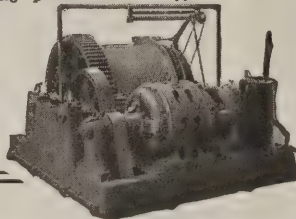
# SURE-GRIPS

## OTTUMWA Electric and Steam HOISTS

Ottumwa Hoists comprise a line which completely covers the requirements of coal mines. Ottumwa Engineers are always available for consultation regarding hoisting problems.

**Ottumwa Iron Works**  
Ottumwa, Iowa

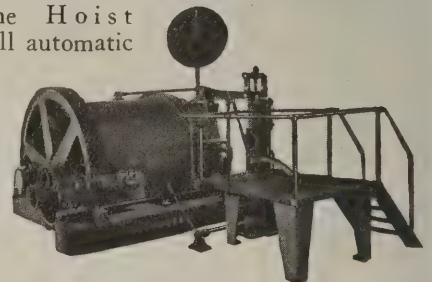
Ottumwa Electric and Steam  
Hoists, Mine Cars, Sheave  
Wheels and Rollers and  
Roller Bearing Trucks.



## PLANE HOISTS OF MERIT

Treadwell Plane Hoist equipped with full automatic safety control power and hand brakes. Built in sizes from 100 hp. up.

Treadwell Hoists are made to meet all operating conditions.



**TREADWELL ENGINEERING CO.**  
EASTON, PA.

Call 'em  
**CASS**  
not Aetna

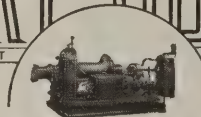
## SMOOTHING STONES

The name of these well-known commutator smoothing stones has been changed.

**ELECTRIC SERVICE SUPPLIES CO.**  
17th and Cambria Sts., Philadelphia, Pa.; Monadnock Bldg., Chicago. Branches: New York, Boston, Pittsburgh, Scranton.

## FLORY HOISTS

FOR EVERY REQUIREMENT  
**S. FLORY**  
BANGOR  
95 Liberty St.



STEAM-ELECTRIC-GASOLINE  
**MFG. CO.**  
PENNA.  
New York

**NORDBERG**



**MACHINERY**

## NORDBERG

Uniflow Engines · Corliss Engines · Diesel Engines  
Steam and Electric Hoists  
Condensers · Compressors · Special Machinery

**NORDBERG MANUFACTURING CO.**  
MILWAUKEE WISCONSIN

## HERRINGBONE CUT GEARS

MILL  
DRIVES  
SPEED REDUCERS



SPUR  
WORM  
BEVEL GEARS

**FAWCUS MACHINE CO. PITTSBURGH, PA.**

## Chattanooga ARMATURE WORKS.

REWINDING ELECTRICAL  
PAIRING BUILDING MACHINERY

CHATTANOOGA, TENN.

Send for free speed reducer book.  
**FOOTE BROS. Speed Reducers**

Send for free gear book.



mean  
TRANSMITTING POWER  
SAFETY, ECONOMY & EFFICIENCY IN

**FOOTE BROS. GEAR & MACHINE CO.**  
226-236 N. CURTIS ST., CHICAGO, ILL.

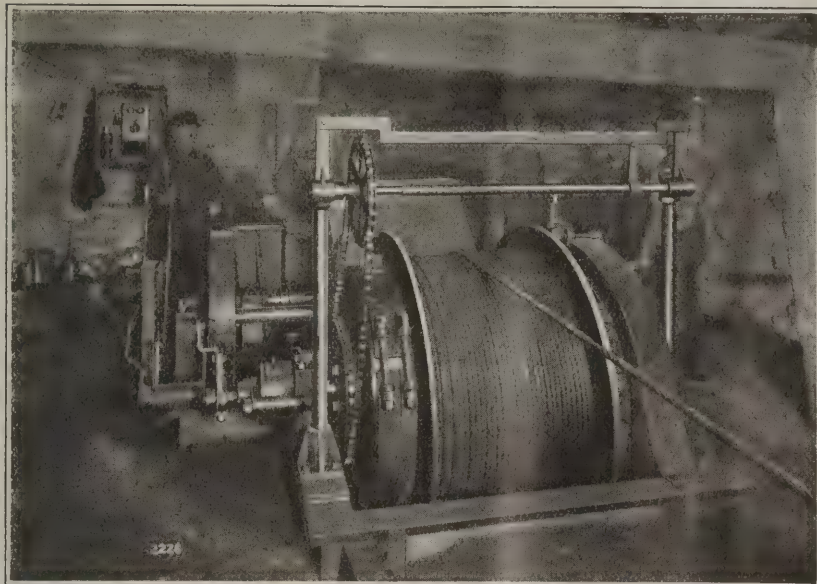


## MEDART means EVERYTHING in Line Shafting Equipment

**THE MEDART COMPANY**  
(Formerly Medart Patent Pulley Co.)  
General Offices and Works: St. Louis, U. S. A.  
Office and Warehouse: Cincinnati Offices: Chicago and Philadelphia



# LIDGERWOOD MINE HOISTS



## ELECTRIC—STEAM

*We build mine hoists of all types and sizes, to meet the many varied conditions of mine service. Each type is designed and built to meet the requirements of each installation.*

The illustration shows an electric hoist in use by the Spencer Coal Co. It is working on an underground slope, giving the best of satisfaction. The drum coils 1,800 ft. of rope; hoist has a rope pull of 7,000 lbs. at 500 f.p.m.

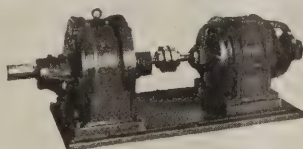
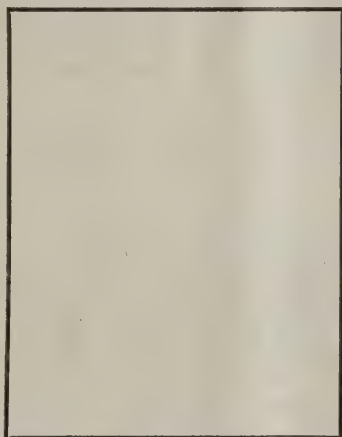
*Catalogs Upon Request*

**Lidgerwood Mfg. Co., 96 Liberty Street, New York**

Philadelphia Pittsburgh Chicago Detroit Seattle Birmingham, Ala. Los Angeles Portland, Ore. Columbus, O. Tacoma  
London, England Sao Paulo, Brazil Rio de Janeiro, Brazil  
Woodward, Wight & Co., New Orleans, La. John D. Westbrook, Inc., Norfolk, Va. Norman B. Livermore & Co., San Francisco

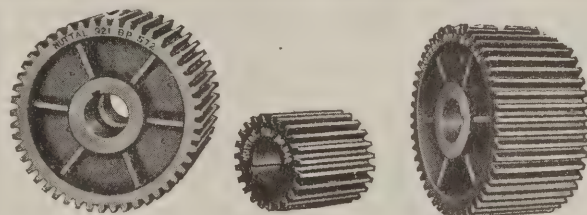
**This →  
space  
reserved  
for you**

It indicates the relative proportions of the D. O. James speed reducing book—which is yours on request. We could show the cover of this book but that wouldn't help you solve your problems of direct-connected drives.



THE D. O. JAMES MFG. CO.  
1120 W. Monroe St., Chicago, Ill.

**D.O. JAMES  
SPEED REDUCERS**



**4 to 1—it's a Nuttall Gear  
if it lasts 4 times as long.**

Nuttall BP Gears last four times as long as untreated gears—and then some.

It saves 70% to use them on your mining machines, locomotives, hoists, pumps, etc.

*Ask for Bulletin.*

**R.D. NUTTALL COMPANY  
PITTSBURGH PENNSYLVANIA**

Philadelphia Office: Westinghouse Bldg., 30th and Walnut  
Chicago Office: 2133 Conway Bldg.  
Canadian Agent:  
Lyman Tube & Supply Co., Ltd., Montreal and Toronto

**Nuttall**





## THE SHAY

### Is the Standard of Comparison

WHEN geared industrial locomotives are discussed, the standard of comparison, by which others are judged, is the Shay.

"We believe and know," writes the owner of one company, "that the Shay is the best and surest power on the market. It is very economical in operation and handles a larger tonnage than any other kind of power on the market today."

Nearly half a century ago, the original

Shay Geared Locomotive was designed to operate under great difficulties.

Built particularly for hard service, the Shay Geared Locomotive has proven ideal for operation in almost inaccessible places, on sharp curves and steep grades, with temporary unballasted track.

Before you choose new engines for your work, compare them with the strip mine standard—Shay Geared Locomotives.

**LIMA LOCOMOTIVE WORKS, Incorporated**

17 East 42nd Street, New York

Lima, Ohio



FIG. 50  
Vertical Triplex Pump

### Forty-Three Years

of pump building stand back of every Deming Pump to guarantee long dependable service at the lowest cost for operation and upkeep.

Complete Mine Pump Bulletin on Request  
**THE DEMING CO.** Est. 1880 Salem, Ohio  
"Distributors in All Principal Cities"

**Deming**  
HAND AND POWER **PUMPS** FOR ALL USES

## HYDRELEC

**Columbus Gear & Pump Co.**  
330 E. Second Ave.  
Columbus, Ohio

*Pumps*



Steam Turbines, for all speed and steam conditions. Catalog D71.  
Double Helical Speed Reducing Gears. Catalog G71  
Centrifugal Pumps, for all capacities. Catalog B71  
Centrifugal Blowers and Compressors. Catalog F71

**De Laval**  
Steam Turbine Company, Trenton, N.J.

### ATLAS

Mine Locomotives

**THE ATLAS CAR & MFG. COMPANY**  
CLEVELAND, O.

Engineers

Manufacturers



WHEN buying a locomotive consider **Quality, Long Life**—then investigate the advantages a **PORTER** offers.

*Bulletins on Request*

**H. K. PORTER COMPANY**

Established 1865

**PITTSBURGH, PA.**

## ALLIS-CHALMERS

MILWAUKEE, WIS. U.S.A.

Power and Electrical Machinery, Mining Machinery, Pumping Engines, Centrifugal Pumps, Crushing Machinery, Steam and Electric Hoists, Power Transmission Machinery, Timber Treating and Preserving Machinery, Air Compressors.

## THE IRONTON

STORAGE BATTERY LOCOMOTIVE

**The Ironton Engine Co.**  
Ironton, Ohio

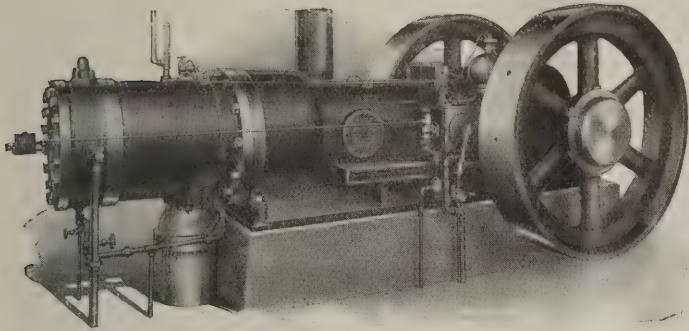
**EFFICIENT**, economical hauling. Find out about storage battery locomotives for your hauling. The Ironton is the best storage battery locomotive.





# PRIMM

## OIL ENGINES



### Fuel Economy— Greater Than Ever

**T**he PRIMM Oil Engine has always been noted for great fuel economy, advanced design and trim appearance. When we produced the type "BU" PRIMM Engine a few years ago it was met with acclaim by engineers as the finest type of low compression oil engine yet produced.

OUR engineers did not then consider their task ended—they still experimented—they still sought to effect improvements. It seemed they could do no more for the type "BU" PRIMM Engine was indeed a wonder.

Recently their efforts were rewarded. They made several new discoveries which have been incorporated in the new type "SBU" PRIMM Engine—the greatest of them all.

Greater simplicity of design, vastly increased fuel economy and an exceedingly handsome appearing PRIMM Engine is the result of their efforts. To those who are interested in this most efficient of prime movers we shall be pleased to send a descriptive bulletin.

**20 to 300 H. P.**

**Semi-Diesel**

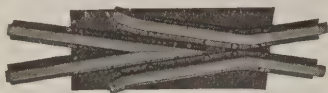
**The  
Power Mfg. Co.**

**720 Cheney Avenue  
Marion, Ohio**

*"Tool Steel" gears  
In severest test,  
For thirteen years  
Have proven best."*

The Tool Steel Gear & Pinion Co.  
Cincinnati, Ohio





## The Riveted Plate Frog

Here's a Frog made of steel plate with rails riveted together. Strong, durable, stands the gaff.

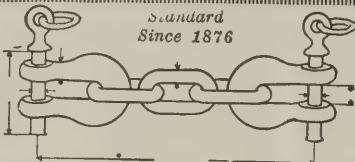
Let us tell you about our full line of trackwork, dumps conveyors, cars, etc.

**HELMICK**  
**FOUNDRY & MACHINE CO.**  
 FAIRMONT, WEST VA.

### "SUPERIOR"

#### Mine Car Hitchings

The extra strength of "Superior" Mine Car Hitchings assures safety and long service life. We have specialized on "Superiors" since 1876 and will offer you facts to prove in how many ways they are better.



Pittsburgh Knife and Forge Co. Coraopolis, Pa. Established 1876  
 Successors Pittsburgh Steel Mfg. Co. and Wm. Harrie & Son Co.

ROTARY CAR-DUMPERS FOR MINE CARS  
 (GRAVITY, ELECTRICAL OR PNEUMATIC DRIVE)

**WABCO CHICAGO ILL.**

THE MECHANICAL SPRINGER  
 AUTOMATIC TRIP CONTROL EQUIPMENT

"SOLIDCAR" SELF-DUMPING CAGES  
 CAR CONTROL AND CAGING EQUIPMENT

**CAR DUMPER & EQUIPMENT CO.**

WESTINGHOUSE BROS.  
 PITTSBURGH PA.

ROTARY CAR-DUMPERS FOR  
 STANDARD GAUGE RAILROAD CARS



## PLYMOUTH

### Gasoline Locomotives

For mine use and general industrial haulage. Made in 3 to 15 ton sizes and in any track gauge. Write for Catalogs and Performance Bulletins.

THE FATE-ROOT-HEATH CO.  
 Plymouth, Ohio

**Waverly**  
 ALL PENNSYLVANIA

**OILS and GREASES**  
 for MINE CARS and MACHINERY

Refined from All Pennsylvania  
 Paraffin Base Crude Petroleum  
SEND FOR OIL AND GREASE CHARTS

**Waverly Oil Works Company**  
 5500-54th ST., PITTSBURGH, PA.

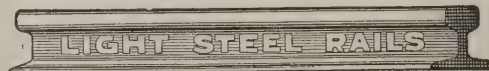
**GO TO YOUR LOCAL MINE SUPPLY DEALER**

GASOLINE STORAGE BATTERY  
**WHITCOMB**  
 FRODOLE COMBINATION

**Decrease Haulage Costs**  
 — WRITE FOR CATALOG —  
**Geo. D. Whitcomb Company**  
 ROCHELLE — ILLINOIS

SEE OUR ADVERTISEMENT IN THE FIRST ISSUE OF EACH MONTH

**SWEET'S**  
**Track Materials**  
*The World's Standard for over 20 Years*  
**Sweet's Steel Co. • Williamsport, Pa.**



8, 12, 16, 20, 25, 30, 35, 40 lb. per yard  
 Splices, Spikes, Frogs and Switches

**UNITED STATES RAIL CO.**  
 CUMBERLAND, MARYLAND

**NEW and RELAYING RAILS**  
 1 TON OR 1000

**LB FOSTER CO.**  
 PITTSBURGH - PENNSYLVANIA

TRACK EQUIPMENT RAIL ACCESSORIES

**NEW YORK JERSEY CITY PHILADELPHIA HAMILTON, O.**

The  
**West Virginia Rail Co.**  
 Manufacturers  
**Light Steel Rails**  
 8-12-16-20-25-30-35-40-45-50-lbs. per yd.  
 Frogs & Switches—Steel Mine Ties  
 Huntington, W. Va.

**CARS**  
**TRACK**  
**SWITCHES**

**KOPPEL** **KOPPEL**

**KOPPEL INDUSTRIAL CAR & EQUIP. CO.**  
 KOPPEL, PA.

## The Secret of Good Bonding

is good welding; the secret of good welding is a good welder.

### AJAX ELECTRIC ARC WELDER

has made good everywhere. Always ample amperage in spite of voltage drop. Only ample amperage insures adequate penetration; only adequate penetration insures a lasting weld. Rugged, light, inexpensive.

Write for bulletin.

Railway Track-work Co., Philadelphia

216

## THE SEARCHLIGHT SECTION

Man you want  
 will locate the Position you want  
 Equipment you want

*Are you using the Searchlight?*

## Mancha's Electric Mule

Mancha Storage Battery Locomotive Co.  
 St. Louis, Mo.

Representatives In All Principal Cities





## THE LORAIN STEEL COMPANY

Johnstown, Pa.



Manufacturers of Steel and Composite mine cars, and all kinds of mine track work.

### Sales Offices:

Atlanta Chicago Cleveland New York  
Philadelphia Pittsburgh  
Pacific Coast Representative:  
United States Steel Products Company  
Los Angeles Portland San Francisco Seattle  
Export Representative:  
United States Steel Products Company, New York, N. Y.

## HULBURT'S

Drive out the Friction Devils.

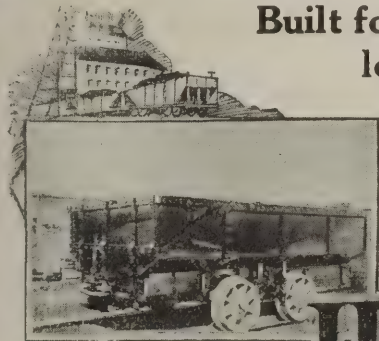
Mine Car Grease  
Mining Machine Lubricant  
Locomotive Lubricant  
Wool Yarn Elastic Grease  
Cup Greases  
Cable Grease  
Mechanical Loader Grease

HULBURT OIL & GREASE CO.,  
Specialists in Coal Mine  
Lubrication.

Gen'l Offices & Works: Phila., Pa.  
Distributing Points  
Throughout Coal  
Mining  
Fields.



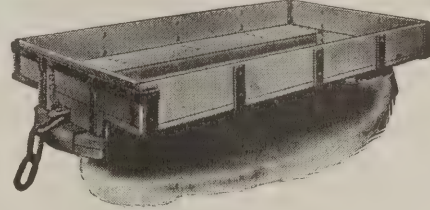
## Built for the long, hard run



The "Channel-Bar" truck—the cold rolled steel floating axles with dust proof bearings—the steel plate center bumpers—these features explain in part the Irwin capacity for long service.

# IRWIN

Irwin Foundry & Mine  
Car Co.  
Irwin, Pa.



## Complete Cars Trucks of all Types

Builders of the Hollow Axle Truck

SOUTHERN WHEEL COMPANY  
ST. LOUIS, MO. BIRMINGHAM, ALA.

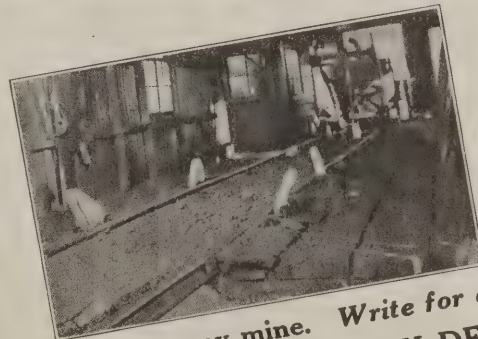
## Leschen Wire Rope Is Dependable

When you buy Leschen Wire Rope you are not experimenting, for its ability has been proven by its service record. For heavy mine hoisting and haulage and for steam shovels, mining machines, etc., we recommend Hercules (Red-Strand) Wire Rope because its unusual durability enables it to work with marked economy under such conditions.

Established 1857

A. Leschen & Sons  
Rope Co.  
St. Louis, Mo.

New York Chicago Denver  
San Francisco



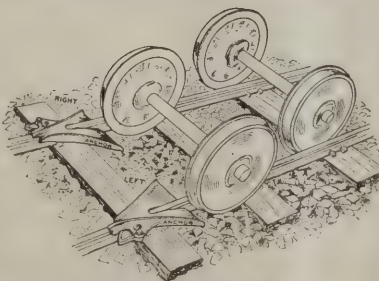
A  
NOLAN  
Saves  
Labor

at any mine. Write for data.  
THE MINING SAFETY DEVICE CO.  
Bowerston, Ohio

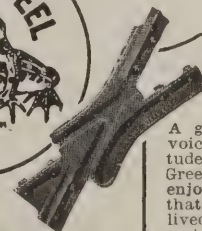
## 'ANCHOR' RERAILERS

You should carry a pair on every locomotive  
ARE YOU

still trying to retrack cars and locomotives with crude blocks, props, etc., and wasting half an hour or more? If so, try "Anchor" Rerailers, and see how easy it is done. The time saved at one wreck pays for their cost.



T. H. EDELBLUTE CO. Wabash Bldg.  
Pittsburgh, Pa.



## Reputation

A good reputation is the silent voice of approval by a multitude of satisfied customers. Green's "Durabil" Titanium Frogs enjoy a good reputation—proof that they have in every way lived up to the highest expectations of their users.

L. A. Green Railway  
Equipment Co.  
First National Bank Bldg.  
Pittsburgh, Pa.

Send for  
latest Bulletin



# Fast, safe mine "rail- roading"

## CENTRAL Mine Track Equipment

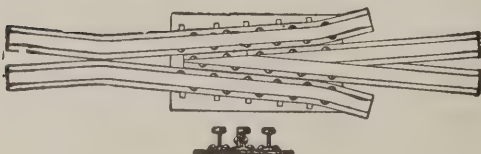
Today's mining problem is a problem of getting out coal at lower cost, and good track work is a first essential in this new drive for efficiency and economy.

CENTRAL frogs, switches, crossings, turnouts, switchstands, etc., are doing their part by making mine "railroading" safer—even at high speeds—eliminating delays, tie-ups and other troubles that cut down production figures. Smooth, continuous transportation requires expertly designed and well-built equipment at the vital haulage points and CENTRAL products are giving this type of service at many mines.

No track equipment gets harder service with less upkeep than mine trackage.

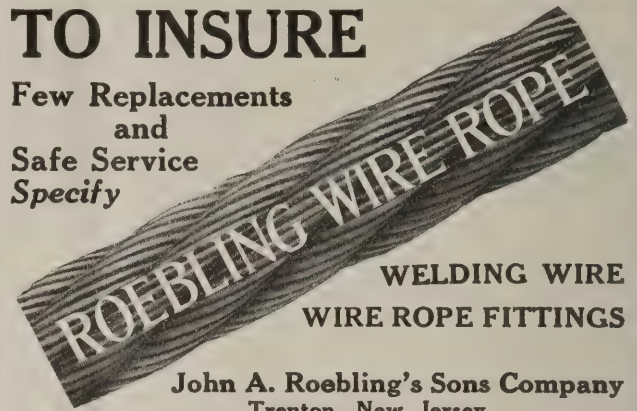
This is just one reason why better quality is built into CENTRAL frogs and switches, and why they stand all the pounding of heavy locomotives at high speed coupled to strings of loaded cars.

**The Central Frog & Switch Co.**  
Cincinnati, Ohio



## TO INSURE

Few Replacements  
and  
Safe Service  
Specify



WELDING WIRE  
WIRE ROPE FITTINGS

**John A. Roebling's Sons Company**  
Trenton, New Jersey

## Bethlehem Products for Mines



*Parallel Throw  
Switch Stand,  
Model 1217.*

Frogs, Switches, Switch Stands, Rails, Splice  
Bars, Bolts, Spikes, and Cambria Mine Ties.

### BETHLEHEM STEEL COMPANY

General Offices: Bethlehem, Pa.

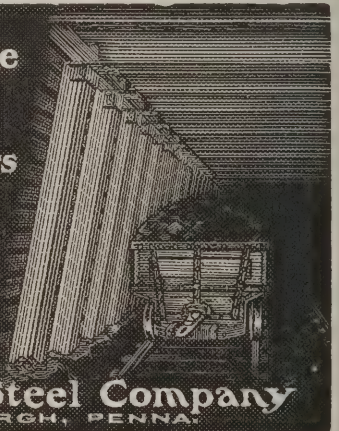
Sales Offices in the Following Cities:

New York Boston Philadelphia Baltimore Washington Atlanta Pittsburgh  
Buffalo Cleveland Cincinnati Detroit Chicago St. Louis San Francisco

## Equip Your Mine With Steel

Steel Mine Timbers  
Steel Cross Ties  
Wheels-Axles  
Rails-and  
Accessories

**Carnegie Steel Company**  
PITTSBURGH, PENNA.



## DUNDEE "A" AND "B" FRICTION TAPES



Great Adhesive  
Strength  
High Quality  
Long Life  
Priced Right



Write for Samples and Circulars

**THE OKONITE Co., Passaic, N. J.**  
Incorporated 1884

Sales Offices: New York—Atlanta—Pittsburgh—San Francisco.  
Agents: Central Electric Co., Chicago, Ill.; Pettingell-Andrews  
Co., Boston, Mass.; The F. D. Lawrence Electric Co., Cin-  
cinnati, Ohio; Novelty Electric Co., Philadelphia, Pa.  
Canadian Representatives: Engineering Materials Limited, Montreal.





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## A Classified Index of Advertisers in this Issue

For Alphabetical Index See Last Page

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Interstate Equipment Corp.  
Leschen & Sons Rope Co., A.
- Air Aftercoolers**  
Chicago Pneumatic Tool Co.  
Ingersoll-Rand Co.
- Air Receivers**  
Chicago Pneumatic Tool Co.  
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- Commutators**  
Chattanooga Armature Wks.
- Compressors, Air**  
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Cement-Gun Co., Inc.  
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General Electric Co.  
Ingersoll-Rand Co.  
Nordberg Mfg. Co.  
Sullivan Machinery Co.
- Condensers**  
Ingersoll-Rand Co.
- Consulting Engineers (See Alphabetical Index)**
- Controller Equipment**  
Automatic Reclosing Circuit Breaker Co.
- Controllers**  
General Electric Co.  
Goodman Mfg. Co.  
Westinghouse E. & M. Co.
- Conveyors, Chain Flight**  
Cross Engineering Co.  
Link-Belt Co.  
Webster Mfg. Co.
- Conveyors, Coal**  
American Mine Equip. Co.  
Fairmont Mining Mchry. Co.  
Jeffrey Mfg. Co.  
Link-Belt Co.  
Marion Mch. F. & S. Co.  
Robins Conveying Belt Co.  
U. S. Rubber Co.
- Couplings, Flexible**  
Foote Bros. Gear & Mch. Co.
- Cranes**  
Link-Belt Co.
- Cranes, Locomotive**  
Link-Belt Co.
- Crossings (See Switches, Frogs and Crossings)**
- Crushers, Coal**  
American Pulverizer Co.  
Bartlett & Snow Co., C. O.  
Jeffrey Mfg. Co.  
Link-Belt Co.  
Marion Mch. F. & S. Co.  
Pennsylvania Crusher Co.  
Raymond Bros. Impact Pulverizer Co.  
Sturtevant Mill Co.  
Vulcan Iron Works  
Webster Mfg. Co.
- Crushers, Rock**  
Raymond Bros. Impact Pulverizer Co.  
Sturtevant Mill Co.
- Cutter Lubricants**  
Hulburt Oil & Grease Co.
- Dealers' Machinery**  
(Rail, Pipe and Mch. Equip.)  
Archer Armstrong, Inc.  
Bridell Co., Inc. W. C.  
Chuse Engine & Mfg. Co.  
Cohen & Son, L.  
Duquesne Elec. Mfg. Co.  
Foster Co., L. B.  
Frank, M. K.  
Green Railway Equip. Co., L. A.  
Greenspons Sons Iron & Steel Co., Jos.  
Gregory Electric Co.  
Hyman-Michaels Co.  
Lindheimer, S. W.  
Miller-Owen Electric Co.  
Moorehead Elec. Mchry. Co.  
Nashville Industrial Corp.  
Pgh. Boiler & Machine Co.  
Power Machinery Ex., Inc.
- Diamond Core Drill, Contracting**  
Diamond Drilling & Exp. Co.  
Hoffman Bros.  
Punxsutawney D. & C. Co.  
Sullivan Machinery Co.
- Dies, Plain & Form Forging**  
Little Giant Co.
- Drafting Materials (See Eng. Instruments and Supplies)**
- Driers, Sand**  
Electric Service Supplies Co.
- Drills, Air**  
Chicago Pneumatic Tool Co.  
Ingersoll-Rand Co.  
Sullivan Machinery Co.
- Drills, Core**  
Chicago Pneumatic Tool Co.  
Diamond Drilling & Exp. Co.  
Ingersoll-Rand Co.  
Sullivan Machinery Co.  
Whitcomb Co., Geo. D.
- Drills, Electric**  
Chicago Pneumatic Tool Co.  
Jeffrey Mfg. Co.  
Sullivan Machinery Co.
- Drills, Electric Portable**  
General Electric Co.
- Drills, Power**  
Chicago Pneumatic Tool Co.
- Drills, Rock**  
Chicago Pneumatic Tool Co.  
Ingersoll-Rand Co.
- Drives, Silent Chain**  
Morse Chain Co.
- Dump Protectors**  
Mining Safety Device Co.
- Dumps, Crossover**  
Phillips M. & M. Supply Co.  
Sanford-Day Iron Works
- Dumps, Rotary**  
Car-Dumper & Equip. Co.  
Link-Belt Co.
- Dynamos (See Generators)**
- Electric Haulage Supplies**  
Electric Service Supplies Co.
- Electrical Apparatus & Supplies**  
General Electric Co.  
Westinghouse E. & M. Co.
- Electrical Equipment (Used)**  
Chattanooga Armature Wks.  
Duquesne Elec. & Mfg. Co.  
Gregory Elec. Co.  
Miller-Owen Elec. Co.  
Power Mchry. Elec. Co.
- Elevators and Conveyors**  
Jeffrey Mfg. Co.  
Link-Belt Co.  
Montgomery Coal Washing & Mfg. Co.  
Webster Mfg. Co.
- Engineering Instruments and Supplies**  
Buff & Buff Mfg. Co.
- Engineering & Technical Books**  
McGraw-Hill Book Co., Inc.
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Nordberg Mfg. Co.  
Vulcan Iron Works
- Engines, Hoist and Haulage**  
Vulcan Iron Works
- Engines, Oil**  
Chicago Pneumatic Tool Co.  
Ingersoll-Rand Co.  
Power Manufacturing Co.
- Engines, Oil (Semi-Diesel)**  
Power Manufacturing Co.
- Engines, Steam**  
American Blower Co.  
Chicago Pneumatic Tool Co.
- Engines, Steam, Four Valve**  
Ridgway Dynamo & Eng. Co.
- Engines, Steam, Single Valve**  
Ridgway Dynamo & Eng. Co.
- Engines, Steam, Una-Flow**  
Nordberg Mfg. Co.  
Ridgway Dynamo & Eng. Co.
- Fans, Ventilating**  
American Blower Co.  
Connellsville Manufacturing & Mine Supply Co.  
Jeffrey Mfg. Co.  
Vulcan Iron Works  
Westinghouse E. & M. Co.
- Fittings, Wire Rope**  
(See Rope Wire)
- Floodlights, Portable**  
General Electric Co.
- Furnaces**  
Combustion Engrg. Corp.
- Gage Cocks**  
Ohio Brass Co.
- Gages, Water, Boiler and Locomotive**  
Ohio Brass Co.
- Gear Cases**  
Electric Service Supplies Co.  
Fawcuss Machine Co.  
Foote Bros. Gear & Mch. Co.  
James Mfg. Co., D. O.  
Medart Co.  
Nuttall Co., R. D.  
Tool Steel Gear & Pinion Co.  
Westinghouse E. & M. Co.
- Gears**  
Foote Bros. Gear & Mch. Co.  
Vulcan Iron Works
- Gears, Herringbone**  
Foote Bros. Gear & Mch. Co.  
Nuttall Co., R. D.
- Gears, Speed Reducing**  
Foote Bros. Gear & Mch. Co.  
James Mfg. Co., D. O.
- Gears, Worm Speed-Reducing**  
De Laval Steam Turbine Co.
- Generators, A.C. & D.C.**  
Ridgway Dynamo & Eng. Co.
- Generators and Generating Units**  
Allis-Chalmers Mfg. Co.  
General Electric Co.  
Ridgway Dynamo & Eng. Co.  
Westinghouse E. & M. Co.
- Grates, Traveling**  
Combustion Eng'g Corp.
- Greases**  
Hulburt Oil & Grease Co.  
Ohio Grease Co.  
Sanford-Day Iron Works  
Waverly Oil Works Co.
- Grinders, Portable**  
Chicago Pneumatic Tool Co.  
Railway Track-work Co.
- Hammers, Power**  
Little Giant Co.  
Sullivan Machinery Co.
- Hangers (See Runways)**
- Headlights, Arc & Incandescent**  
Ohio Brass Co.
- Headlights, Locomotive**  
Electric Service Supplies Co.  
General Electric Co.  
Westinghouse E. & M. Co.
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Combustion Engrg. Corp.
- Hitchings, Mine Car**  
Pgh. Knife & Forge Co.
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Flory Mfg. Co., S.  
Hoists, Dock  
Lidgerwood Mfg. Co.
- Hoists, Electric**  
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Connellsville Manufacturing & Mine Supply Co.
- Lidgerwood Mfg. Co.**  
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Nordberg Mfg. Co.  
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Sullivan Machinery Co.  
Thomas Elevator Co.  
Treadwell Engineering Co.  
Vulcan Iron Works
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Hulburt Oil & Grease Co.
- Hoists, Mine, Steam & Electric**  
Treadwell Engineering Co.
- Hoists, Portable**  
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Ingersoll-Rand Co.  
Sullivan Machinery Co.
- Hoists, Room**  
Treadwell Engineering Co.
- Hoists, Steam**  
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Connellsville Manufacturing & Mine Supply Co.  
Lidgerwood Mfg. Co.  
Nordberg Mfg. Co.  
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Sullivan Machinery Co.  
Thomas Elevator Co.  
Vulcan Iron Works
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Chicago Pneumatic Tool Co.  
U. S. Rubber Co.
- Hose, Fire**  
U. S. Rubber Co.
- Hose, Steam**  
U. S. Rubber Co.
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Sanford-Day Iron Works
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Jeffrey Mfg. Co.  
Link-Belt Co.  
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Webster Mfg. Co.
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Joy Machine Co.
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Porter Co., H. K.  
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General Electric Co.  
Goodman Mfg. Co.  
Jeffrey Mfg. Co.  
Vulcan Iron Works  
Westinghouse E. & M. Co.
- Locomotives, Gasoline**  
Fate-Root-Heath Co.  
Vulcan Iron Works  
Whitcomb Co., Geo. D.
- Locomotives, Geared**  
Lima Locomotive Wks. Inc.
- Locomotive, Steam**  
Lima Locomotive Wks. Inc.  
Porter Co., H. K.  
Vulcan Iron Works
- Locomotives, Storage Battery**  
Atlas Car & Mfg. Co.  
General Electric Co.  
Goodman Mfg. Co.  
Ironton Engine Co.  
Jeffrey Mfg. Co.  
Mancha, Storage Battery Locomotive Co.  
Vulcan Iron Works  
Westinghouse E. & M. Co.  
Whitcomb Co., Geo. D.
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Hulburt Oil & Grease Co.  
Waverly Oil Works Co.
- Lubricators**  
Hulburt Oil & Grease Co.  
Lunkenheimer Co.  
Waverly Oil Works Co.



**Machinery, Special**  
Vulcan Iron Works

**Mine Timbers, Steel**  
Carnegie Steel Co.

**Mining Machines**  
Goodman Mfg. Co.  
Jeffrey Mfg. Co.  
Sullivan Machinery Co.

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Goodman Mfg. Co.

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Waverly Oil Works Co.

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Harrington & King Perforating Co.

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Webster Mfg. Co.

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Ryerson & Son, Inc., Jos. T.

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Toledo Pipe Thread Mch. Co.  
Treadwell Engineering Co.

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Abendroth & Root Mfg. Co.

**Pipe, Wood**  
Standard Wood Pipe Co.  
Wyckoff & Son Co., A.

**Plates, Steel**  
Carnegie Steel Co.  
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American Coal Cleaning Corp.

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Foote Bros. Gear & Mch. Co.  
Jeffrey Mfg. Co.

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General Electric Co.  
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Medart Co.  
Skayef Ball Bearing Co.

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Raymond Bros. Impact Pulverizer Co.  
Sturtevant Mill Co.

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Raymond Bros. Impact Pulverizer Co.  
Sturtevant Mill Co.

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Barrett, Haentjens & Co.  
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Deming Co.

**Pumps, Centrifugal**  
Allis-Chalmers Mfg. Co.  
Barrett, Haentjens & Co.  
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Columbus Gear & Pump Co.  
De Laval Steam Turbine Co.

**Pumps Electric Power**  
Columbus Gear & Pump Co.

**Pumps, Pneumatic Air Lift**  
Chicago Pneumatic Tool Co.  
Ingersoll-Rand Co.  
Sullivan Machinery Co.

**Pumps, Power**  
Deming Co.  
Fairmont Mining Mchry. Co.

**Pumps, Steam**  
(See Pumps, Boiler Feed)

**Pumps, Vacuum**  
Chicago Pneumatic Tool Co.  
Columbus Gear & Pump Co.  
Ingersoll-Rand Co.  
Sullivan Machinery Co.

**Rail Bonds**  
Electric Service Supplies Co.  
General Electric Co.  
Ohio Brass Co.  
Rail Welding & Bonding Co.

**Rail Bracers**  
Foster Co., L. B.

**Rails and Rail Joints**  
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Foster Co., L. B.  
Green Railway Equip. Co., L. A.

**Rail Joints**  
Koppel Industrial Car & Equip. Co.  
Ryerson & Son, Inc., Jos. T.  
U. S. Rail Co.  
West Virginia Rail Co.

**Roller Bearings**  
(See Bearings, Ball & Roller)

**Rope, Wire**  
Leschen & Sons Rope Co., A.  
Roebbing's Sons Co., J. A.  
Ryerson & Son, Inc., Jos. T.

**Safety Appliances**  
Mining Safety Device Co.

**Scales**  
Streeter Amet Weighing & Recording Co.

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**Scraper Loaders**  
Diamond Machine Co.  
Goodman Mfg. Co.

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Deister Concentrator Co.  
Diamond Manufacturing Co.  
Fairmont Mining Mchry. Co.  
Harrington & King Perforating Co.  
Hendrick Mfg. Co.  
Jeffrey Mfg. Co.

**Link-Belt Co.**  
Marion Mch. F. & S. Co.  
Montgomery Coal Washing & Mfg. Co.

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Deister Concentrator Co.

**Second-Hand Equipment (See Searchlight Section)**

**Archer Armstrong, Inc.**  
Bridell Co., Inc., W. C.  
Chuse Engine & Mfg. Co.  
Cohen & Son Co., L.

**Duquesne Electric Mfg. Co.**  
Foster Co., L. B.  
Frank, M. F.

**Green Railway Equip. Co., L. A.**  
Gregory Electric Co.  
Greenspons Sons Iron & Steel Co., Jos.

**Hyman-Michaels Co.**  
Lindheimer, S. W.  
Miller-Owen Electric Co.

**Moorhead Elec. Mchry. Co.**  
Morrison & Reisman Co.  
Nashville Industrial Corp.  
Pgh. Boiler Machine Co.

**Power Machinery Ex. Inc.**  
Shapes, Structural Steel  
Carnegie Steel Co.

**Sheaves and Rollers**  
Fairmont Mining Mchry. Co.  
Medart Co.

**Sanford-Day Iron Works**  
Vulcan Iron Works

**Shoring, Rails for Mines**  
Foster Co., L. B.

**Signal Systems**  
Electric Service Supplies Co.

**Speed Reducers**  
Foote Bros. Gear & Mch. Co.

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Ohio Brass Co.

**Sprocket Wheels**  
Caldwell Co., Inc., W. E.  
Jeffrey Mfg. Co.

**Link-Belt Co.**  
Medart Co.  
Morse Chain Co.  
Ohio Brass Co.  
Webster Mfg. Co.

**Starters, Motor**  
Automatic Reclosing Circuit Breaker Co.

**Stocks, Dies, Vises**  
Toledo Pipe Thread Mch. Co.

**Stokers, Hand**  
Combustion Eng'g Corp.

**Stokers, Mechanical**  
Babcock & Wilcox Co.  
Combustion Eng'g Corp.

**Storage Batteries**  
Electric Storage Battery Co.

**Surveying Instruments (See Engineering Instruments)**

**Switchboards, Power**  
General Electric Co.  
Westinghouse E. & M. Co.

**Switches, Frogs & Crossings**  
Bethlehem Steel Co.  
Central Frog & Switch Co.  
Cinti. Frog & Switch Co.  
Egyptian Iron Works  
Foster Co., L. B.  
Green Railway Equip. Co., L. A.

**Helmick Foundry-Mch. Co.**

**Koppel Industrial Car & Equip. Co.**  
Sweet's Steel Co.  
Weir Frog Co.

**Tables, Coal Washing**  
Deister Concentrator Co.  
Deister Machine Co.

**Tanks, Wood and Steel**  
Caldwell Co., Inc., W. E.

**Tape, Friction**  
U. S. Rubber Co.

**Tapes, Insulating**  
Okonite Co., The

**Tape, Splicing Compound**  
U. S. Rubber Co.

**Telephone Equipment**  
Paragon Electric Co.  
Rome Wire Co.

**Telephones, Mine**  
Electric Service Supplies Co.

**Testing Laboratories (See Consulting Engrs. Directory)**

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Automatic Reclosing Circuit Breaker Co.

**Ties, Steel**  
Carnegie Steel Co.  
Fairmont Mining Mchry. Co.

**Koppel Industrial Car & Equip. Co.**  
Sweet's Steel Co.

**Tipplies and Tipple Equip.**  
Bartlett & Snow Co., C. O.  
Fairmont Mining Mchry. Co.  
Jeffrey Mfg. Co.

**Link-Belt Co.**  
Marion Mch. F. & S. Co.  
Phillips M. & M. Supply Co.  
Roberts & Schaefer Co.  
Webster Mfg. Co.

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U. S. Rubber Co.

**Towers, Water**  
Caldwell Co., Inc., W. E.

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Cinti. Frog & Switch Co.  
Egyptian Iron Works  
Foster Co., L. B.

**Koppel Industrial Car & Equip. Co.**  
Lorain Steel Co.

**Tramways, Aerial (See Aerial Tramways)**

**Transformers**  
Foote Bros. Gear & Mch. Co.  
General Electric Co.  
Westinghouse E. & M. Co.

**Trolley Material, Overhead**  
Electric Railway Equip. Co.  
Electric Service Supplies Co.  
General Electric Co.

**Ohio Brass Co.**  
Westinghouse E. & M. Co.

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Electric Railway Equip. Co.  
Nuttall Co., R. D.

**Ohio Brass Co.**  
Trolley Wheels and Harps  
Electric Railway Equip. Co.  
Nuttall Co., R. D.

**Ohio Brass Co.**  
Trolley Wire  
Anaconda Copper Mining Co.  
Roebbing's Sons Co., J. A.

**Trucks, Hollow Axle**  
Southern Wheel Co.

**Tubes, Boiler (See Boiler Water Tubes)**

**Turbines, Steam**  
Allis-Chalmers Mfg. Co.  
Barrett, Haentjens & Co.  
DeLaval Steam Turbine Co.

**General Electric Co.**  
Ridgway Dynamo & Eng. Co.  
Westinghouse E. & M. Co.

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U. S. Rubber Co.

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Lunkenheimer Co.

**Valves, Rubber Pump**  
U. S. Rubber Co.

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Deister Machine Co.  
France-Focquet A.

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Webster Mfg. Co.

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Lunkenheimer Co.

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Weber Engineering Co.

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**Weight Recorders, Automatic**  
Streeter Amet Weighing & Recording Co.

**Welders**  
Rail Welding & Bonding Co.

**Welders, Electric, Portable**  
Rail Bond  
Ohio Brass Co.

**Railway Track-work Co.**  
Rail Welding & Bonding Co.

**Welders, Rail Joint**  
Ohio Brass Co.

**Railway Track-work Co.**  
Rail Welding & Bonding Co.

**Welding Apparatus**  
General Electric Co.

**Ohio Brass Co.**  
Railway Track-work Co.  
Rail Welding & Bonding Co.

**Welding Electrodes**  
Railway Track-work Co.  
Rail Welding & Bonding Co.

**Wheels, Car (See Cars and Car Wheels)**

**Wheels, Steel**  
Carnegie Steel Co.

**Wire and Cable**  
American Steel & Wire Co.  
Anaconda Copper Mining Co.  
General Electric Co.

**Interstate Equipment Corp.**  
Leschen & Sons Rope Co., A.  
Paragon Electric Co.  
Roebbing's Sons Co., J. A.  
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Simplex Wire & Cable Co.

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**Wire, Insulated**  
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**Wire, Trolley (See Trolley Wire)**

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THREADING and CUTTING JOBS

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Cement Gun Work

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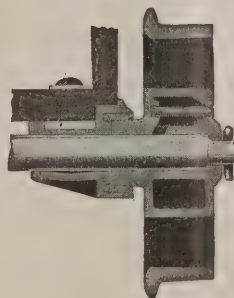
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Is seldom shopped on account of truck trouble.

Holds lubricant for long periods.

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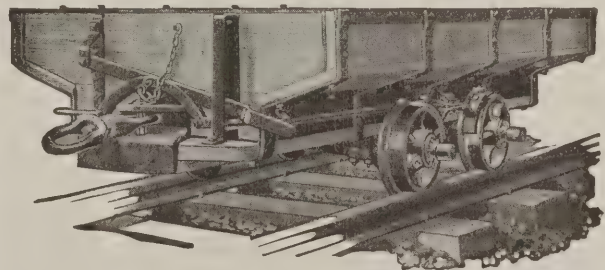
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*The Little Giant  
Electric Coal Drill*

Completely described in Bulletin 895—the booklet that will help place your production on a basis similar to those described. Write for your copy.

*The Little Giant Electric  
Coal Drill and Mounting.*

## Crowd Development —and Increase Production

**A**T THE Illinois operation shown above nine No. 472 Reversible Little Giant Mounted Electric Coal Drills are in continuous use in driving entries and cross-cuts from entries. One drill is assigned to a seven-man gang, consisting of five loaders, one chain-machine runner and one driller. The earnings are pooled and divided equally. Since installation these men now earn in ten days what formerly required thirteen days' work, with a resultant increase in production of approximately thirty per cent. The rate of drilling is two feet per minute.

In a new large operation in Southern Illinois two miles of development were made in three months—a record-breaker. Chain machines were used for undercutting the coal, No. 472 Reversible Little Giant Mounted Electric Coal Drills for shothole boring, and mechanical machines were used for loading. This record was made possible by the use of Little Giant Coal

Drills, which reduced the idle time of the chain and loading machines to a minimum. Rate of drilling, two feet per minute. One man with a drill completed nine headings, consisting of three shotholes each, in one day. All drills used twenty-four hours (three eight-hour shifts) continuously with but slight maintenance cost.

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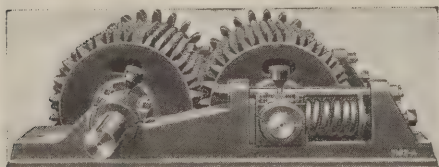
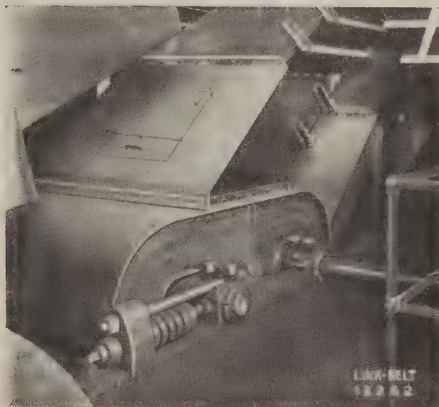
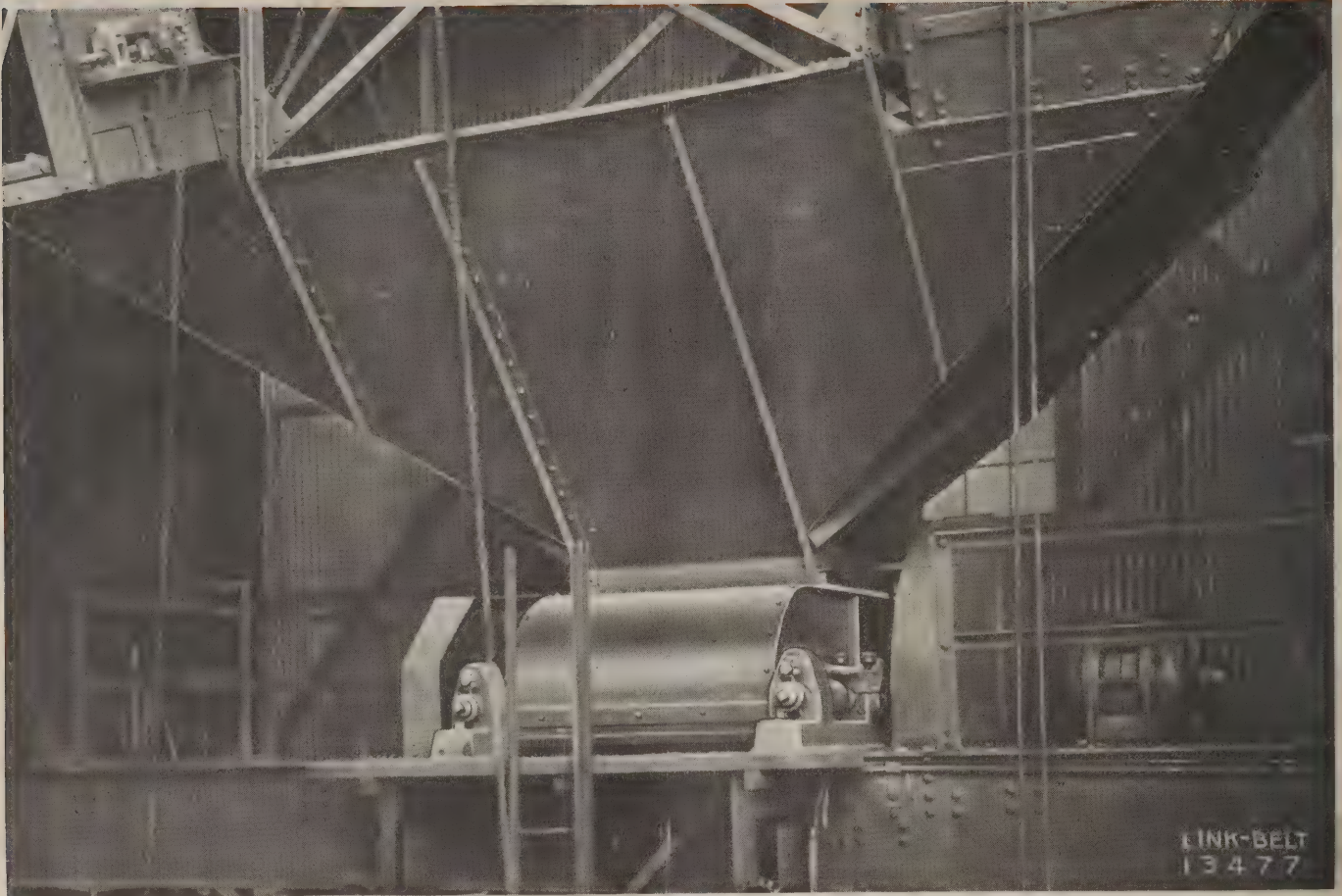
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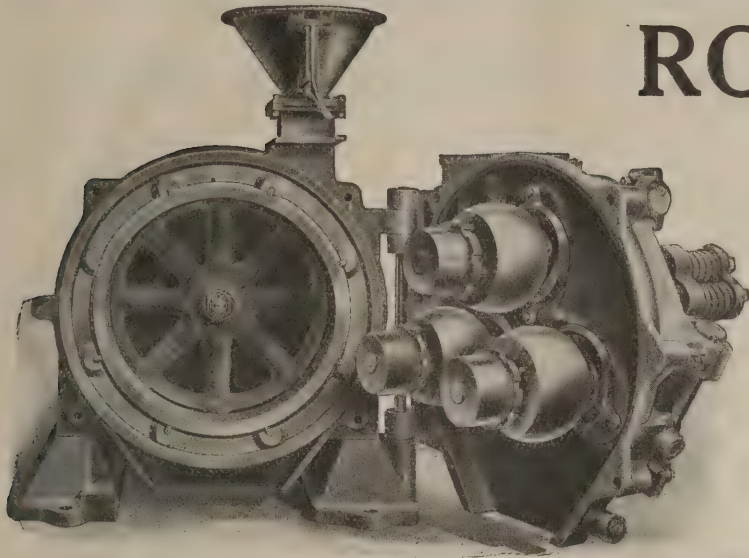
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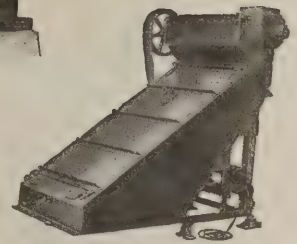




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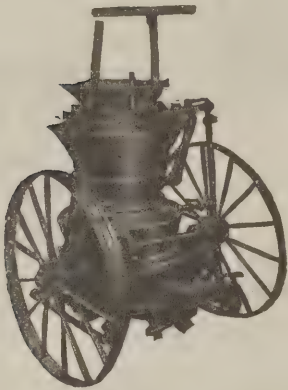


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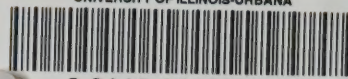








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